# The 14th Asian Conference on Psychology & the Behavioral Sciences (ACP2024)

## The 2024 IAFOR Spring Conference Series in Tokyo

March 25-29, 2024 | Tokyo, Japan



# OFFICIAL CONFERENCE PROCEEDINGS

ISSN: 2187-4743

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The Asian Conference on Psychology & the Behavioral Sciences 2024

Official Conference Proceedings

ISSN: 2187-4743

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The International Academic Forum (IAFOR)
Sakae 1-16-26-201
Naka Ward, Nagoya, Aichi
Japan 460-0008
www.iafor.org

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# *The Impact of Mentoring on Professional Development of Young Working Adults: The MentorsHub Case Study*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
The impact of mentoring on professional development is unequivocal and has been long documented in academia (Zheng, Zhao & Yuan, 2020). First, mentors provide information and skills to mentees regarding future career trajectories, options, and pathways. Second, mentors provide access into their social networks that are not otherwise formally available which further provides the mentee with opportunities for information and skills acquisition and also potential career opportunities. Third, mentors, according to Social Learning Theory (Bandura, 1977), model behaviors for mentees to follow in the workplace setting them up for further success. Hence all of these processes should result in more efficacious career-related outcomes such as compensation and job satisfaction. This study, using the MentorsHub case study (a Singapore non-profit organisation), seeks to confirm the theory of change and accompanying hypotheses by first presenting the relevant literature, before turning to the quantitative data analysis, and further following up with qualitative data analysis from Focus Group Discussions conducted. The impact of mentoring is tested using through Hypothesis 1: MentorsHub has had a positive impact on the personal and professional development of participants and Hypothesis 2: MentorsHub has aligned the professional and life goals of participants to be consistent with their inherent talents and strengths. Given evidence from the literature review, quantitative analysis, and qualitative analysis, the hypotheses are correct that MentorsHub has had a positive impact on the professional and personal development of mentees and aligns their internal values and strengths with their personal and career goals through mentoring, coaching and workshops.

Keywords: Mentoring, Professional Development, Personal Development, Coaching and Career

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## Introduction

MentorsHub Ltd has a team of over 50 PMET Mentors that provide voluntary mentoring programs to undergraduates and young working adults from the ages of 21 to 26. Priorities are given to Singaporeans and PRs from low-to-mid income or single parent families, the underserved and the minority groups. Besides a one-year long mentoring cycle where each mentor meets the mentee for at least 6 mentoring sessions, MentorsHub also provides at least 5 workshops per year to each mentee in areas of uncovering their life purpose, building their strengths, preparing their CV, elevating their first 100 days on the job, developing and enhancing their personal brand and also, engaging them in networking opportunities.

## Objective

This report seeks to confirm the theory of change and accompanying hypotheses by first presenting the relevant literature, before turning to the quantitative data analysis, and further following up with qualitative data analysis from Focus Group Discussions conducted.

Hypothesis 1: MentorsHub has had a positive impact on the personal and professional development of participants

Hypothesis 2: MentorsHub has aligned the professional and life goals of participants to be consistent with their inherent values and strengths

### *Professional Development*

The impact of mentoring on professional development is unequivocal and has been long documented in academia (Hunt and Michael 1983). There are a variety of ways in which mentoring supports professional development. First, mentors provide information and skills to mentees regarding future career trajectories, options, and pathways. Second, mentors provide access into their social networks that are not otherwise formally available which further provides the mentee with further opportunities for information and skills acquisition but also potential career opportunities. Third, mentors, according to social learning theory, model behaviors for mentees to follow in the workplace setting them up for further success. Hence all of these processes should thus result in more efficacious career-related outcomes such as compensation and job satisfaction.

A keystone study published by Allen et. al in 2004 provides significant evidence for the positive effect of mentoring on professional development. First studying the impact of mentoring on mentees' reported outcomes, performing a meta-analysis on studies comparing mentored and non-mentored groups, they found that in terms of objective outcomes such as compensation and numbers of promotions, mentored individuals were likely to have higher compensation and more promotions compared to non-mentored individuals. On subjective-related outcomes, mentored individuals were more satisfied with their career, more likely to believe that they would advance in their career, and more likely to be committed to their career compared to their non-mentored counterparts.

Second, studying the relationship between career mentoring and outcomes, they find similar evidence that more career mentoring is related to greater compensation, salary growth, and more promotions. For subjective outcomes, there was greater career satisfaction and job satisfaction. Third, analyzing studies that focused on the linkages between role-modeling and career outcomes, they found that role-modeling led to greater compensation, promotions, career and job satisfaction (Allen et al. 2004). To provide a taste of the extent to which how mentoring improves objective outcomes, a study compiled by the HR department of Sun Microsystems focusing on 1,000 employees over a 5-year period found that both

mentors and mentees were approximately 20% more likely to get a raise than people who did not participate and mentees were promoted five times more likely to be promoted than the non-mentored (Quast 2011). Thus, it is likely that MentorsHub did have a positive impact on the professional development of mentees.

### *Personal Development*

There are very little studies focusing on the relationship between personal development and mentoring. This could be partially attributable to the generally untestable nature of such a relationship, however, there are a spate of studies from a literature review by Jennifer Diziczkowski that, through mostly anecdotal evidence, uncovered benefits such as: 1) improved self-esteem, 2) increased insight, 3) reduced stress and anxiety and 4) greater awareness of different approaches (Dziczkowski 2013). Hence, it would seem that mentoring should have a positive impact on personal growth.

### *Theory of Change*

A theory of change seeks to explain the impact an organization has had by breaking down the elements into inputs, outputs, outcomes, and the assumptions/hypotheses by which the inputs achieves such outcomes. Below, in Figure 1, the theory of change for MentorsHub for this report following the National Youth Council's Programme Logic Model (National Youth Council Singapore, n.d.).

| Inputs/ resources | Activities | Assumptions & Hypotheses | Outputs | Short-term outcomes | Intermediate outcomes | Long-term outcomes |
|---|---|---|---|---|---|---|
| Mentorship<br><br>Trainers/Speakers<br><br>Funding<br><br>Coaches | Career workshops<br>a. Achieving personal effectiveness in the workplace<br>b. Navigating office politics<br>c. Establishing meaningful connection<br>d. Developing leadership qualities<br><br>Networking opportunities (ACCELERATE)<br><br>1. Mentoring Retreat – discovering and unleashing your potential<br>2. Mentorships<br>3. Strengths and life coaching<br>4. Personal branding<br>5. Acing the interview/Growth mindset<br>6. Supercharge your first 100 days at work | 1. MentorsHub has had a positive impact on the personal and professional development of participants<br>2. MentorsHub has aligned the professional and life goals of participants to be consistent with their talents and strengths | Youth participants who have a clearer and positive outlook on life and are prepped to succeed professionally | 1. Better understanding of your skills and qualities, and how to leverage them, Ability to better align your personal and professional goals, more confidence in pursuing your goals with a practical gameplan (Key ASPIRE Outcomes)<br>2. Higher level of professional and practical skills for the workplace, widening of your network and opportunities, more confidence in handling unexpected or unknown scenarios at work (Key Accelerate outcomes) | 1. Tenacity, Confidence (Driven)<br>2. Proactiveness, Growth Mindset (Resilient)<br>3. Career Preparedness (Competitive)<br>4. Greater realization of internal strengths and weaknesses and aligning professional and life goals with candidate characteristics | 1. Driven & resilient<br>2. Competent & Collaborative<br>3. Candidates face greater life fulfilment due to personal alignment of internal strengths |

*Figure 1: Theory of Change*

## Results and Findings

### 1. Mentoring Retreat Data

From the data, insights, as listed below, can be analyzed:

a. Workshop rating
b. To recommend to friends
c. Knowledge application
d. Process indicators
e. Sentiment analysis
f. Year-by-year comparison

## 2. Mentees' Progress Evaluation (MPE) Report

The MPE is an evaluation of every mentee conducted by the management at the end of every mentoring cycle to understand 1) where and how the mentorship has helped the mentee and 2) what could be further improved on. The mentorship cycle is then officially closed, except for those who request to extend.

Most of the data provided from 2016 to 2021 is presented in comments form. Thematic analysis can be applied from 2018 to 2020, only summary-level data is presented. 2022 contains key variables that can test the hypotheses.

### Mentoring Retreat Data Analysis

The Mentoring Retreat is a pre-mentoring preparation program conducted for the mentees by MentorsHub. It provides participants with a safe, shared space to discover new insights about themselves. Through the Soul-Strength-Soar workshops, mentees are led through a process to personal vision casting and career goals setting.

Data where candidates were asked to rate their agreeableness on a scale of 1 to 5 with the following statements: (1) "The knowledge I gained from this workshop is applicable to my personal development", and (2) "I know how to apply what I have learned to help me meet my goals", is analyzed in this section.

#### *Data From 2019 Cohort*

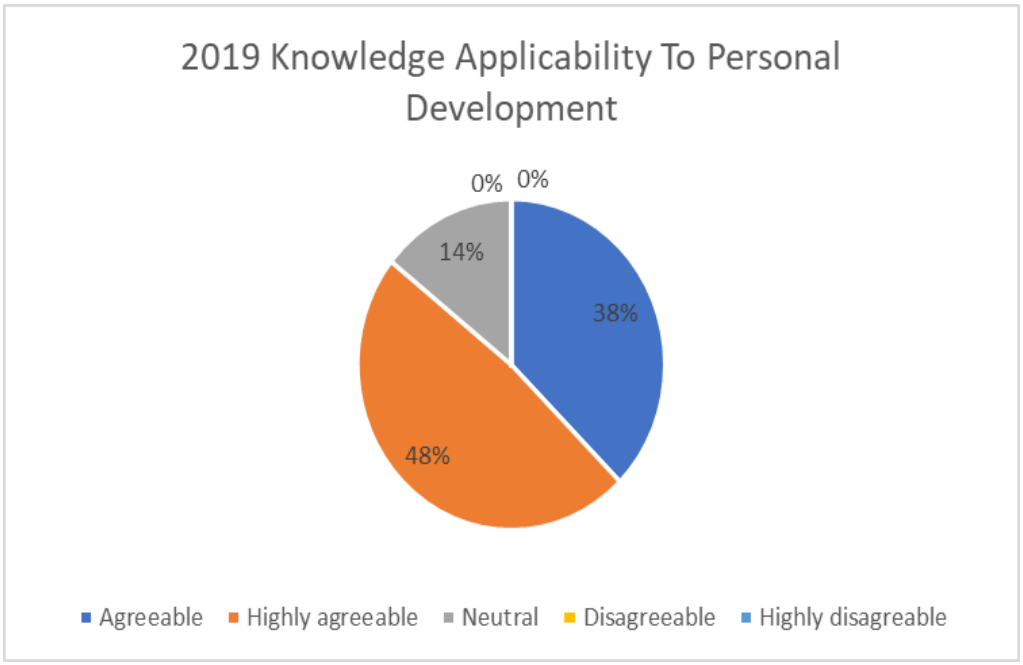



*Figure 2: Applicability of knowledge to personal goals (2019)*

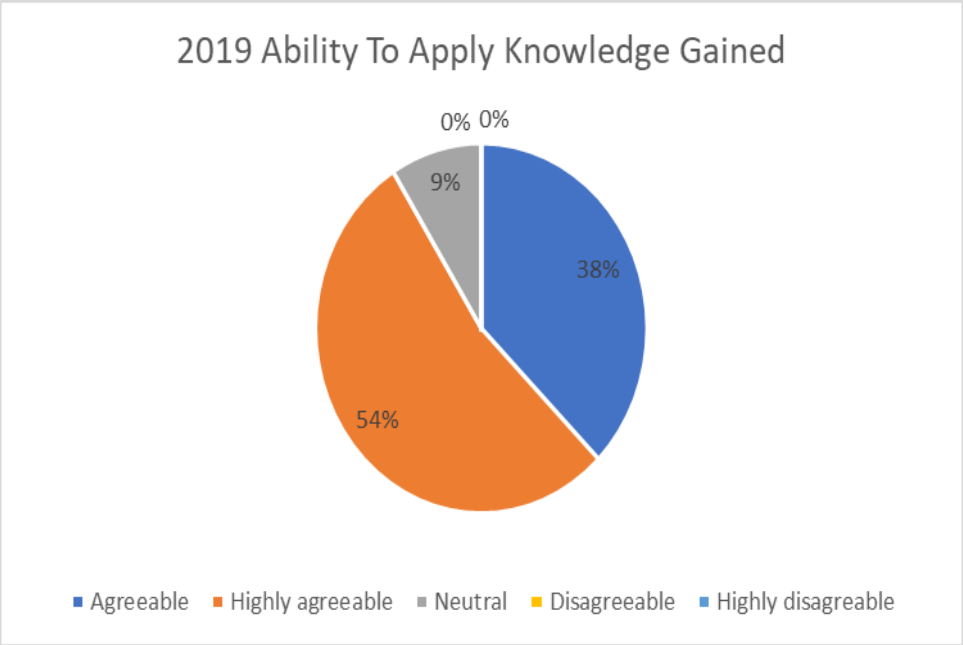



*Figure 3: Ability to apply knowledge gained (2019)*

92% reported ability to apply the knowledge gained, and 86% agreed that they were able to apply the knowledge gained to their personal lives.

***Data From 2020 Cohort***

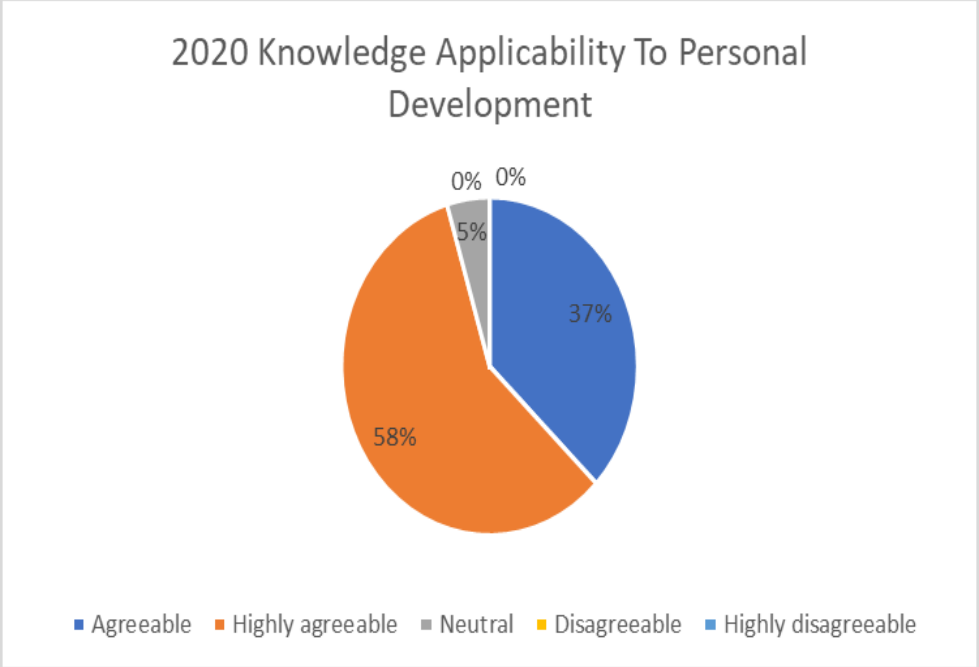



*Figure 4: Applicability of knowledge to personal goals (2020)*

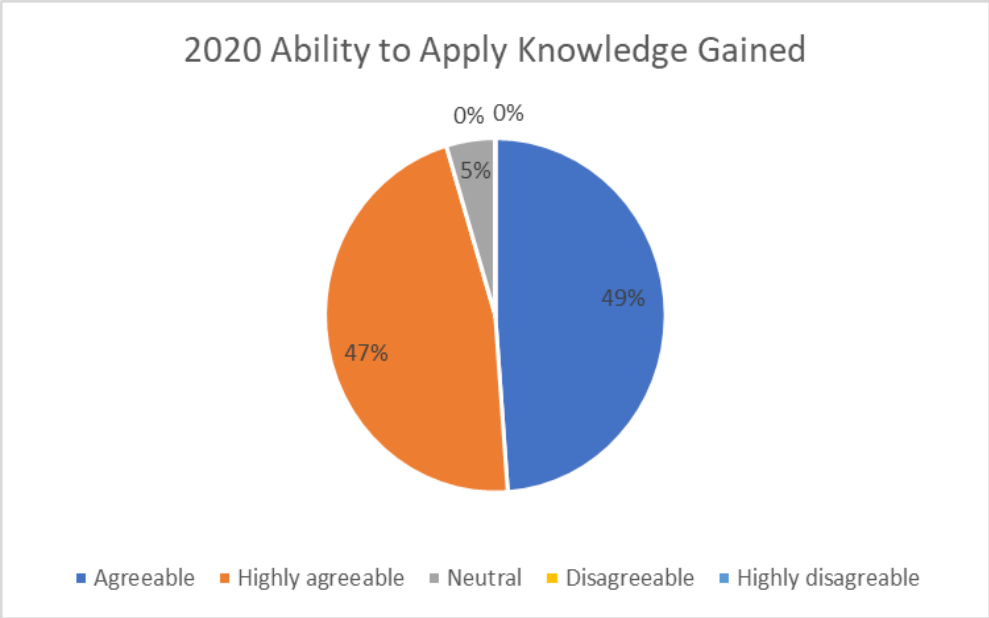



*Figure 5: Ability to apply knowledge gained (2020)*

Compared to 2019, 4% more participants reported ability in applying the knowledge gained, and 9% more reported greater applicability of knowledge to their personal lives.

***Data From 2021 Cohort***

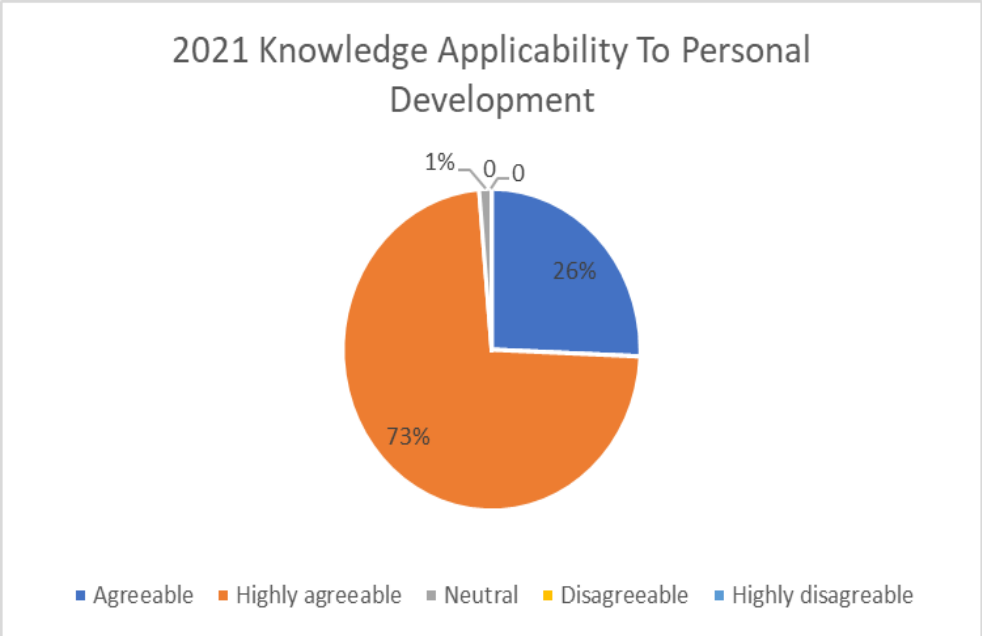



*Figure 6: Applicability of knowledge to personal goals (2021)*

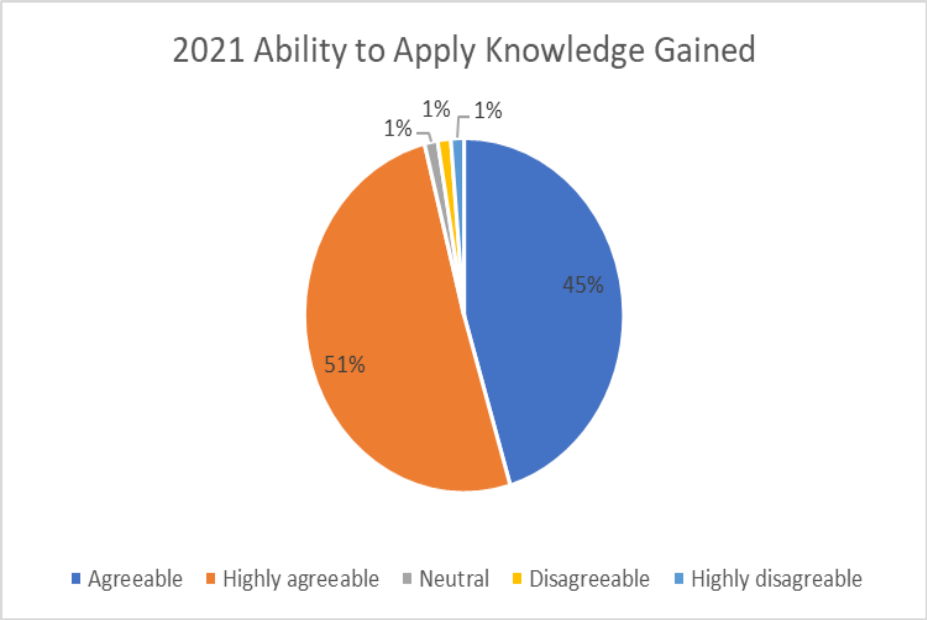



*Figure 7: Ability to apply knowledge gained (2021)*

2021 saw an equally strong response with 96% of the participants reporting ability to apply knowledge gained, and an almost perfect knowledge applicability to their personal development.

Overall, MentorsHub has improved the relevance of the knowledge provided to mentees. The percentage of mentees reporting perfect applicability of knowledge to their personal development increased from 54% in 2019 to 73% in 2021. Mentees scoring '4' decreased from 38% to 26%, furthermore mentees scoring '3' decreased from 9% to 1% from 2021 to 2019.

The applicability of such knowledge to mentees' personal lives also saw improvement. The percentage of mentees reporting perfect scores increased from 48% to 52% from 2019 to 2021. Percentage of mentees reporting '4' increased from 38% to 47% while those reporting '3' decreased from 14% to 1%. Though MentorsHub has improved the overall applicability of such knowledge as the percentage of mentees reporting '3' decreased and '5' increased, however the percentage reporting '4' increased as well. All in all, MentorsHub has succeeded in not just providing increasingly relevant content, but has also enabled mentees to utilize such knowledge effectively.

***Mentees Progress Evaluation (MPE)***

The MPE is an evaluation conducted by the management of every mentee at the end of every mentoring cycle to understand 1) where and how the mentorship has helped the mentee and 2) what could be further improved on. The mentorship cycle is then officially closed, except for those who request to extend.

***Data From 2022 Cohort***

To further understand how MentorsHub has impacted the mentees on their professional and personal fronts, additional questions were asked to the 2022 cohort. Here are the findings:

## *1. Professional Development*

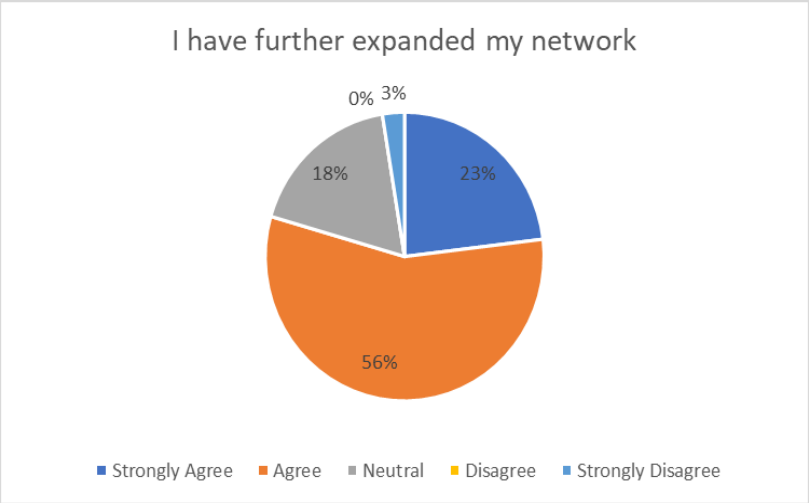



*Figure 8: Networking impact (2022)*

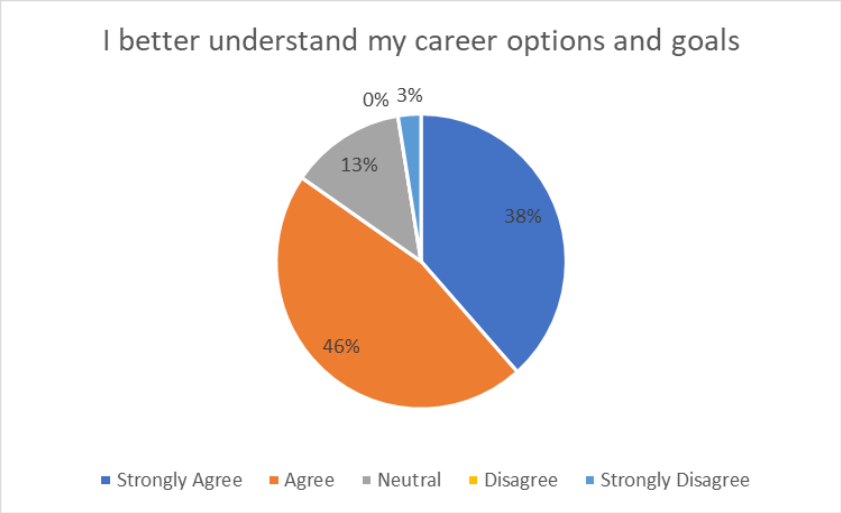



*Figure 9: Career landscaping (2022)*

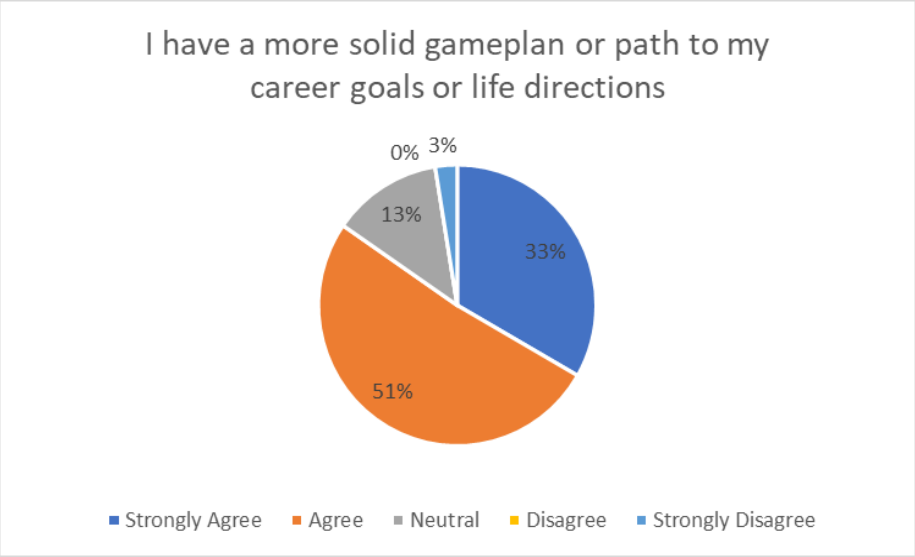



*Figure 10: Career planning (2022)*

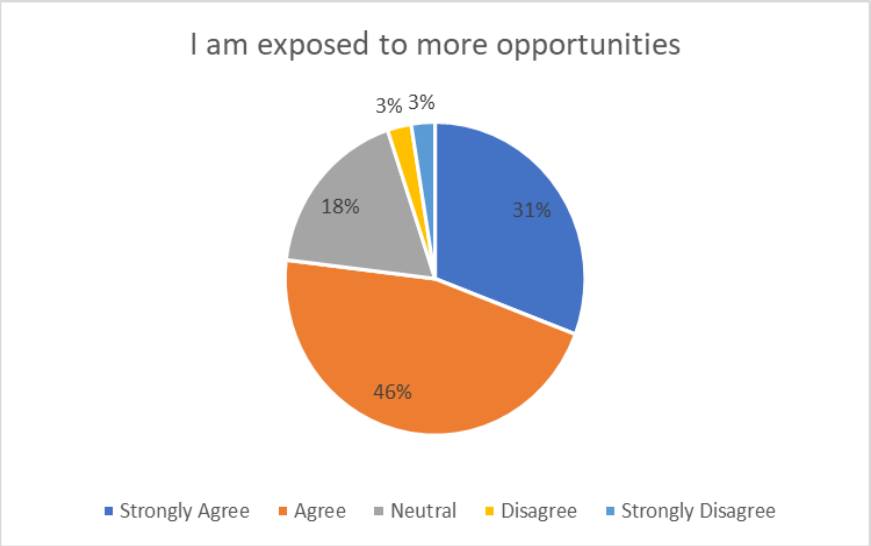



*Figure 11: Opportunity exposure (2022)*

Within the professional development section, under networking, career optionality, career trajectory, and opportunities, more than 75% of the participants agreed or strongly agreed that MentorsHub had impacted their lives positively in these areas. While 18% were neutral and about 5% disagreed or strongly disagreed. By and large, this confirms the hypotheses that MentorsHub has had a positive impact on the mentees' professional development.

### *2. Personal Development*

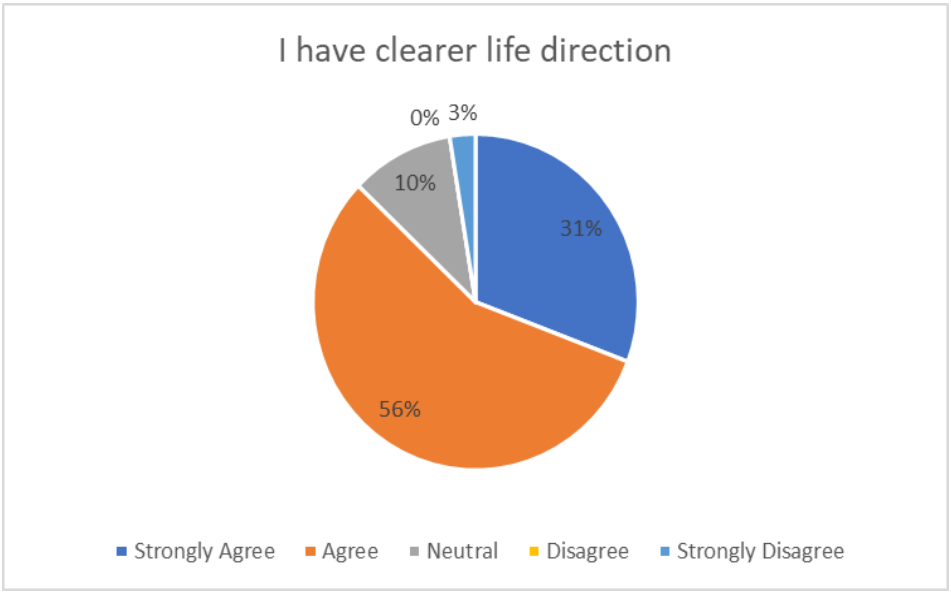



*Figure 12: Life clarity (2022)*

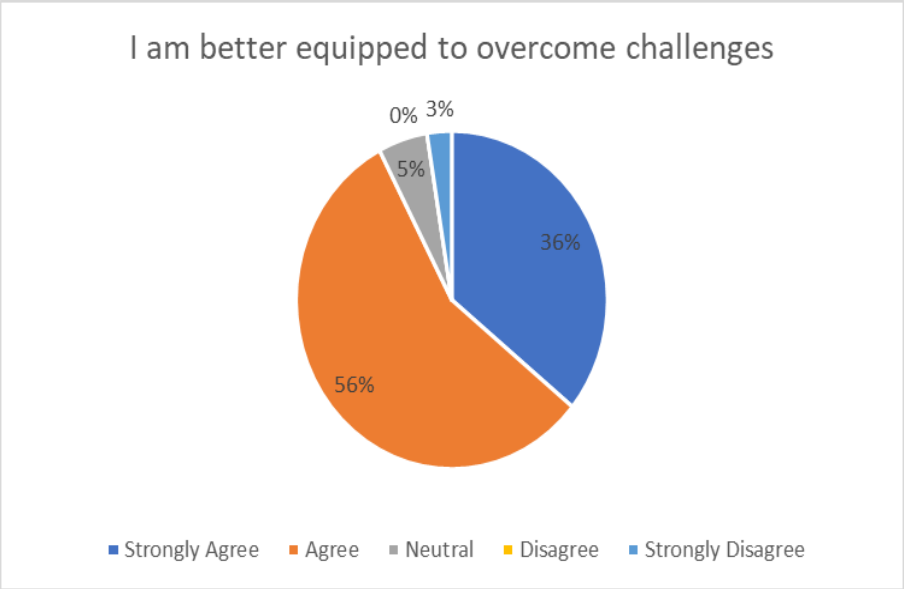



*Figure 13: Resilience (2022)*

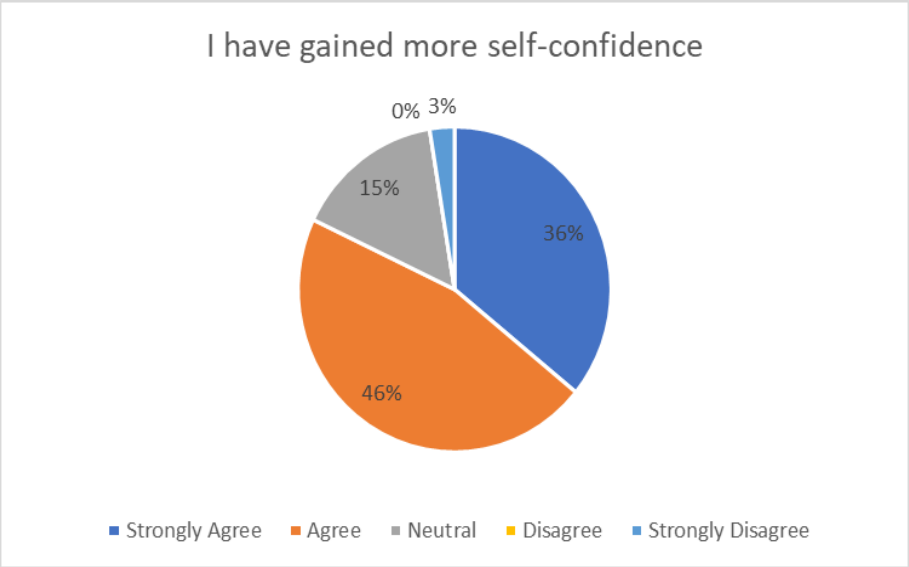



*Figure 14: Self-confidence (2022)*

Along areas of greater life clarity, confidence, and resilience, between 80% - 90% agreed that MentorsHub has positively impacted their professional development. A significant portion between 30% - 40% strongly agreed on the impact MentorsHub has on such areas while about 5% to 15% remained neutral, and 3% disagreed on any impact. By and large, such results confirmed the hypothesis that MentorsHub has had a positive impact on the personal development of the mentees.

MentorsHub has had a positive impact on the personal development of mentees, with 80-90% of mentees agreeing that it has helped them to achieve greater life clarity, confidence, and resilience. A significant portion of mentees (30-40%) strongly agreed with this sentiment, while only 5-15% remained neutral, and 3% disagreed. These results provide strong evidence to support the hypothesis that MentorsHub is an effective program for personal development.

## Qualitative Analysis and Results

### *Professional Growth*

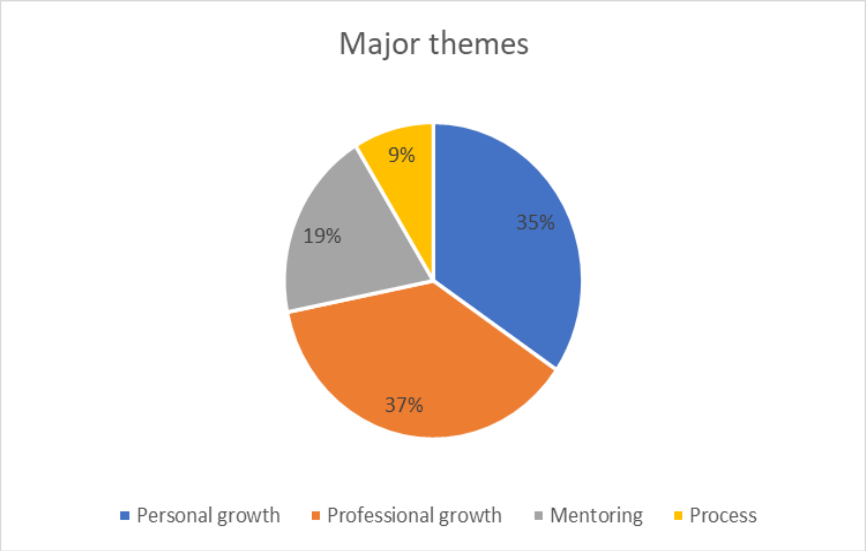



*Figure 15: Theme breakdown*

The largest theme identified, as in Figure 15, was professional growth at 94, with the second largest being personal growth at 87. Such results are a direct confirmation of the hypotheses as participants spoke to how the mentoring programs directly affected their professional and personal lives and how MentorsHub aligned their professional and life goals to be consistent with their inherent values and strengths.

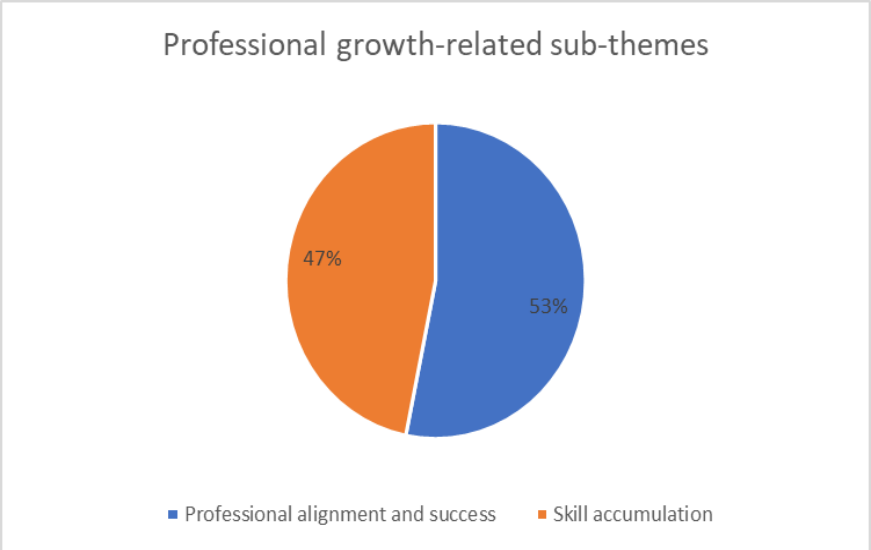



*Figure 16: Professional sub-themes*

In confirmation of hypothesis 2, the largest sub-theme identified within professional growth, as in Figure 16, was professional alignment and success. The sub-theme tracks mostly ideas related to greater career alignments such as career switches, career identification, career satisfaction, and having a clearer professional outlook. The best examples of such professional alignments would be career switches, of which many participants spoke to either regarding their own experience or their mentees' experience.

One such example includes one mentee moving from finance to human resources (HR): “So I came into MentorsHub with skepticism, I initially doubted myself as to whether I could really learn more. And of course I did. I think what really helped was my mentor, she managed to question some of my thoughts in a way that really broadened my perspective, intentionally and unintentionally, and that is what made me pivot from being in the finance industry to HR.”

A lot of participants also spoke to their experiences regarding identifying careers that resonated with them. One participant, Firdaus, shared their experiences how the Gallup Strengths workshop resulted in them knowing what career he wanted to pursue - “So from when I did the test from the five strengths, it seemed like sales was something I wanted to explore, it seems like a good fit, and I went in, I even had some part-time experiences doing sales as well.”

And this all resulted in not just greater career satisfaction but success as well. With regards to career satisfaction, Firdaus, who wanted to do sales, eventually realized that he did not want to do sales due to the transactional nature of the work, however after pivoting into project management, he shared - “afterwards I realized this is a better fit for me. The relationship part was really more intimate, you really get to build bonds and you get to know each individual in the team better as you work with them….” Both the increased career satisfaction and success are consistent with findings in academia as they find mentoring lead to greater success with career and are more likely to be committed to their career compared to their non-mentored counterparts (Hunt and Michael 1983).

Another shared how she experienced greater success by shifting her mindset from one of fear to one of growth resulting in “taking a role whereby I’m in the central role and I’m coordinating various departments and I have to host a meeting with the senior leaders.”

An important mechanism that resulted in such career success was both the accumulation of skills and also mindset changes. Participants shared a greater focus on soft skills, with one working in finance sharing how her mentor coached her on her presentation skills -”And so I did my homework and after presenting it to her, the mentor shared ‘ok how you should have used a different phrase because if you use high-level finance jargons, your clients may not understand you’ and so I think that really helped.”

Participants also shared the mindset changes they underwent as well. When asked how she thought her character changed, a participant who shall be called Jasmine shared “I think for me in my experience as a mentee is because my mentor does way more, her character and my character is really very different. I’m more reserved and she’s more bold, extroverted, and I think how she has helped is more of like encouraging me to step out of my comfort zone, reaching out to more people and talking to them.” Beyond extraversion, participants also mentioned gains in other areas such as leadership and within the personal sphere as well which shall be explored in the following section.

***Personal Growth***

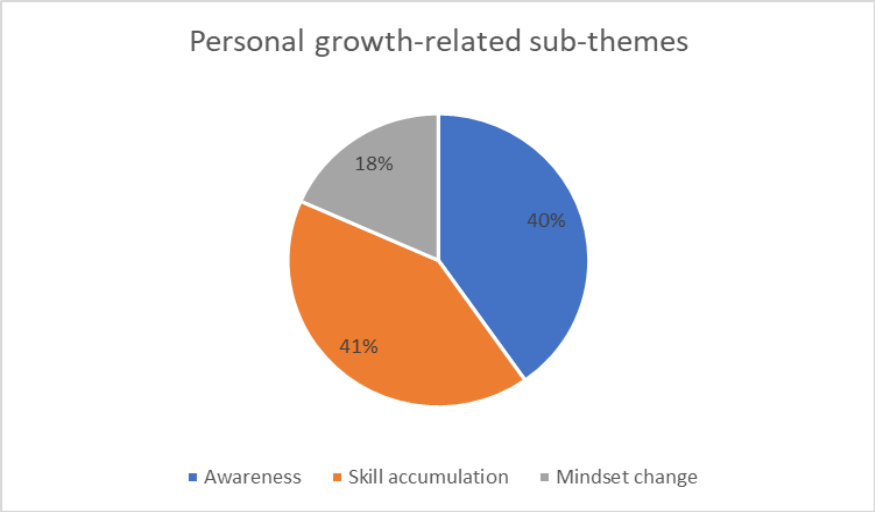



*Figure 17: Personal sub-themes*

The most significant area, as in Figure 18, is the tools that they learned from MentorsHub. One of the highest rated ideas were related to interpersonal communication with one candidate sharing that in addition to become more reflective, he also "became more assertive, so the first few sessions with the mentor, she asked me to be more vocal because I had a lot of thoughts on my head but I didn't dare or feel the need to say, she would say 'hey those are great thoughts, please share it out.'" Such confidence is also consistent with the literature as studies find that mentees reduce their stress and anxiety (Dziczkowski 2013).

A good sign of whether participants continue to carry their learnings is through checking their content and skill retention. A good indicator that former mentees and mentors brought up was how they and their mentees respectively continued to revise and relearn what they learned as marked under the robustness code. One such mentor shared that a mentee from her earliest batches would often touch base again and ask the mentor for advice on what courses to take. "And so, in terms of upskilling, it's been heartening to help them learn over their career", the mentor concluded.

Participants shared that the second most significant area where they improved the most personally was awareness of their general being. Be it being more aware of one's emotions or self or even social environment, participants shared how such awareness provided greater clarity in life. One former mentee who we shall call John and is currently working in Finance shared that - "again in the corporate world if you're in a team or want to develop soft skills in the corporate ladder, you need them in addition to the hard skill, so one of the things [I learned] at MentorsHub is being able to know different people, after a few sessions you know who they are, whether they are extroverted or introverted, and being able to know how they recharge enables you to recognize how to build relationships with them." Such a result is in line with the literature with one paper identifying greater self-insight as a result of mentoring (Dziczkowski 2013).

Participants also discussed the mindset changes that accompanied their mentorships. One of the largest mindset changes were those related to gaining broader perspectives. One former mentee shared that though "I was expecting just guidance on my professional career, but I gained far more in self-clarity."

### *Longitudinal Impact*

The impact of MentorsHub exists far beyond the short-term. For instance, in the quantitative data, many participants agreed with the statement 'I am better equipped to overcome challenges'. The ethos of such a statement was brought up during the FGDs when one participant shared that in sessions with her mentor, her mentor had urged her to focus on what could go right rather than what could go wrong and to treat every moment that does go wrong as a learning point. Many years onwards, when she was given the task to lead a core project interacting with senior management, she still carried the same intuition on focusing on what could go right rather than wrong.

Another statement which many participants agreed with in the surveys was 'I have further expanded my network'. To illustrate the impact further in the FGDs, one heartwarming story was how a past mentee who had been laid off during the height of Covid-19, at his mentors' encouragement, reached out to the broader mentor network for support to tide not only himself but also his family during hard times and was able to successfully find a new role.

Another theme touched upon in the surveys was 'I have a more solid game plan or path to my career goals or life directions'. Such a theme was fleshed out more thoroughly in the FGDs. One participant who discovered that communication was one of his strengths through the Gallup's Strengths test had thought that he would be interested in sales. A few years later he realized that sales was not for him. After redoing his test and realizing that planning was also another one of his strengths, he decided to try out for a project management role at a health-tech consulting firm. He has been satisfied with his career ever since. Given such stories of candidates being able to successfully apply what they had learned and revisited the material taught time and time again to achieve success, the longitudinal impact of MentorsHub is unequivocally positive.

### *Mentoring*

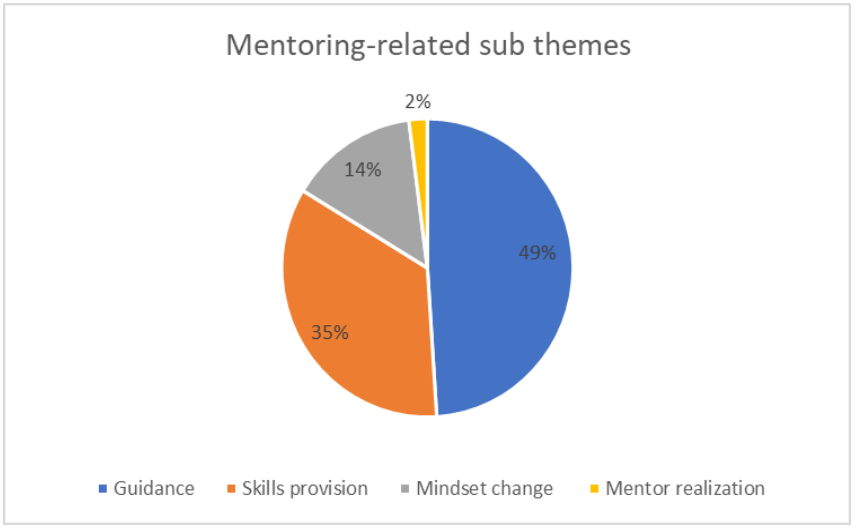



*Figure 18: Mentoring sub-themes*

A lot of participants discussed, either as mentees, the high-quality mentoring they received or, as mentors, the way in which they guided their mentees as in Figure 18. Guidance was the largest sub-theme and one of the ways mentors did this was through encouragement. One mentee who was retrenched due to Covid-19 shared how his mentor helped him through his

rough time: “he asked me to be more daring in asking for more help if you need anything and that’s when I reached out to [other] mentors and also my school to ask for support in how to recover from this.”

Skills provision was the second most identified theme with long-term planning being the most useful skill rated. One mentor shared the way she saw her mentees grow was in the way they approached life: “For me, it’s clarity, most mentees will come in being not so sure about where they want to go. So, they end the journey knowing where they are heading and what actions they want to take.”

Mindset changes within the mentees was also strongly picked-up, with a lot of participants sharing how either as mentees or mentors encouraged more proactive approaches. One participant in finance shared how her mentor encouraged her to adopt such an approach: “So previously when I mentioned earlier in the meetings I wasn’t as participative, I was always caught up with busy work and I would always be in a catch-up mindset rather than thinking ahead. So, my mentor’s advice was to work outside of your current work so that you think strategically a few steps ahead and so I was able to apply that to my current work and I was given the chance to mentor the newer employees in the current company and also to take on the central roles in certain projects.”

## Conclusion and Implications

Given evidence from the literature review, quantitative analysis, and qualitative analysis, the hypotheses are correct that MentorsHub has had a positive impact on the professional and personal development of mentees and aligns their internal values and strengths with their personal and career goals through mentoring, coaching and workshops.

It is also important to note that such impact is not just temporary but likely to be permanent. As per the longitudinal impact analysis, past mentees found themselves reverting to the principles and skills taught during their mentorships even after they had been working for more than 3 years, indicating the long-term impact of MentorsHub programs.

There is, however, much work to be done. Participants of the FGDs suggested two innovative approaches. The first was alumni-mentee pairing to tackle the issue of the at-times large age-gaps between mentors and mentees. The second was to have group sessions so that mentees can have a shared, safe space to reflect on their journeys so far.

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# *The Effectiveness of Art Therapy on Controlling Negative Behavior of Schizophrenia Patients in Bali Province*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
This study investigate the effectiveness of art therapy, specifically weaving activities in managing negative behaviors by patient diagnosed with schizophrenia. Individuals with schizophrenia tend to manifest behaviors that pose risks to themselves and others. These negative behaviors are attributed to responses such as fight and flight (escape), reaction to resistance, and immobility. The technique of weaving plaits is proposed as a therapeutic intervention to mitigate these negative behaviors. This experimental research uses a pretest-posttest control group design. The participants, comprising hospitalized individuals diagnosed with schizophrenia (n=8), were selected through a simple random sampling technique. The two groups include the experimental group (n=4) and the control group (n=4). Pre and post-measures were conducted using the Mini-Mental State Examination (MMSE) to assess the severity of psychotic symptoms and the Positive and Negative Syndrome Scale-Excited Component (PANSS-EC) to evaluate behavior control. The Mann-Whitney test analysis found a difference in behavioral control scores in the experimental and control groups with $p = 0.020$. This result shows that art therapy through weaving has proven effective in controlling negative behavior in schizophrenic patients.

Keywords: Art Therapy Intervention, Negative Behavior Control, Schizophrenia

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## Introduction

Schizophrenia is a chronic mental disorder characterized by hallucinations, delusions, disorganized thinking, grossly disorganized motor behavior, and several other negative symptoms (APA, 2013). According to current data (Ministry of Health of the Republic of Indonesia, 2018; *Riset Kesehatan Dasar* (Riskesdas 2018), the highest prevalence of schizophrenia was found in Bali area at 11.1% and Yogyakarta at 10.4% of a total of 1000 households in Indonesia Communities in the province of Bali have a vulnerability to mental disorders, especially schizophrenia (Ministry of Health of the Republic of Indonesia, 2018). The aforementioned data is corroborated by findings extracted from medical records obtained from the Bali Provincial Psychiatric Hospital in 2018. These records showed the prevalence of schizophrenia among patients, with 7,647 individuals seeking polyclinic visits, 391 receiving emergency room treatment, and 3,553 admitted to inpatient rooms. Consequently, the cumulative count of schizophrenic patients stands at 11,591 individuals (Suciati, 2019).

## The Onset of Schizophrenia

The onset of schizophrenia can be attributed to poverty, many traditional rituals, and family problems associated with inheritance (Khafifah, 2019). Schizophrenic disorder can affect individuals across a broad age range, with an onset typically observed between 15 and 55 years (Kaplan & Sadock, 2015). However, this disorder can be particularly disruptive for individuals in their productive years, where they are engaged in fulfilling developmental tasks as human beings (Sadock & Kaplan, 2015). Schizophrenia is influenced by multiple factors, encompassing genetic, biological, biochemical, socioeconomic, psychosocial, and drug abuse aspects (Sadock & Kaplan, 2015). Individuals diagnosed with schizophrenia often exhibit specific negative behaviors that pose risks to themselves and others (Martini, 2018). The manifestation of these behaviors adds complexity to the challenges faced by individuals grappling with schizophrenia. Understanding the diverse factors contributing to the emergence of schizophrenia is crucial for developing comprehensive approaches to address and manage this complex mental health condition.

## Negative Behavior of Schizophrenia

According to Rahayu (2019), negative behavior is also expressed as an attitude or ability of a person to respond to things that deviate or are not in accordance with rules and norms that have an impact on self-decrease (Rahayu, 2019). These negative behaviors can be detrimental to oneself and others such as violent behavior, criminal acts, aggressiveness, and others. Violent behavior is often accompanied by rampant behavior and uncontrolled agitation (Dermawan, 2018). In addition, people with schizophrenia also show symptoms of disorganized behavior which includes uncontrolled motor activity such as aimless movements, repetitive movements, stiff movements, aggressiveness, agitation, and inappropriate expressions (Maramis, 2009). There are identified signs and symptoms of aggressive behavior, namely red face, tension, sharp eyes, clenching hands, clenching the jaw tightly, speaking harshly with high intonation, screaming, or shouting, threats verbally or physically, throwing, hitting, damaging goods, and has no control in preventing or controlling his/her own violent behavior (Muhith, 2015). The symptoms shown will certainly affect the lives and bodies of people with schizophrenia so that they become less responsive to the environment (Halgin & Whitbourne, 2009). The lack of information about the symptoms that appear in schizophrenics causes family members to have difficulty recognizing and

dealing with these symptoms so schizophrenic do not get proper treatment (Rachmayanti, 2007).

According to Suro Dharmono Head of the PP Community Psychiatry Section (PDSKJI) (2014), if schizophrenics do not get proper treatment, it will cause various impacts such as violence in society, juvenile delinquency, and suicidal tendencies (Medcom, 2014). There is research conductedby Mahmud Abbasi which shows that schizophrenics can commit crimes caused by the influence of the hallucinations they experience (Abbasi, 2012). According to Berk (2006), individuals who have self-controlwill tend to avoid negative behavior, but on the contrary, individuals who are weak in controlling their behavior will tendto show symptoms of undisciplined behavior that violates or deviates. Therefore, it is necessary to have a treatment or intervention that can help control negative behavior and treat people with schizophrenia so that it can prevent the emergence of negative behavior in schizophrenics. Various methods of handling and intervention can be carried out, such as administering drugs regularly and providing psychotherapy to regulate the mindset and behavior of schizophrenics (Fervaha, 2014). In addition, providing support by family, friends and the surrounding community is also needed for schizophrenic (Puspitasari, 2009).

**Art Therapy as Treatment for Schizophrenia**

Treatment to cure schizophrenia does not always have to be in the hospital, but life with the surrounding community is the main resource in the healing process for schizophrenics (Khafifah, 2019). Various kinds of interventions and therapies can be carried out to support the healing process of schizophrenia, one of which is using art therapy. Art therapy is therapy through art media, and creative processes,the result of art is exploring a feeling and conflict in emotions with objectives to increase self-awareness, improve cognitive and sensory-motor functions, control behavior and addiction, improve reality orientation, develop social skills, reduce anxiety, and increase self-esteem (American Art Therapy Association, 2017). According to Malchiodi (2012), art therapy is used in various medical cases in both children and adults. Art therapy is based on a thought that the creative process in making a form of art or art can make it easier for individualsto recover and is a nonverbal communication about individual feelings and thoughts (Malchiodi, 2012). The art therapy that will be used in this research is weaving using materials from bamboo slats. Making matting is one of the art therapy techniques that can help someone express their imagination so that they can create something new (Meriyati, 2020).

Weaving activities have benefits in developing fine motor skills, expressing one's feelings, training one's emotional control well, practicing eye and hand coordination, increasing concentration, and others (Christianti, 2013). So that this weaving activity can be given to help people who have difficulties in self-control and behavior, especially in schizophrenic disorders. Furthermore, this weaving activity has become a common culture in Bali, so that the implementation of weaving activities will be easier to do and the materials used are easier to obtain, namely bamboo slats. A few of the research results show that art therapy can assist in the healing process for people with mental disorders, especially schizophrenia, such as research conducted by Lynch, Holttum, and Huet (2018), who examined the experience of art therapy in individuals with a first diagnosis of a psychotic disorder. Theresults show that there is a relationship between feelings of pleasure and attachment to art-making. Moreover, the process of art therapy can create communication between individuals and make individuals have emotional experiences that represent feelings of comfort in the art therapy process (Lynch, 2018). Some therapy participants say that the art that is made is a representation of

the participant's experience. The art therapy process can also be used as a coping strategy to support recovery.

Additionally, the participants can enjoy their works of art (Lynch, 2018). Then there are study by Edward and Hegerty (2017) explored the effectiveness of art therapy groups combining origami and mindfulness for youth with mental mental issues. The results showed that there was asignificant change in the group following art therapy. Participants showed an increase in feelings of well-being, such as feeling motivated, feeling more relaxed, and feeling less stressed and anxious. Furthermore, the group that took part in art therapy felt the benefits of art therapy activities such asfeeling calm, and happy, being able to socialize with other people, and being able to improve art skills. An additional benefit identified by the participants was the opportunity to practice accepting difficult emotions such as frustration (Edward & Hegerty, 2017). Subsequent research was conducted by Eli Furyanti and Diah Sukaesti (2018), entitled "The Effect of Free Painting Art Therapy on the Patient's Ability to Control Hallucinations" (Furyanti, 2018). The research states that art therapy can control hallucinations in schizophrenic patients. This is because the influence of free painting activities can be a communication of the patient's subconscious (Furyanti, 2018). This can be seen based on the symbols that appear in the picture which represent the patient's subconscious expression. In addition, improvement in cognitive, affective, and psychomotor aspects can be done through painting activities (Furyanti, 2018).

Based on the three research results that have been described previously, there are several similarities in the results, namely art therapy a) can represent self-expression, personal experience, and emotional self, b) foster feelings of comfort, and calm, and c) can be used as a coping strategy in dealing with conditions experienced related to stress, anxiety, and frustration. However, based on the results of previous studies,there has been no research on art therapy using matting techniques as therapy for schizophrenics. Therefore, related to the problem of individuals living with schizophrenia, further research is needed to find out the application of art therapy in controlling the behavior that appears in people with schizophrenia, especially by using matting techniques. Making matting is one of the art therapy techniques that can help someone express their imagination so that they can create something new (Meriyati, 2020).

## Conclusion

Art therapy intervention through making matting is proven to be able to control negative behavior in schizophrenia. The patient no longer appears rowdy and agitated; patients no longer show excessive reactive responses and are easier to interact with researchers. Then, the patient is no longer as hostile as before,the patient is not easily angered, nor does he swear and curse. If previously there were patients who tended to be passive aggressive, now this attitude no longer appears; instead, they became more cooperative. Patients more easily accept and followinstructions; their activities also seemed quieter. Previouslythe patient looked restless, a bit shaky at work and sweating excessively. Now these conditions are not visible and behavior control is also shown through the patient's emotions which are more controlled and directed so that the patient experiences development in receiving and carrying out the instructions given.

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# *Decoding the Name-Recall Conundrum a Novel Perspective on Cognitive Processing and Enhancement Strategies*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
This paper investigates the prevalent issue of forgetting names immediately after introductions, a problem evidenced by an 89% failure rate among a sample size of 458 individuals. We propose that the root cause of this memory lapse is not an inherent issue with memory retention or retrieval. Instead, it relates to a specific cognitive phenomenon whereby the verbal information (the name) triggers an internal visualization of a previously known individual associated with that name. This internal image, superimposed upon the visual perception of the newly introduced person, creates a disconnect between the verbal and visual components, leading to a lack of memorization. We argue that this isn't a memory failure, but an information classification issue. Initial experiments indicate that making individuals aware of the internal visual component upon introduction and training them with a technique described in this paper can effectively facilitate name recall. Our findings shed light on this overlooked cognitive phenomenon and introduce new prospects for cognitive enhancement and education beyond memory skills.

Keywords: Cognitive Processes, Name Recall, Memory Retention, Visual Association, Cognitive Mental Processes, Memory Cognitive Phenomena, Cognitive Augmentation, Model of Cognitive Process

## Introduction

Building on the new concept of perception, which aims to understand the Cognitive Process (CP) of consciousness through the mathematical model (Petty, R. E., & Briñol, P., 2015), this paper extends our investigation to everyday cognitive challenges, such as the frequent inability to remember names upon introductions. This framework provides a foundation for examining why an 89% failure rate in name recall among a sample of 458 individuals is not merely a memory glitch but relates to deeper cognitive processing issues. Although not extensively covered before, this specific phenomenon is thoroughly described within the current sections of this article.

The phenomenon of individuals forgetting names almost immediately after introductions can be understood through the lens of cognitive resonance. This issue arises not from a failure in memory retention or retrieval per se but from a complex interaction between verbal and visual cognitive processes. When a name is heard, it evokes an internal visualization of another individual previously associated with it. This visualization then overlays the visual perception of the person being introduced, causing a cognitive disconnect that impedes the association needed for memory recall.

As discussed in subsequent sections of this paper, this is not just a lapse in memory but a misclassification of information within the cognitive system. Preliminary experiments, detailed later, have shown that by making individuals consciously aware of this internal visualization process at the moment of introduction and employing a specific training technique, we can significantly improve the recall of names. This insight advances our understanding of cognitive phenomena. It opens new pathways for enhancing cognitive functions in educational and professional settings, moving beyond traditional memory training techniques to embrace a broader spectrum of cognitive skills.

## Novel Concept of Continuum Perception

Based on a broad multidisciplinary synthesis (Robbins, B. G., 2016), we introduce a new theoretical concept of the Configuration Space (CS) to describe the human Cognitive Process (CP), by which we can assign a unique ”dynamic address” to any complex situation and further process it like how the human observer on an unconscious level (intuitively) works with reality; the Electronic equivalent of consciousness with elementary mental process model (EEC) (Bernau, L., Paulu, F., & Voves, J., 2020).

### *Stratification of Cognitive Process (CP) and Cognitive Resonance*

To describe and partially design a complex structure as the human CP, it is necessary to operate in specific artificially established system levels (layers) even though the real CP works with all layers simultaneously. In the following description, we first follow the process in which the input visual signal ($V$) from the external environment constructively interferes with the verbal-acoustic signa ($VeA$) from the basic image matrix ($BIM_V$) to the third order Abstract Process ($AP_{III}$) (Bai, M., Ih, J.-G., & Benesty, J., 2013). The $VeA$ signal is supplemented into the system by the observer’s Neural Networks (NN), as they have been taught to the given visual signals. Subsequently, we describe CP from the opposite side, where the verbal-acoustic signal ($VeA$) comes into the system from the external environment (words and sentences). The NN complements the learned visual signal ($V$) with which they constructively interfere. The synthesis of both simultaneous processes in the human CP is

called Cognitive Resonance CR in this model. The CR process can be imagined effectively by realizing that any visual perception (object, situation) always belongs to NN's specific verbal formulation. Thus, when looking at any object, the incoming visual signal is recognized by hearing the "inner voice" in the background, by which the NNs name this object. Vise versa, after hearing a word, a sentence, or a characteristic sound (for example, a passing vehicle), NN projects their Learned Optical Visualization (LOV) in the mental space. The CR can be amplified by concentrating on the incoming visual signal ($V$) or closing the eyes after hearing the incoming acoustic signal ($VeA$). Under standard conditions, each observer projects an internal LOV image generated by NN through the image coming from the optical receptors ($V$). The NN's image (which is the transformation of $VeA$) is significantly weaker and constructively interferes with the external environment's image. This causes some parts of the $V$ in the $BIM_V$ to amplify. The explanation process is based on this principle.

### *Illustrative Situation*

The CP mechanism is inherently universal, which defines the mathematical description of CP. However, for better understanding and clarity, we will use a model involving introducing two individuals, Maria and Peter, where Peter is the observer. The model is described from Peter's perspective, thus detailing the algorithm for remembering the name Maria. To clarify the first levels of the CP, it is necessary to initially work with the idea that all moving objects are "frozen in time." At the lowest level of CP, the external visual signal of the overall situation falls as a 2D image on the observer's retina. We define this "raw" signal (V) as the basic image matrix $BIM_V$, formula 1.

$$BIM_V = \begin{bmatrix} a_{11} & \dots & a_{1n_a} \\ \vdots & \ddots & \\ a_{m_a 1} & & a_{m_a n_a} \end{bmatrix} \quad (1)$$

Each point the frequency and amplitude of individual pixels of the incoming $V$ defines $a$. In the ideal center of $BIM_V$ we further determine its central coordinate, the point $Q_{out}$. Every time observer changes the position of eyes, head, body or starts to move, a new center coordinate $Q_{out}$ is set for $BIM_V$ and all points $a$ in $BIM_V$ correspond to the resulting movement, Figure 1.

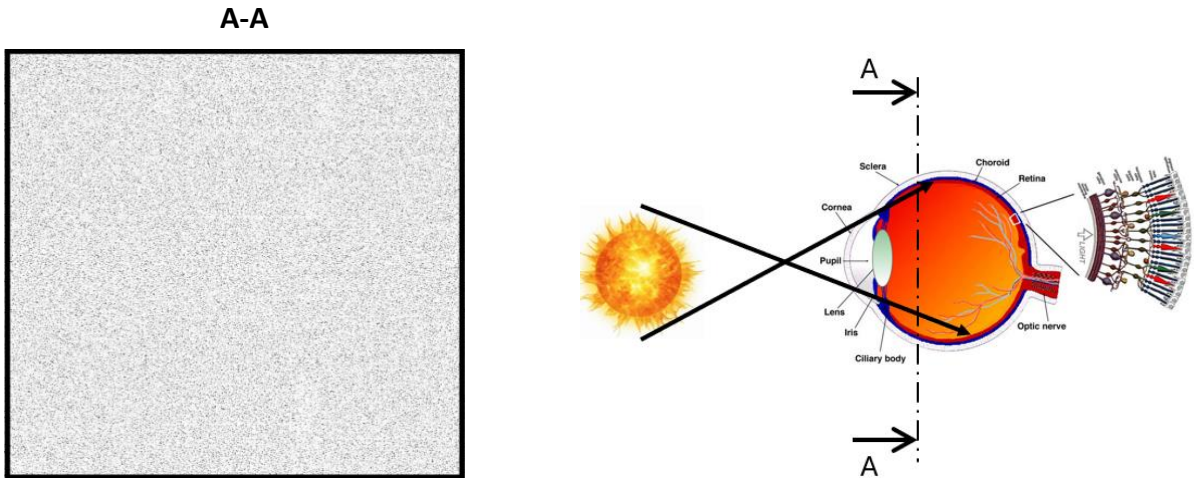



Figure 1: (left) Empty observer's basic image matrix $BIM_V$. (right) Illustration of the retina in the eye with incoming light (Kolb, H., 1991).

In the next level of CP[4] called amplified amplitudes matrix $V_{amp_\varepsilon}$ (formula 2), the amplitudes of all points $a$ in $BIM_V$ which have a similar frequency and at the same time are close to each other (adjacent to each other) are amplified.

$$V_{amp_\epsilon} = \begin{bmatrix} b_{11} & \cdots & b_{1n_a} \\ \vdots & \ddots & \\ b_{m_a 1} & & b_{m_a n_a} \end{bmatrix} \quad (2)$$

The amplified amplitudes matrix $V_{amp_\varepsilon}$ is defined, where each point $b$ corresponds to point $a$ from the matrix $BIM_V$, which amplitude is amplified if it satisfies the condition:

$$b_{xy} = a_{xy} + A_{\epsilon_{xy}} \quad , \quad (3)$$

where $x$ and $y$ are coordinates in $BIM_V$ and $A_{\varepsilon_{xy}}$ is a similarity in frequency of a point $a$ to its nearby points in $BIM_V$, Figure 2.

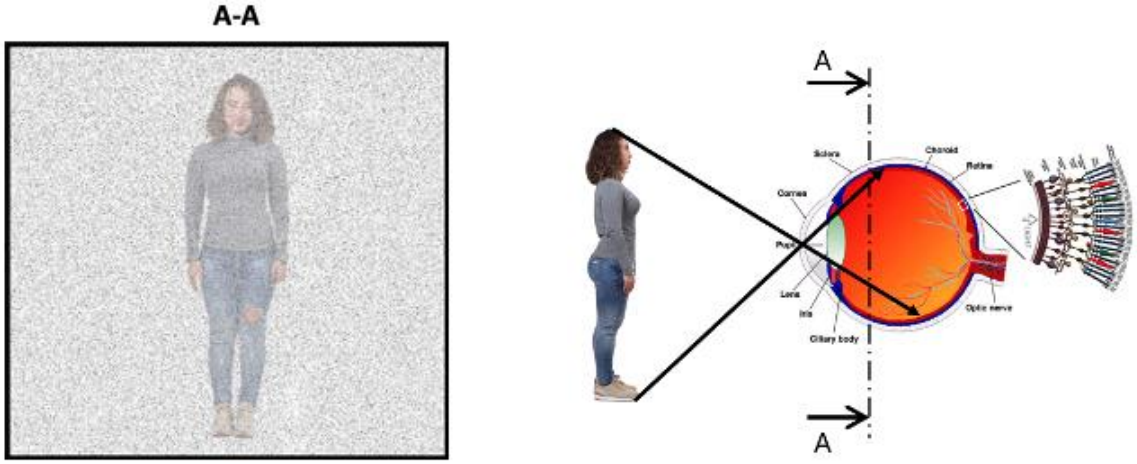



Figure 2: (left) Observer's basic image matrix $BIM_V$ with creating matrix coordinates with their amplification near points with similar frequencies. (right) Illustration of the retina in the eye with light reflected from Maria (Kolb, H., 1991).

In further level of the CP, which is called visual components matrix $V_{comp}$, to each object that the observer recognizes, i.e., to which it is possible to assign a specific verbal formulation.

$VeA$ (Maria), a separate partial matrix $V_{comp_n}$ (formula 4) is assigned, arising as a cut out from $V_{amp_\varepsilon}$. Thus, the visual components $V_{comp}$ constructively interfere with the verbal audio ($VeA$) "Maria," resulting in further amplifying $V_{comp_n}$, Figure 3.

$$V_{comp_n} = \begin{bmatrix} b_{x_{i_n} y_{i_n}} & \cdots & b_{x_{e_n} y_{i_n}} \\ \vdots & \ddots & \\ b_{x_{i_n} y_{e_n}} & & b_{x_{e_n} y_{e_n}} \end{bmatrix} \quad (4)$$

Partial matrices are rectangular; their edges are always formed by the farthest point, which still belongs to the given $VeA$ in the respective direction. For example, the sneakers and Maria's hair determine the height of a rectangle that forms a partial matrix with $VeA$ "Maria." As well as the arms or hands on the left and right side determine its width. Thus, the partial matrix contains the amplified points of the tree, which are similar to each other, and a part of

its background located in the corresponding rectangle $V_{comp}$. In the center of a partial matrix, i.e., in each rectangle's center, we define the center coordinate $Q_{in}$. For each change in the observer's movement (change in the position of his head or eyes), a new value of the center coordinate $Q_{in}$ is set for each $V_{comp}$. In the next level of CP,[4] which is called the Space Perception Matrix (SPM), all $V_{comp_n}$ for each specific $VeA^I$, are compared with a learned reference value of their average size or more precisely, average area of their $V_{comp_n}$ by

$$P_n = \frac{(x_{e_n} - x_{i_n})(y_{e_n} - y_{it_n})}{S_{ref_t}} , \quad (5)$$

where $P_n$ is the ratio of the area of $V_{comp_n}$ to the learned reference area $S_{ref_t}$, where $t$ is a type of a component directly belonging to a specific $VeA_t^I$ (Maria).

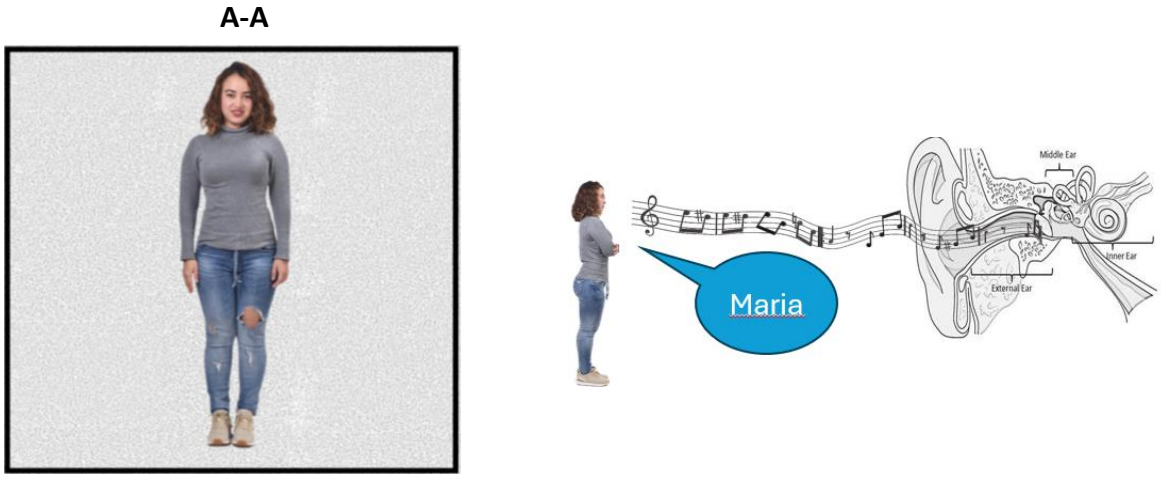



Figure 3: (left) Observer's basic image matrix $BIM_V$ where the visual components $V_{comp_n}$ constructively interfered with $VeA$ Maria from the ear. (right) Illustration of the sound sensation (Polyak, SL., 1941).

By this mechanism, due to the different sizes of the same objects (or more precisely the area of their $V_{comp}$) and due to their comparison with learned reference size $S_{ref_t}$, perception of space is created in this CP level for the first time, (The observer does not know another Maria). It should be emphasized that in this level of the CP model, all objects are static. Furthermore, the spatial perception is created only by the synthesis of a 2D image, not by binocular stereoscopic vision (Blake, R., & Wilson, H., 2011, Vishwanath, D., & Hibbard, P. B., 2013). The perception of space is created by the observer's neural networks assigning $VeA$ "closer" to larger objects (larger than their mean reference size) and $VeA$ "further" to smaller objects. Since the perception of space arises in one of the lowest levels of CP, it is fundamentally inherent. Therefore, it is very difficult to imagine space as a 2D scheme with differently sized $V_{comp_n}$, even in a photography. It requires a special, high-performance CP and individuals with this ability are usually, without realizing it, talented painters or architects. Multiple $V_{comp}$ (more trees in $BIM_V$) to which the observer can assign the $VeA$ "closer" or "further" are called spatial reference objects (SRO). In a specific situation SROs do not have their usual size (some people are unusually large/small).

For other levels of CP, the static restriction where all objects are as if "frozen in time" is no longer valid. This restriction was introduced to better understand the basic levels of CP. However, no static phenomenon occurs in CP. In all levels of CP, starting with the $BIM_V$ there is a movement of all its components through the observer's consciousness in situational

dimensions. This phenomenon is natural for every observer, and therefore its existence under normal conditions is practically impossible to realize.

Returning to the illustrated example of introducing. As the situation progresses, the ”record/introducing” of this situation shifts through the observer’s consciousness in the situational matrices. The observer himself does not perceive this recording, as is described in the EEC (Bernau, L., Paulu, F., & Voves, J., 2020), but if asked, the observer could imagine the whole situation again or backward and ”replay” any part of it for a certain period of time. We hypothesize that short-term memory is an area of the CP in which $BIM_V$ and the respective $V_{comp}$ and their respective $VeA^{II}$ are still fully present (”flowing”) in the situational dimension in the consciousness of the observer.

In this level of CP, the individual $V_{comp}$ moves through the consciousness of the observer according to the relationship:

$$M_n = \frac{1}{P_n} \sum_{x=x_{in}}^{x_{en}} \sum_{y=y_{in}}^{y_{en}} K_\Delta \left( \frac{\delta b_{xy_{(s)}}}{\delta s} \right) \quad , \tag{6}$$

where $M_n$ is a quantity determining the rate of motion of each given $V_{comp_n}$ and $b_{xy_{(s)}}$ is a point (pixel) and a function of variable *s*, where *s* is the speed of motion in a situation (time), which we differentiate concerning the situation, where it is true that the more dynamic the change in motion, the higher its value. By this mechanism, the observer amplifies the perception of moving objects beyond their amplification by the principle of self-similarity from $V_{amp_\varepsilon}$. $K_\Delta$ is a learned nonlinear function that corrects the derivative so that the gain is effective concerning the rate of change. The distance factor is tack-led by the quantity $P_n$. If objects move at the same speed, those that are closer are amplified more and vice versa.

The next level of CP called *SM* is created (7). In this level, the slowed optical signal moves through the consciousness of the observer in a form of ”visual flow” in the situational dimension characterized by those mentioned above dynamically changing parameters ($U_{S_n}$, $D_{S_n}$, $L_{S_n}$, $R_{S_n}$, $V_{S_n}$, $H_{S_n}$, $M_{S_n}$, $P_{S_n}$) for individual ”situational layers” ($S_1$, $S_2$,.. $S_n$):

$$SM_n = \begin{bmatrix} U_{s_1} & U_{s_2} & U_{s_3} & \dots \\ D_{s_1} & D_{s_2} & D_{s_3} & \dots \\ L_{s_1} & L_{s_2} & L_{s_3} & \dots \\ R_{s_1} & R_{s_2} & R_{s_3} & \dots \\ H_{s_1} & H_{s_2} & H_{s_3} & \dots \\ V_{s_1} & V_{s_2} & V_{s_3} & \dots \\ M_{s_1} & M_{s_2} & M_{s_3} & \dots \\ P_{s_1} & P_{s_2} & P_{s_3} & \dots \end{bmatrix}^{VeA_n^{II}} \quad , \tag{7}$$

where $SM_n$ is the $SM$ for $V_{comp_n}$. Each column represents one ”time slice” of a given $V_{comp_n}$. Its top four values are $IN_{form}$ containing *Up*, *Down*, *Left* and *Right*, two values are $OUT_{form}$ containing *Horizontal* and *Vertical* values according, and the last two values are $M_n$ and $P_n$ of size $V_{comp_{n_{Sn}}}$ (formulas 6 and 7). Each $SM$ has a corresponding $VeA^{II}$, which describes the situation. For the sake of simplifying comprehension, we have selected the scenario of introducing, which in this case is static and thus not in motion, eliminating the need to further explore $SM$ and $VeA^{II}$.

### *First-Order Abstraction Process*

The abovementioned model explains the principle of first-order abstract thinking $AP_I$. The observer (Peter) is looking on the Maria's body. In his consciousness, through the Cognitive Cascade (CC), Figure 4, individual $V_{comp_S}$ with the corresponding $VeA^I$ (Maria) are created from $BIM_V$. In this level of CP, the NNs of the observer create all the variations of $V_{comp}$ which the NNs have been taught and assign to them the corresponding $VeA_n^{III}$. Thus, we can imagine the first-order abstract process as a matrix of all variations that the given situation contains and the $VeA_n^{III}$s belonging to them. Thus, this CP level is a fundamental generator of logical thinking, where all variations of all variants of all $V_{comp_S}$ and their $VeA$s are equivalent. It can be imagined as an analogy to mathematics, where all the rules in all the expressions' variants are permanently active. Statements corresponding to all variations at the same time simultaneously are considered logical. An equivalent verbal formulation achieves a different number of variations in $AP_I$ by a different observer. The higher logical intensity is achieved by an observer with "richer" variations in $AP_I$, which then amplify certain partial variations in $AP_n$. First-order abstraction via $VeA_n^{III}$ amplifies the visual dynamics of those $V_{comp}$ in $BIM_V$ to which the given $VeA_n^{III}$ corresponds, i.e., of all that are included in a given $VeA_n^{III}$ cognitive cascade. The order in which the given $V_{comp_S}$ occur in the respective $SM$s is of fundamental importance for the $AP_I$. In the illustrated introducing situation, suppose a given $VeA_n^{III}$ shapes all the Marias that we know, forming their individual visual components ($V_{comp_S}$) along with $VeA^I$.

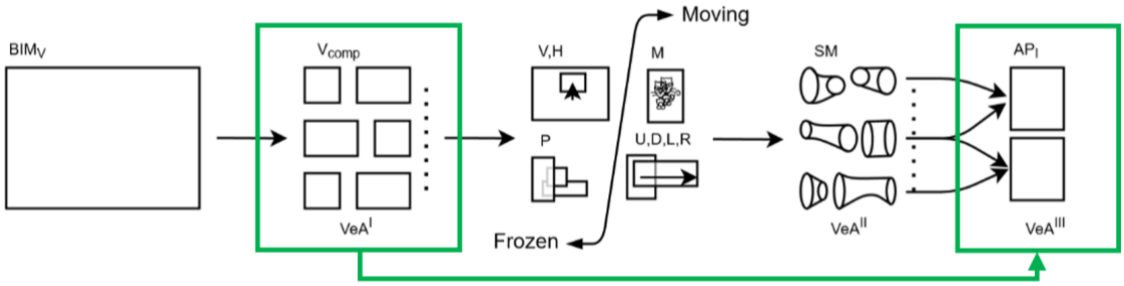



Figure 4: The model of cognitive cascade process summarizes the visual part of the CP, where (from the left side), by amplifying self-similar points in $BIM_V$ an individual visual component provided with $VeA^I$ (verbal formulation of 2D objects) are obtained.

When processed by SPM, spatial perception, $IN_{form}$ and $OUT_{form}$ emerge. By further amplifying the moving points of the $SM$, individual visual components move through the observer's consciousness as specific spatial objects with the corresponding $VeA^{II}$ are obtained. Subsequently, all their variants are combined into all variations in the $AP_I$ process, where each variation is given a specific $VeA^{III}$. The green representation is the CP algorithm for memorizing names.

It is possible to describe the illustrated model upon obtaining the necessary foundation of the CC mathematical model. We have understood how an image (Maria) forms on the observer's (Peter's) retina and through which mechanisms the $V_{comp}$ visualization of Maria is created in Peter's consciousness. Therefore, during introductions, the observer (Peter) needs to visualize the introducing person (Maria) with $VeA^{III}$ Maria, paralleling all the Marias he knows, and then update this information (identification of Marias) with $AP_I$. This represents a fundamental contribution of the CC mathematical model. If a name is not remembered, the observer updates $BIM_V$, and consequently, association with $AP_I$ is not possible, leading to the

forgetting of the name, Figure 5, as summarized in the statistics presented at the end of this paper.



Figure 5: Observer's basic image matrix $BIM_V$. The visual components ($V_{comp_n}$) and verbal audio ($VeA_n^{III}$) are in conflict, and the first-order abstract ($AP_I$) has not been updated with the new Maria. As a result, name recall in this instance is either random or improbable.

### *Audio Signal Processing*

However, a more in-depth description and explanation of the acoustic signal processing mechanism (Boashash, B., 2016) and its phenomena is beyond this paper's required capacity and will be described in its continuation. Nevertheless, it is crucial to understand that all processes, i.e., processing V and A and other signals from subsystems (vision (Hickey, C., & Peelen, M. V., 2015), hearing (Sottek, R., & Genuit, K., 2005), smell, touch, heat, cold, pain (Cabibihan, J., Joshi, D., et al., 2015), proprioception (Tuthill, J. C., & Azim, E., 2018), vestibular sensor (Hitier, M., Sato, G., et al. (2016)), interoreceptors (Lazovic, B., Zlatkovic Svenda, et al., 2016) and taste (Ji, M., et al., 2014), take place simultaneously within the CP4 of the observer. Incoming $V$ is processed by synthesis with corresponding $VeA$ according to the above described laws up to the level of highest order abstraction processes, which are not discussed in this article. Simultaneously, the "inversely complementary" process of "deabstractization" of incoming $VeA$ and surrounding $A$ takes place via the synthesis with appropriate visualizations in all variants of all variations back to the $BIM_V$ level. All these processes interfere with each other in the observer's consciousness simultaneously, continuously and, above all, physically. Their resulting super synthesis is in this model the mechanism (principle) of the phenomenon of thinking. This super synthesis can, in turn, be seen as a logical superstructure of individual phylogeny, which has implicitly continued to evolve through communication and cooperative behavior on the social level.

## Conclusion

Numerous studies have investigated this issue, utilizing various methodologies. However, a significant challenge arises in their comparison, as none of these studies is founded on a fundamental mathematical model of the cognitive process. Depending on the diverse methods used, name recall after an interaction or over time intervals have been observed to vary between 46.92% and 94.6% (Almond, N., & Morrisonb, C., 2017, Burton, A., Jenkins, R., & Robertson, D., 2018, Popov, et al., 2018, Brédart, S., & Vanootighem, V., 2022). The studies on name recall are based on the publications mentioned (Hamilton, L. J., & Krendl, A. C., 2024, Brédart, S., & Vanootighem, V., 2022), with the methodology and evaluation described

in these studies. Among 458 respondents, the problem of remembering names was demonstrated in 89% of individuals.

In this work, we have delineated a foundational mathematical model of the CP. We further dissected the CC mechanism and applied it to the memory retention of names during introducing. A significant contribution of this study is the innovative approach to cognitive processes of consciousness, which yields effective methodologies beyond just the illustrated example. To eliminate the issue of name, recall at introductions, we visualize the first-order abstract containing all Marias during each introduction. If the Maria in question is unknown, we also visualize all Marias in the first-order abstract ($AP_I$) using verbal audio ($VeA^I$) and update it via the visual component ($V_{comp_n}$), thus refreshing the first-order abstract ($VeA^I$) with the new Maria. A significant contribution of this study is the creation of new mnemonic tools using the mathematics of this model, not just for names but across various aspects of daily life where memory enhancement is essential.

Suppose this mechanism fails to occur and the name is not remembered. In that case, the issue does not reside within memory itself but in the conscious movement within the mental space of consciousness.

All theoretical assumptions presented here are based on empirical data obtained during 20 years of research in skydiving and aviation (Paraclub Olymp Prague., 2024, April, S. A. S. s.r.o., 2024, April). By applying this research to practical activities, the authors achieve remarkable results. Based on them, a novel model of the human CP is gradually emerging. The new concept of continuum perception results from a multidisciplinary synthesis originally based on extensive research into human behavior in extreme conditions. It brings a whole novel perspective on the human CP. Its fundamental benefit is the implementation of the phenomenon of consciousness as an evolutionary substrate (Mattick, J. S., & Mehler, M. F., 2008) of human intelligence (Hampshire, A., Highfield, et al., 2012). The application of this model to various areas of human mental (Rüsch, N., et al., 2009) and physical performance (Puthucheary, Z., et al., 2011) such as memory (van Gerven, M. A. J., Maris, et al., 2013), concentration (Mahmoudi, B., & Erfanian, A., 2006, Greenlees, I., Thelwell, R., & Holder, T., 2006), emotional stability (Elkins, R. K., Kassenboehmer, S. C., & Schurer, S., 2017), orientation in space (Peer, M., Salomon, R., et al., 2015), reflexes (Horslen, B. C., Dakin, et al., 2014), fast decision-making (Kester, L., Griffin, A., Hultink, E. J., & Lauche, K., 2011), perseverance (Tenenbaum, et al., 2004) brings very convincing results (Clemente-Suárez, V. J., Robles-Pérez, et al., 2017, Mazurek, K., et al., 2018). Equally interesting are the results in the treatment of psychological problems (Dutcher, J. M., & Creswell, J. D., 2018) such as fear of heights (Salassa, J. R., & Zapala, D. A., 2009), fear of flying (Oakes, M., & Bor, R., 2010), learning problems (Benicasco, J., Witnauer, J., & Kopunek, K., 2020)and communication (Adams, C., Lockton, et al., 2012). Very interesting results are in the level of understanding in communications (Kwon, G., Smith-Jackson, T., & Bostian, C., 2011), teamwork and minimizing misunderstandings (Endsley, M. R., 2015) and conflicts.

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# *Cognitive Augmentation Through Game Dynamics: The IMLS Variant of Mathesso and Its Implications for Mathematical Intuition Enhancement*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
In this article, an interdisciplinary approach is undertaken to analyze the IMLS (Inverse Mathesso with Lowest Sum) variant of the Mathesso board game, fusing principles from mathematics and cognitive psychology. Retaining the token system of the original, the IMLS introduces distinct cognitive and psychological benefits. Enhanced activation of reverse synaesthesia, underpinned by cognitive psychology research, contributes to the systematic augmentation of memory retention capabilities. Additionally, the IMLS stimulates anticipatory abilities across multi-faceted logical layers, including contradictory ones. The game's 'inverse complexity', observed as players advance, emphasizes the strategic objective of achieving the lowest token sum, diverging from the original Mathesso's approach. This shift fosters unconventional extensions in logical reasoning. The IMLS not only amplifies mathematical intuition but, supported by psychological studies, showcases implications for real-world logical applications and cognitive processing patterns. A key feature of the IMLS setup is the initial exposure of the tokens' colored sides, setting a primary probability distribution for token pairs at 50/50, dynamically adjusting as gameplay evolves.

Keywords: Mathesso, Inverse Mathesso With Lowest Sum, Imls, Mathematical Intuition, Cognitive Augmentation, Model of Cognitive Process, Reverse Synaesthesia, Logical Reasoning, Strategic Gameplay

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## Introduction

Mathematics is foundational to understanding and functioning in the modern world. It is essential for problem-solving, logical reasoning, and technological adeptness. Early math skills are critical for later success in school and beyond. A study found that preschoolers' math skills are predictive of their future academic performance, not just in math but also in reading and science, across all grades up to eighth grade (Claessens & Engel, 2013).

As young children develop the ability to perceive and operate with numbers, the process gets concerningly often disturbed by misunderstanding (Whyte & Bull, 2008). Such difficulties combined with the pressure to perform cause lack of self-confidence and often lead to aversion, that only deepens due to way-too-early transition from arithmetic to mathematics without providing opportunity to master the basics (Kaskens et al., 2020).

The Science 21 Foundation is working on a mathematical model of the cognitive process. Based on this model, a large number of applications (Bernau et al., 2020) are being designed to augment various cognitive processes. One of the applications is a universal mathematical game in which players do not need to count or even know numbers. A game that entertains children and adults alike and that not only teaches them how to count but most importantly opens them up to the basics of mathematics. Because counting and mathematics are not the same thing. This is the first of many misunderstandings that playing Mathesso will set straight (Janeček et al., 2022).

Mathesso aims to activate the cognitive processes responsible for the origin and development of mathematical intuition (Dehaene, 2009). It uses reverse synaesthesia as the most important learning mechanism (Watson et al., 2014). It is a phenomenon where people associate certain sensory perceptions with others, for example tones in music with colors (Zamm et al., 2013), in Mathesso we associate colors with numbers. When playing Mathesso, preschool children can quickly evolve what is known as a backbone algorithmic system, a concept described in Odic (2017). Children do not need to be able to recognise a single number, they can start learning the principle of multiplication, prime numbers and powers simply with the guidance of colors. Among other things, they will gain intuitive knowledge of the multiplication table (Janeček et al., 2022) that more advanced players then combine with addition and subtraction in the IMLS (Inverse Mathesso with Lowest Sum) version of the game.

## Application

The game Mathesso is an adaptation of a well-known children's game, which is widely known in the world under various names such as Concentration, Somewhere Memory, Matching, Pairs, Match, Match Up, Pelmanism, Pexeso or Pairs (Wilson et al., 2011). This game is popular for its simplicity and intuitive rules that allow even very young children from the age of three to participate (Rakoczy et al., 2009). This allows children to learn the concepts and rules of the game in a funny way without having to know how to read or write (Fuson et al., 2015).

The basic rules of Mathesso are simple and easy to understand. Two jettons are turned over in turn, if they are the same the player takes them, if not he turns them back. The next player continues to do the same. Play continues until all jettons are collected from the board. For the little ones, the one with the higher stack of jettons wins. For more advanced players, the chips

have different point values, which adds a strategic dimension. The winner is the player with the highest number of points.

Mathesso is proving to be an effective tool for developing mathematical intuition in children. The game naturally promotes the development of the ability to recognize and apply mathematical concepts such as number relationships, basic multiplication and division operations, and even understanding the concept of prime numbers, all without formal training in mathematics. Children learn to identify patterns and think strategically about the next moves, which contributes to the development of their analytical and problem-solving skills (Tarım, 2015).

Mathesso offers more than just fun for little ones. Its ability to foster the development of mathematical thinking and intuition in children makes it a valuable pedagogical tool that can be an integral part of early education. Through an interactive and fun format, the game helps children develop key cognitive and mathematical skills that are the foundation for future educational success (Alsubaie et al., 2018).

After its initial launch in 2021, Mathesso has quickly spread and gained the attention of the public and educational institutions. The "Mathesso in Schools" project aimed to integrate the game into school curricula. By the beginning of 2024, significant interest in the game was recorded, with more than 1,000 schools and other educational institutions in the Czech Republic expressing interest in incorporation of it in the educational process. Detailed statistics are presented in Table 1.

| **Institutions** | **Count** | **% in the Czech Republic** |
|---|---|---|
| Kindergartens | 17 | 0.3% |
| Elementary Schools | 962 | 20% |
| High Schools | 47 | 4% |
| Retirement homes | 5 | 4% |

Table 1: Number of institutions owned by Mathesso at the beginning of 2024.

We are working closely with several of these institutions on studies regarding in-depth research on the impact of Mathesso on educational processes and its impact on students. These studies focus on the integration of the game into the school curriculum and evaluate its effectiveness in improving students' mathematical skills and cognitive abilities. Initial results suggest a positive impact on mathematical intuition and logical thinking.

In 2024, a new tradition of international Mathesso tournaments was launched, attracting participants from different countries, including twenty chess grandmasters. This competition brought further international recognition to the game and positive feedback from participants who appreciated the strategic depth and educational potential of the game.

Mathesso is not limited to the Czech Republic. There are ambitions to expand its use as a teaching tool to other countries, including the African continent, Peru, and Portugal. These initiatives are driven by a desire to provide equal educational opportunities through innovative and accessible learning tools.

Mathesso is fast becoming an established educational tool with the potential for global impact. Its ability to promote cognitive development and mathematical skills has been used in a variety of educational contexts, contributing to the wider acceptance of play as an effective pedagogical tool.

For example, independently of us, a study was published at Charles University about the possibilities of the usage of Mathesso as a diagnostic tool in psychological assessment. They compared the results of cognitive tests and the game performance of adults and came up with a significant correlation between the error rate in the gameplay and performance on an intelligence test. So the game itself has the potential to reflect the intelligence performance of the player (Šimková, 2023).

**Inverse Mathesso With Lowest Sum (Imls)**

In an ongoing effort to improve and deepen the pedagogical benefits of Mathesso, a new variant called "Inverse Mathesso with Lowest Sum" (IMLS) has been developed. This innovation is based on the original game concept but introduces a new dimension of strategic thinking and mathematical reasoning.

IMLS uses the same set of chips as traditional Mathesso, allowing for easy adaptation for those already familiar with the game or who already own it. The main change in the rules is that at the start of the game, the chips are placed with the colored side facing up, as opposed to the original layout. This arrangement of the chips encourages players to think about the strategies of the game from a different perspective.

The most significant change is the way of evaluation: the player who has the lowest sum of points at the end of the game wins. This change trains the player's mathematical intuition for multiplication and division as well as addition and subtraction, for several situations at once. Thus, the player subconsciously gains intuition for solving systems of equations (Fleck & Kounios, 2009).

The full game Mathesso contains chips up to 121 which equals 11 times 11. However, it is recommended to use only a smaller number of chips depending on which part of mathematics you want to practice. In this article, for practical purposes, we will use the jettons up to the number 6 shown in Figure 1, otherwise known as the Mathesso Travel variant.




Figure 1: The start of the IMLS game with jettons up to 6 (Mathesso Travel).

***Rules***

1. Flip the jetton with the highest number.
2. Flip any other jetton or declare that there is no matching jetton.
    a. You may challenge the previous player if you believe they made a mistake and give him your jetton.
    b. Keep the jetton(s) with either the white side with the same number or the colored side facing you for a different number.
3. The next player continues from point 1.

After all chips are collected from the board, the player with the lowest point total wins.

***Cognitive Augmentation***

Playing any game exercises certain cognitive functions of the player (Unsworth et al., 2015). In our game, thanks to the cognitive process model, the rules were designed to not only improve mathematical intuition more than the original version but also to train players in the aspects that are most beneficial in everyday life. These aspects include memory, strategy, logic, attention, randomness, mathematical intuition, predictability, and empathy. Some of the phenomena of the game are described here.

From a strategic point of view, this game is at a high level. In the first game, players usually concentrate on finding even the pairs with the smallest sum. After a while, the player starts to

concentrate on making sure that the opponents do not get the opportunity to get chips with a smaller numerical sum than himself. In this way, the player subconsciously acquires that intuition for solving systems of equations (Fleck & Kounios, 2009).

As a presentation of the complexity of possible strategies, the first move advantage is discussed here in terms of the number of players. In this case, the key question is which jetton is advantageous to flip first: the jetton with the green-pink six or the orange-red six. The probabilities of what average score a player ends up with after the first turn only relative to his opponents have been calculated. The results, shown in Figure 2, show that in this small version of the game, it is always more advantageous to flip the green-pink jetton because it always has a smaller average. The results also suggest that the benefits change non-linearly and although it is disadvantageous to start this way in game with two players, it already looks the opposite with four players. This shows that the mere factor of the number of players significantly changes the strategy of the game. There are many such factors in the game, and their significant non-linear change with each change in play or just move, shows the large number of strategies that can be chosen, keeping the game interesting even for advanced players (Bonanno, 2015).

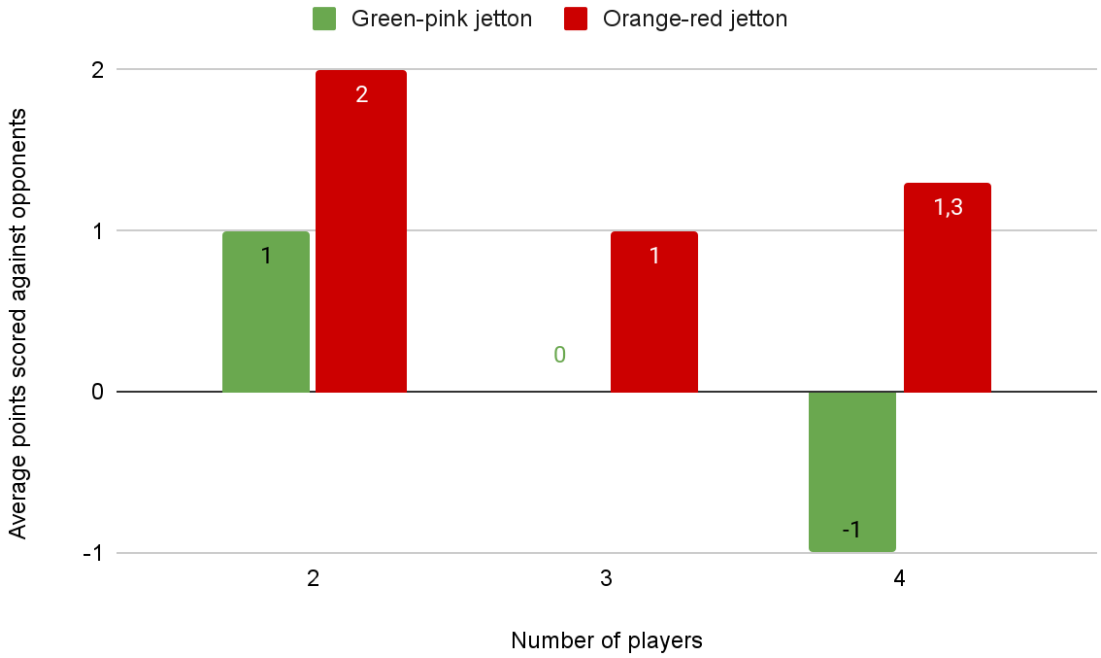



Figure 2: Evaluation of the first move strategy in the IMLS variant with Travel Mathesso.

Another phenomenon of this game is randomness. Mathesso is one of the few games that include an element of randomness, which is unlike games such as chess or go. We perceive randomness as a key educational element, which is particularly important for the realization that not everything can be influenced by pure logical reasoning, and yet this element can have significant benefits (Al-Hammadi & Abdelazim, 2015). This feature allows players to learn how to cope with uncertainty and unpredictability, skills that are also very valuable in real life.

The last phenomenon we discuss in this game is bluffing, which is designed to reflect real-life situations as much as possible. Bluffing (W. Wang et al., 2020) is one of the most interesting features of this game. One such situation can take place when a player flips over a

yellow prime number jetton and declares that it is the last five on the white side of the jettons in play. Several things can happen:

1. Another player believes him and does not intervene.
2. The next player notices his "mistake" because there is a white five under the pink-green five, and tries to refute his claim.
3. The next player realizes he is bluffing and tries to prove it.
4. The next player discovers that he is bluffing, but accepts it because proving it would be too risky, so he lets it go.
5. The next player also bluffs.
6. The next player discovers that he is bluffing, and hopes that the next player will also bluff, which is called double bluffing.
7. Etc...

The possibilities are many, and it often turns out that people try to read the other player rather than calculate the correct answer. This makes the game all the more interesting and fun, and strengthens skills like predictability and empathy (The Oxford Handbook of Lying, 2018).

## Conclusion

The original Mathesso game succeeded as a tool for developing children's mathematical intuition. Due to its ability to intuitively introduce basic mathematical concepts without the need for formal education, Mathesso is gaining widespread use in schools and other educational institutions. This paper introduces the Mathesso game and its newly developed variant, Inverse Mathesso with Lowest Sum (IMLS), which integrates the principles of addition and subtraction into the original game format.

With the development of IMLS, educational impact takes on a new dimension compared to the original variant. The game motivates players to think more strategically, where the combination of multiplication and division with addition and subtraction in several possible variations simultaneously leads to intuitive solutions of systems of equations throughout the game. This approach not only strengthens mathematical skills but also improves players' cognitive flexibility and analytical skills.

Research is now moving towards further extending the mathematical methods incorporated in the game to enhance its pedagogical potential. Plans are underway to integrate additional mathematical operations and concepts that could further deepen players' understanding and application of mathematical principles. The goal is to make IMLS a standard educational tool widely available for schools and other educational institutions to promote wider acceptance and effectiveness in mathematics learning.

The development of IMLS is an example of how innovative pedagogical tools can enhance traditional educational methods and offer students a stimulating and interactive way to learn and develop key skills for their future academic and personal success without the assistance of a teacher.

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# *Predicting Marital Stability: An Approach for More Characteristics*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
This study aims to explore the usefulness and characteristics of data from the Divorce Predictors Scale (DPS), based on Gottman couples therapy, in predicting and understanding marital stability. The data used in this study is sourced from a previous research paper that employed the DPS questionnaire. The participants consisted of 84 (49%) divorced and 86 (51%) married couples. In addition to completing the DPS, participants also provided personal information. The current study utilizes a different approach by applying structural equation modelling (PCC-SEM) and statistical analyses with varying thresholds to the existing data. The main objectives are to assess the predictive power of the DPS and identify the key features/items within the scale that significantly influence divorce outcomes. Furthermore, this study incorporates the Bayesian prediction of categories modelling technique to enhance the predictive accuracy of the DPS. By employing Bayesian methods, the study aims to capture the uncertainty and variability within the data, providing more robust predictions of divorce outcomes. Additionally, the study explores the data mining properties of the DPS dataset through clustering analysis. The goal is to identify distinct patterns or clusters within the data that may reveal underlying subgroups or characteristics related to marital stability.

Keywords: Mixed Methods, DPS, Gottman Couples Therapy

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## Introduction

Marital stability is a fundamental aspect of interpersonal relationships and has significant implications for individuals and families. Understanding the factors that contribute to marital stability and predicting the likelihood of divorce can aid in the development of effective interventions and support systems for couples facing relationship challenges. Previous research has highlighted the importance of identifying predictors of divorce and assessing marital satisfaction to promote healthy and enduring marriages [1][2].

The Divorce Predictors Scale (DPS) is a widely used assessment tool based on Gottman couples therapy, which focuses on identifying specific factors that are indicative of marital stability or risk of divorce. The DPS comprises a comprehensive set of items designed to evaluate various dimensions of the marital relationship, including communication patterns, relationship dynamics, compatibility, and self-reflection [3]. The scale has demonstrated good psychometric properties and has been utilized in diverse cultural contexts [4].

The primary objectives of this study are twofold: first, to explore the usefulness and characteristics of data obtained from the DPS in predicting and understanding marital stability; and second, to apply advanced statistical analyses, such as structural equation modeling (SEM) and Bayesian prediction of categories, to enhance the predictive accuracy of the DPS. By examining the relationships between the DPS items and divorce outcomes, this research aims to identify the key features or dimensions within the scale that significantly influence marital stability.

Additionally, the study will investigate the data mining properties of the DPS dataset through clustering analysis. This analysis seeks to uncover underlying patterns or subgroups within the data that may provide valuable insights into the characteristics associated with marital stability.

### Previous Studies on Predicting Divorce and Assessing Marital Stability

A substantial body of literature has focused on predicting divorce and assessing factors that contribute to marital stability. Researchers have employed various methodologies, including longitudinal studies, observational research, and self-report measures, to identify predictors of divorce and evaluate the quality of marital relationships [5]. Studies have highlighted the significance of communication patterns, relationship dynamics, compatibility, and other dimensions in understanding and predicting divorce outcomes.

### Review of the Divorce Predictors Scale (DPS) and Its Psychometric Properties

The Divorce Predictors Scale (DPS) has emerged as a prominent tool for assessing marital stability and predicting the likelihood of divorce. Developed based on Gottman couples therapy, the DPS encompasses a comprehensive set of items that capture key aspects of the marital relationship. Numerous studies have examined the psychometric properties of the DPS, including its reliability, validity, and factor structure, providing evidence for its robustness and applicability across diverse populations [6] [7].

## Overview of Existing Research on the Predictive Power of the DPS

Previous research has demonstrated the predictive power of the DPS in forecasting divorce outcomes [8]. Studies have reported significant associations between specific DPS items or dimensions and subsequent divorce, highlighting the utility of this scale in identifying potential risk factors for marital instability [9][10]. Furthermore, researchers have explored the use of advanced statistical techniques, such as neural networks and decision trees, to enhance the predictive accuracy of the DPS and improve divorce prediction models [11].

By reviewing the existing literature, this study aims to build upon previous findings and contribute to the understanding of the predictive capacity of the DPS. It also seeks to address any gaps or limitations in previous research and extend the knowledge base on the factors influencing marital stability.

## Data Source and Participant Characteristics

The data utilized in this study were sourced from a previous research paper that employed the Divorce Predictors Scale (DPS) to assess marital stability. The participant sample consisted of 84 (49%) divorced and 86 (51%) married couples. Along with completing the DPS, participants also provided personal information regarding demographic factors, relationship duration, and other relevant variables.

## Description of the Divorce Predictors Scale (DPS) and Its Items

The Divorce Predictors Scale (DPS) is a comprehensive questionnaire developed based on Gottman couples therapy principles. It consists of a set of items designed to measure various aspects of the marital relationship, including communication patterns, relationship compatibility, dynamics, and conflict resolution strategies. Each item is rated on a Likert-type scale, capturing the respondents' perceptions and experiences within their marriage.

## Overview of the Applied Statistical Analyses

Structural Equation Modeling (SEM) will be employed to examine the relationships among the different dimensions of the DPS and their associations with divorce outcomes. SEM allows for the testing of complex theoretical models and provides insights into the underlying mechanisms and pathways that contribute to marital stability or dissolution [12].

To enhance the predictive accuracy of the DPS, Bayesian prediction of categories will be utilized in this study. Bayesian methods offer a robust framework for capturing uncertainty and variability within the data, allowing for more accurate predictions of divorce outcomes. By incorporating prior knowledge and updating beliefs based on observed data, Bayesian techniques can improve the precision and reliability of divorce predictions [13].

Data mining techniques, including clustering analysis, will be employed to explore the underlying patterns and characteristics within the DPS dataset. Clustering analysis aims to identify distinct groups or clusters of individuals based on similarities in their responses to the DPS items. This analysis will provide insights into potential subgroups within the sample and reveal specific profiles or characteristics associated with marital stability or divorce risk [14].

By employing these statistical analyses, this study aims to assess the predictive power of the DPS, identify key factors influencing divorce outcomes, and explore the data mining properties of the DPS dataset.

## DPS Analysis Using PCC-SEM

Because items are all "positively" correlated with others and even with divorce, this study employs the Pearson Correlation Coefficient Structural Equation Modeling (PCC-SEM) approach to demonstrate the self-optimized structure among the items and their positive correlations with divorce. By utilizing PCC-SEM, we aim to provide a comprehensive analysis that captures the interrelationships and interdependencies among the variables, allowing for a more nuanced understanding of the underlying structure.

TABLE I. PEARSON CORRELATION COEFFICIENT (PCC) INTERPRETATION

| *r value* | *Interpretation* |
|---|---|
| r=1 | Perfect positive linear correlation |
| 1>r≥0.8 | Strong positive linear correlation |
| 0.8>r≥0.4 | Moderate positive linear correlation |
| 0.4>r>0 | Weak positive linear correlation |
| r=0 | No correlation |
| 0>r≥−0.4 | Weak negative linear correlation |
| −0.4>r≥−0.8 | Moderate negative linear correlation |
| −0.8>r>−1 | Strong negative linear correlation |
| r=−1 | Perfect negative linear correlation |

When examining the threshold upper limits of Pearson correlation coefficients (PCCs) between the following items and other connected items, certain patterns and observations emerge. As we move down the list, the correlation coefficients with other items tend to decrease, indicating weaker associations:

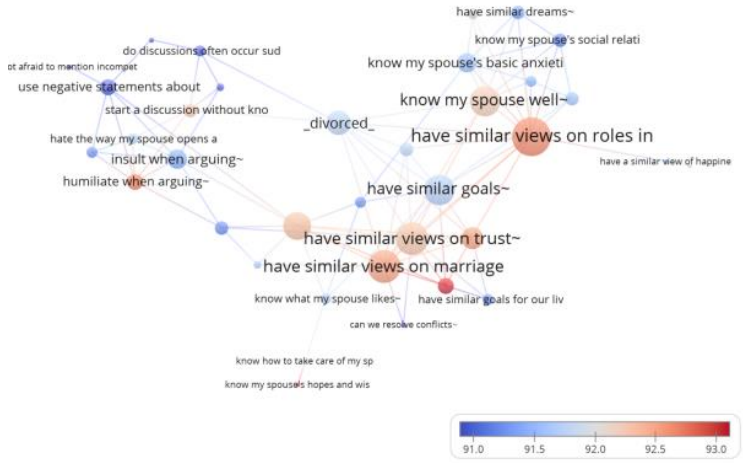



Fig. 1. PCC-SEM for Items with PCCs ≥ 0.9

PCCs < 0.9: Items such as "Can we compromise,""Can we have productive discussions,""Enjoy spending time together,""Feel aggressive when arguing,""Hesitate to mention inadequacy,""Not actually guilty of accusations,""Not at fault for accusations,""Not wrong about problems at home,""Remind of inadequacy when discussing,""Think it's good to leave home for a while," and "Use 'you always' or 'you never' when arguing" demonstrate

relatively high correlations with their respective connected items, but fall below a PCC of 0.9.

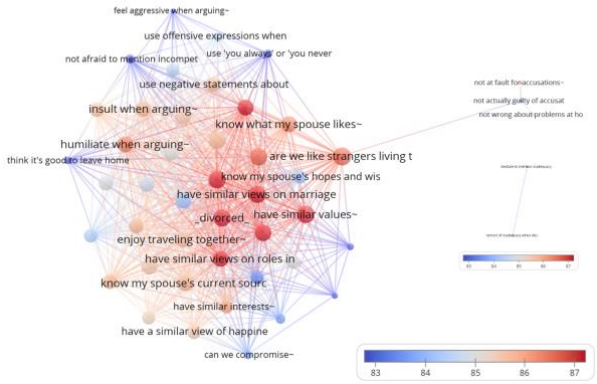



Fig. 2. P CC-SEM for Items with PCCs ≥ 0.8

PCCs < 0.8: Items such as "Feel right in discussions,""Prefer to stay silent than discuss,""Stay silent to calm the environment,""Stay silent when arguing due to fear of anger," and "Walk away and say nothing when arguing" exhibit slightly weaker correlations compared to the previous group but still maintain a moderate association with their connected items.

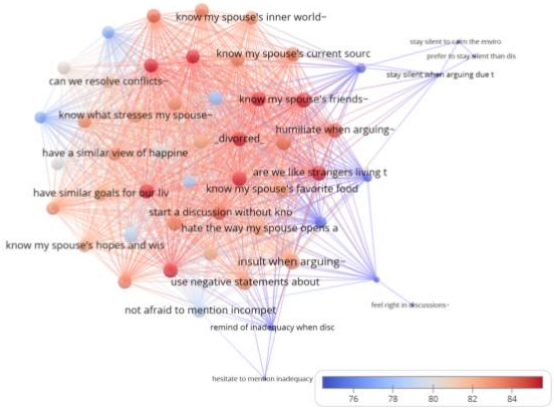



Fig. 3. PCC-SEM for Items with PCCs ≥ 0.7

PCCs < 0.7: The item "Stay silent even if right in the discussion to hurt" shows a further decrease in correlation, suggesting a weaker relationship with its connected items.

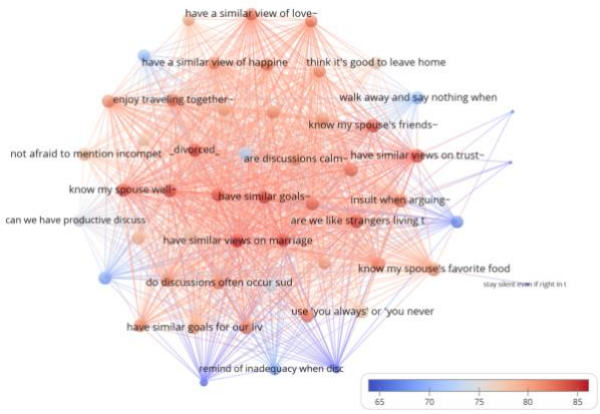



Fig. 4. PCC-SEM for Items with PCCs ≥ 0.6

PCCs < 0.6: Only the item "Enjoy vacations" has a correlation below 0.6, indicating a relatively weaker association with its connected items compared to the previous groups.

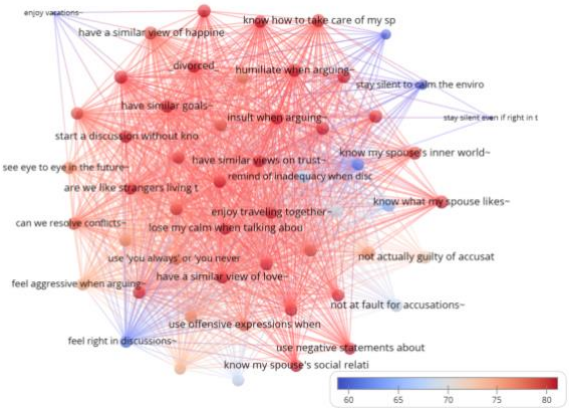



Fig. 5. PCC-SEM for Items with PCCs ≥ 0.5

PCCs < 0.5: The item "Have a good relationship" demonstrates the weakest correlation among the listed items, falling below a PCC of 0.5.

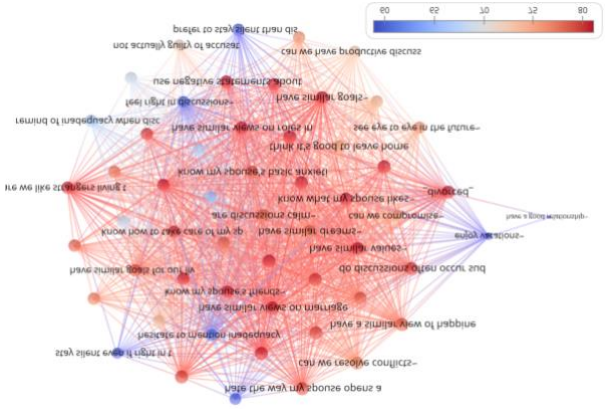


Fig. 6. PCC-SEM for Items with PCCs ≥ 0.4

PCCs < 0.4: No items are below this threshold level.

In the context of the study, it is observed that all the listed items have positive Pearson correlation coefficients (PCC) with the variable "divorce." This indicates that there is a positive relationship between "divorce" and each of the mentioned items. Items themselves also exhibit positive correlations with each other, with correlation coefficients greater than 0.4. Suggests that there are some associations and shared variance among the items. It is important to note that the presence of positive correlations does not imply causation or determine the strength of the relationships. Additional analysis and investigation are necessary to understand the nature and significance of these relationships more comprehensively.

By categorizing these questions, we can obtain a more descriptive PCC-SEM path diagram. These categories provide a comprehensive overview of the different aspects of the relationship that are captured by the PCC-SEM model. The path diagram visually represents the connections among the questions within each category, highlighting the interplay and relationships between various factors contributing to marital stability.

TABLE II. DPS CATEGORIES

| *Category of DPS* | *Number of Questions* |
|---|---|
| *Care for Spouse* | 1 |
| *Relationship Satisfaction* | 2 |
| *Leisure Activities* | 2 |
| *Self-reflection* | 3 |
| *Relationship Dynamics* | 6 |
| *Relationship Compatibility* | 6 |
| *Knowledge of Spouse* | 11 |
| *Communication* | 13 |

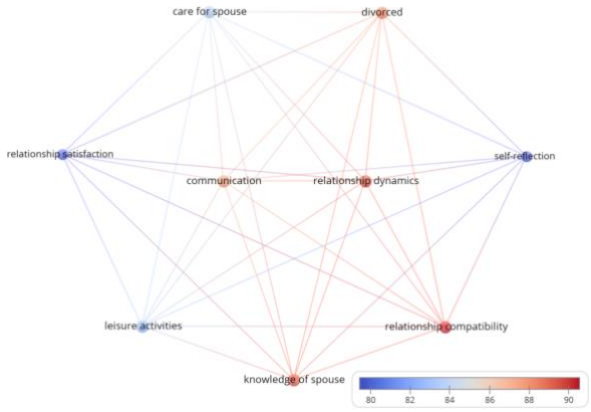



Fig. 7. PCC-SEM interrelationships among categories

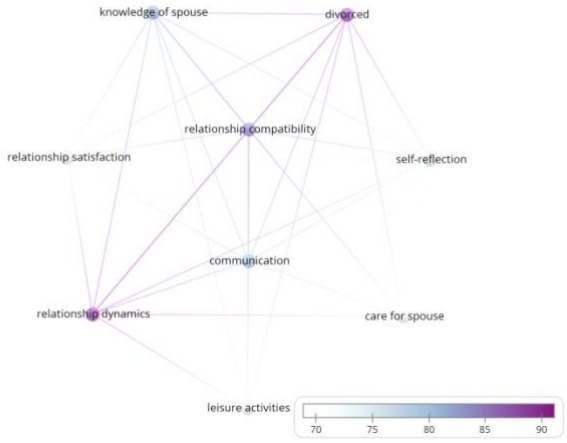



Fig. 8. Mediation-SEM interrelationships among categories

## Findings From the Data Mining and Clustering Analysis

Decision tree features after k-means into 2 clusters: Our dataset was divided into two clusters using the k-means clustering algorithm. Cluster 0 consisted of 80 items, while Cluster 1 comprised 90 items, resulting in a total of 170 items.

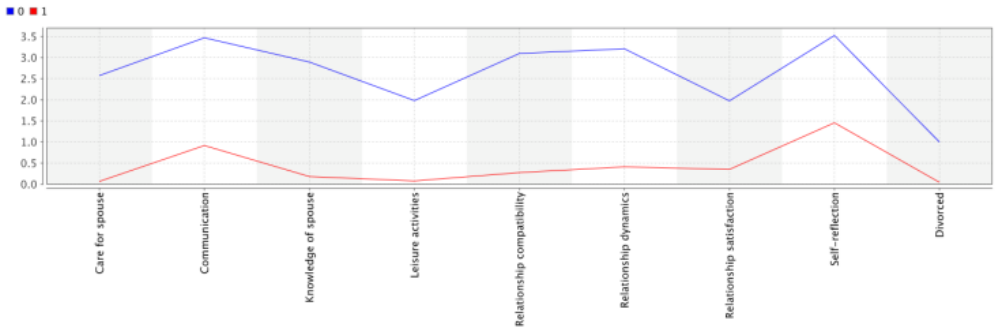



Fig. 9. Average scores after k-means into 2 clusters

A decision tree was constructed based on the clustering results, considering the feature "Relationship compatibility." If the relationship compatibility value was greater than 1.636, the instance was assigned to Cluster 0, with 80 items belonging to this cluster and none in Cluster 1. On the other hand, if the relationship compatibility value was less than or equal to 1.636, the instance was assigned to Cluster 1, with 90 items belonging to this cluster and none in Cluster 0.

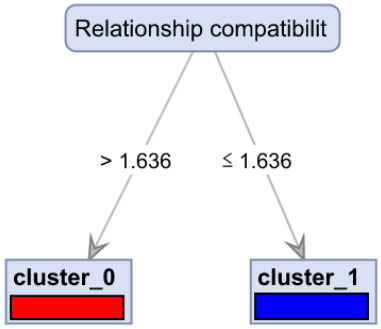



Fig. 10. DT variations between the two clusters

Decision tree features for divorce prediction: Our decision tree presented aims to classify individuals as either divorced (divorced = 1) or non-divorced (divorced = 0) based on their responses to certain features. The tree can be interpreted as follows:

- If an individual's "Relationship compatibility" is greater than 1.227, they are classified as divorced (divorced = 1). At this node, 81 individuals are classified as divorced, with no individuals classified as non-divorced (divorced = 0).
- If an individual's "Relationship compatibility" is less than or equal to 1.227, further analysis is performed based on additional features.
- If an individual's "Relationship dynamics" is greater than 1.375, they are classified as divorced (divorced = 1). At this node, one individual is classified as divorced, while one individual is classified as non-divorced (divorced = 0).
- If an individual's "Relationship dynamics" is less than or equal to 1.375, additional analysis is conducted based on other features.
- If an individual's "Relationship compatibility" is greater than 0.682 and their "Communication" is greater than 1.024, they are classified as divorced (divorced = 1). At this node, two individuals are classified as divorced, with no individuals classified as non-divorced (divorced = 0).
- If an individual's "Relationship compatibility" is greater than 0.682 and their "Communication" is less than or equal to 1.024, they are classified as non-divorced (divorced = 0). At this node, six individuals are classified as non-divorced, with no individuals classified as divorced (divorced = 1).

- If an individual's "Relationship compatibility" is less than or equal to 0.682, they are classified as non-divorced (divorced = 0). At this node, 79 individuals are classified as non-divorced, with no individuals classified as divorced (divorced = 1).

This decision tree employs features such as "Relationship compatibility,""Relationship dynamics," and "Communication" to perform classification, utilizing different threshold values for each feature. By following this decision tree, individuals can be categorized into divorced or non-divorced groups based on their feature values.

TABLE III. DT RULES OF DIVORCE OR NOT

| *Condition* | Class | Count |
|---|---|---|
| *Relationship compatibility > 1.227* | 1 | 81 (divorced) |
| *Relationship compatibility ≤ 1.227* | | |
| *Relationship dynamics > 1.375* | 1 | 1 (divorced)<br>1 missed~ |
| *Relationship dynamics ≤ 1.375* | | |
| *Relationship compatibility > 0.682* | | |
| *Communication > 1.024* | 1 | 2 (divorced) |
| *Communication ≤ 1.024* | 0 | 6 |
| *Relationship compatibility ≤ 0.682* | 0 | 79 |

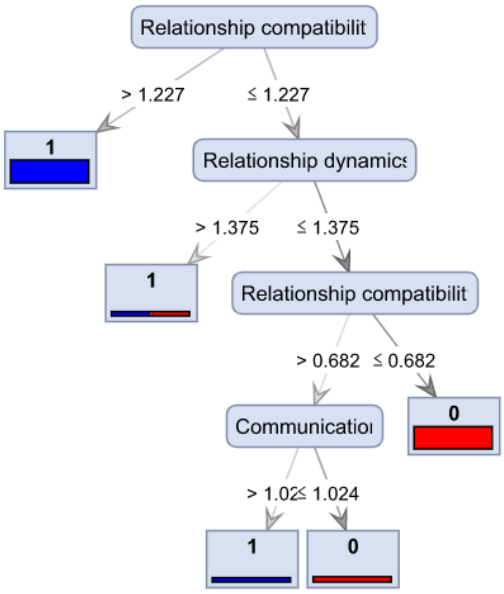



Fig. 11. DT plot of divorce or not

## Evaluation of the Bayesian Prediction of Categories Modelling Technique

Our Naive Bayes classifier was trained using a Frequency Model. There were a total of 136 instances used for training. The model consists of two classes labeled "Marital Maintenance" and "Divorce."

Each class has a corresponding prior probability. The prior probability for the "Marital Maintenance" class is -0.6642, and for the "Divorce" class, it is -0.7230. The model includes 55 attributes, which record the frequency of occurrence of each attribute in the training data.

A "probabilities" section of the model contains the probability values for each attribute in each class. For example, for the "Divorce" class, the probability value for attribute 'Atr34' is -3.8979, and for attribute 'Atr6' it is -4.8681 , and so on. Similarly, the probability values for each attribute are listed for the "Marital Maintenance" class as well.

And "smoother" section of the model includes the values used for smoothing to handle potential zero probabilities. For the "Divorce" class, the smoothing value is -9.2869, and for the "Marital Maintenance" class, it is -7.6592.

Our randomly selected test set of 34 instances was used to validate the training results, resulting in an accuracy of 100%. By using the same algorithm, it is easy to reproduce such accuracy.

Differences between the two groups of data, "Not Divorced" and "Divorced," can be compared in several aspects:

- Care for Spouse: The average score for individuals who are not divorced is 0.069, whereas the average score for those who are divorced is 2.452, indicating a significant difference between the two groups.
- Communication: Individuals who are not divorced have an average score of 0.892, while those who are divorced have an average score of 3.374, indicating higher scores for divorced individuals in terms of communication.
- Knowledge of Spouse: The average score for individuals who are not divorced is 0.162, whereas the average score for those who are divorced is 2.785, indicating higher scores for divorced individuals in terms of understanding their spouse.
- Leisure Activities: Individuals who are not divorced have an average score of 0.070, while those who are divorced have an average score of 1.899, indicating higher scores for divorced individuals in terms of engagement in leisure activities.
- Relationship Compatibility: Individuals who are not divorced have an average score of 0.251, while those who are divorced have an average score of 2.989, indicating higher scores for divorced individuals in terms of relationship compatibility.
- Relationship Dynamics: Individuals who are not divorced have an average score of 0.375, while those who are divorced have an average score of 3.113, indicating higher scores for divorced individuals in terms of relationship dynamics.
- Relationship Satisfaction: Individuals who are not divorced have an average score of 0.320, while those who are divorced have an average score of 1.929, indicating higher scores for divorced individuals in terms of relationship satisfaction.
- Self-reflection: Individuals who are not divorced have an average score of 1.426, while those who are divorced have an average score of 3.456, indicating higher scores for divorced individuals in terms of self-reflection.
- Standard Error: The standard error for individuals who are not divorced is smaller compared to the standard error for individuals who are divorced. This indicates that the measurements for various indicators in the data for individuals who are not divorced are more consistent.
- Median: The median for individuals who are not divorced is generally lower, while the median for individuals who are divorced is higher. This suggests that divorced individuals tend to have higher scores in many indicators.
- Mode: The mode for individuals who are not divorced is generally 0, while the mode for individuals who are divorced is higher in most indicators. This indicates that divorced individuals tend to give higher scores in many indicators.

- Standard Deviation: The standard deviation for individuals who are divorced is higher, while the standard deviation for individuals who are not divorced is lower. This indicates that scores for divorced individuals are more dispersed across various indicators, while scores for individuals who are not divorced are more concentrated.
- Kurtosis: The kurtosis value for individuals who are not divorced is generally higher, while the kurtosis value for individuals who are divorced is lower. This indicates that scores for individuals who are not divorced are more concentrated in many indicators, while scores for divorced individuals are more dispersed.
- Skewness: The skewness value for individuals who are not divorced is generally positive, while the skewness value for individuals who are divorced is generally negative. This suggests that scores for individuals who are not divorced tend to be positively skewed in many indicators, while scores for divorced individuals tend to be negatively skewed.
- Range: The range for individuals who are not divorced is generally smaller, while the range for individuals who are divorced is larger. This indicates that scores for divorced individuals have greater variation across various indicators.

## Conclusion

Given that divorced individuals tend to score higher in most aspects, this suggests that they may place more emphasis on care for their spouse, communication, understanding of their partner, engagement in leisure activities, relationship compatibility, relationship dynamics, relationship satisfaction, and self-reflection. Individuals who are not divorced tend to have lower and more consistent scores across various indicators, while individuals who are divorced tend to have higher scores in many indicators with greater dispersion. Due to the personal and sensitive nature of marriage, individuals who are not divorced may be more cautious when filling out questionnaires regarding marital content. They may wish to protect their privacy and be hesitant to disclose too much personal information or feelings. This cautious attitude can lead to their choosing not to answer certain questions or providing lower ratings. Additionally, there may be other reasons why individuals who are not divorced are reluctant to respond to questionnaires about marital content. For example, they may be concerned that others might have access to the questionnaire results and worry about potential adverse consequences or unnecessary disputes. They may also fear that the questionnaire results will be used to evaluate their marital status or serve as evidence in divorce cases. In conclusion, due to the private nature of marriage, individuals may choose to protect their privacy and refrain from answering questionnaires about marital content. This is a reasonable response that needs to be taken into account when designing survey questionnaires, respecting individuals' privacy rights, and honouring their wishes and choices .

## Acknowledgements

Sincerely would like to express my heartfelt gratitude to my supervisor, for her guidance and support throughout this project. I would also like to thank my family and friends for their unwavering encouragement and understanding during this challenging time.

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# *Caring in the Shadows: Exploring the Lived Experiences of Indigent Primary Caregivers of Patients With Schizophrenia in Rural Philippines*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
Diagnosis within the schizophrenia spectrum places a huge burden not only on the patients but also on their caregivers, who live with them and interact with them regularly. This qualitative phenomenological study is about the lived experiences of indigent primary caregivers of patients diagnosed with schizophrenia spectrum disorders in General Luna, Quezon Province, Philippines. Ethical standards of trustworthiness and rigor were followed. The data gathering was accomplished through unstructured one-on-one interviews with seven (7) participants, who were purposively chosen using criterion sampling. Narratives were transcribed and analyzed using Smith et al.'s (2009) interpretative phenomenological analysis. The study revealed four (4) major superordinate themes: (1) Guided by Culture: Embracing the Caregiving Journey with Filipino Values; (2) Emotions Unveiled: Mapping the Emotional Trajectory of Caring; (3) Unseen Warriors: Fighting Silent Battles and Overcoming Untold Struggles; and (4) Boundless Devotion: Navigating the Altruistic World of the Primary Caregivers. Findings showed that participants' experiences underscore the profound impact of Filipino cultural values on the caregiving experience and emphasize the emotional complexity of caregiving for individuals with schizophrenia. There were also challenges and difficulties faced by the participants. Their altruistic world involves the immense sacrifices they make, the transformative impact on their identities, and the coping strategies they employ to navigate the challenges they face. The insights gained from the participants can inform tailored support systems and interventions, benefiting similar caregiving situations. The study has implications for improving mental health programs and aiding both patients and caregivers.

Keywords: Schizophrenia Spectrum Disorders, Primary Caregivers, Mental Health, Indigenous Psychology, Interpretative Phenomenological Analysis, Philippines

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## 1. Introduction

Schizophrenia is the most debilitating of all mental health problems in its most severe form and is also the most expensive mental disorder per person from an economic standpoint (World Health Organization [WHO], 2022). According to the Global Burden of Disease Study 2019, which was published by the WHO (2022), the global prevalence of schizophrenia is 2.5%, affecting 24 million of the global population and approximately 1 in 200 adults, making it the primary concern of mental health services in all countries. Since it is the most impairing of all mental health conditions in its acute states, schizophrenia places a huge burden not only on the individuals afflicted but also on the people closest to them, most specifically the caregivers who live with them and interact with them regularly. The global trend of deinstitutionalizing mental health and prioritizing community-based care resulted in making family caregivers indispensable in the management of schizophrenia (Hajebi et al., 2019). In the majority of underdeveloped and developing countries like the Philippines, community care services are inadequately prepared to meet the needs of these patients and their families, or informal caregivers. With that, not only patients but also their caregivers experience different problems and challenges along the way. The researcher found it significant to understand and go deeper into the lived experience of the primary caregivers of patients diagnosed with schizophrenia spectrum disorder, especially those who are from low-income families in rural areas of the Philippines. Particularly, the researcher purposively chose the beneficiaries of the "We Care Program", a local government of General Luna Quezon initiative program launched in 2020. The program aimed to support indigent families in caring for their loved ones with mental health conditions (Mallari, 2020). The research paper intends to determine insights from the experiences of the indigent primary caregivers from which themes will emerge as the findings of the study. The findings of this study aim to inform mental health care practices to support not only patients but also caregivers. The results and output of the study can be used to improve the current implementation of different mental health programs in the province and can be used as a basis for improvement to help not only the patients but also the primary caregivers.

## 2. Literature Review

### 2.1 Family Caregiving of Patients With Schizophrenia

Due to deinstitutionalization and the rise of community-based mental health services, primary caregivers have assumed greater responsibility for individuals diagnosed with schizophrenia. This shift has considerable effects on families, involving both emotional and financial strains. A quantitative study by Rahmani et al. (2022) investigated the caregiving burden and its determining factors among family caregivers of schizophrenia patients. The findings indicate that a substantial caregiving burden was experienced by family caregivers, with 38.2% reporting a severe burden. The responsibility of caring for a relative with schizophrenia gives rise to emotional shock and burden, inadequate understanding of the illness and care techniques, challenges in patient medication adherence, interpersonal difficulties, conflicts in family or work settings, financial strain, and the necessity for robust social support (Iswanti & Pandin, 2022). Recent investigations have also delved into the requirements, obstacles, and techniques for managing challenges among primary caregivers of individuals with schizophrenia. Isaac et al. (2022) conducted a comprehensive review and meta-synthesis encompassing 38 studies involving 543 participants. The findings reveal that the primary caregivers' necessities encompassed rehabilitation and job training centers, informative

resources, support groups, improved healthcare provisions, and enhanced communication and cooperation (Isaac et al., 2022).

Furthermore, Isaac et al. (2022) highlighted those difficulties such as "treatment expenses, unconventional beliefs, self- and other-related harm, noncompliance with therapy, demanding caregiving duties, strained family relationships, misunderstanding and bias, and self-stigmatization" were encountered. Additionally, they observed that problem-focused coping, emotional coping, behavioral strategies, reliance on social support, religious coping, and cognitive reevaluation were the mechanisms adopted (Isaac et al., 2022). Stanley and Blakrishnana (2022) conducted a study focusing on the pivotal role of family caregivers in supporting individuals with mental health conditions like schizophrenia. Through a quantitative approach, they assessed the stress levels, perceived social support, resilience, and life satisfaction of caregivers responsible for individuals diagnosed with schizophrenia. The study involved 75 caregivers from southern India and employed standardized assessment tools to gauge these essential factors. Regression analyses indicated that while social support doesn't directly alter the impact of stress on resilience, resilience functions as a mediator between stress and life satisfaction.

In caring for a loved one with schizophrenia disorders in a Filipino family setting, Martinez et al. (2020) found that despite facing significant levels of psychological distress, Filipinos across the globe typically steer clear of formal help-seeking avenues and possess a generally unfavorable perspective towards such options. They tend to lean toward seeking assistance from close friends and family members. While Filipinos living in the Philippines mention barriers related to finances and service accessibility, overseas Filipinos face additional challenges related to immigration status, absence of health insurance, language barriers, instances of discrimination, and challenges in adapting to the host culture. Both groups encounter the stigma associated with mental illness, along with concerns about preserving their reputation, feelings of embarrassment, and adherence to cultural values that prioritize conformity to norms, making mental illness socially unacceptable.

## 2.2. Conceptual Framework

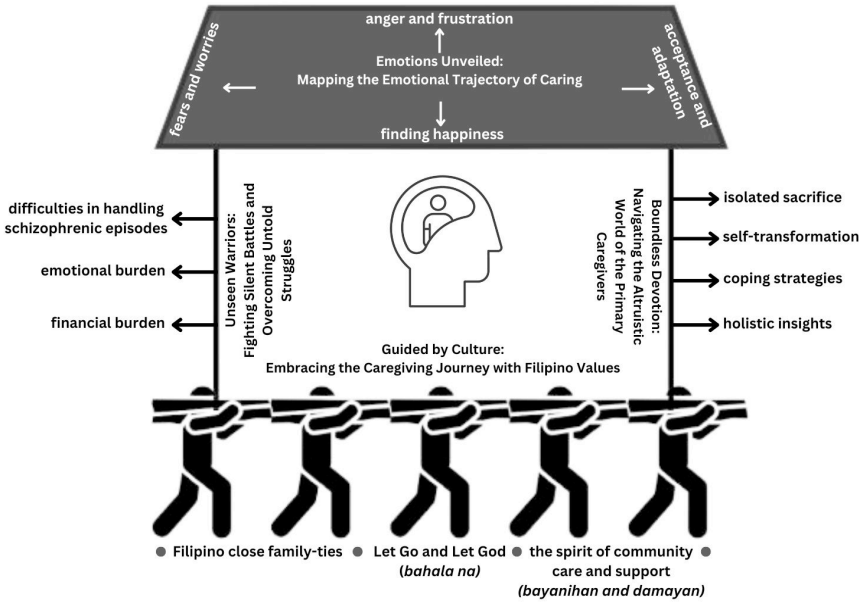



Figure 1. Thematic Scheme of the Lived Experiences of Indigent Primary Caregivers of Patients with Schizophrenia

This study explored the experiences of indigent primary caregivers of patients with schizophrenia disorders, resulting in a conceptual framework inspired by the traditional Filipino Bahay Kubo (Nipa Hut). This framework highlights the economic, emotional, and cultural challenges faced by caregivers, emphasizing the need for greater support.

Guided by Filipino values like close family ties, let go and let god, ('bahala na'), and community spirit ('bayanihan'), caregivers navigate a complex emotional landscape. They experience anger, fear, and frustration, but also find acceptance, adaptation, and moments of happiness.

Despite facing schizophrenic episodes, emotional strain, and financial burdens, caregivers persevere as 'unseen warriors'. Their altruism leads to profound self-transformation and the development of coping strategies. While their sacrifices can lead to isolation, caregivers ultimately gain deeper insights, empathy, and personal growth. This study underscores the challenges faced by this marginalized group and advocates for increased resources and understanding of their experiences.

## 3. Methodology

The study employed a qualitative phenomenological research design to delve into the lived experiences of primary caregivers of schizophrenia patients. The data were analyzed using interpretative phenomenological analysis (IPA) based on the methodology and principles constructed by Smith et al. (2009. Seven (7) participants were chosen through purposive and criterion sampling. In line with the IPA's best practice guidelines on the idiographic principle, this study worked with a small sample size that is homogenous in characteristics (Pietkiewicz & Smith, 2012). In this way, the generalizability of the findings was limited, but a richer, more in-depth case-by-case analysis would be gained (Smith et al., 2009). Participants were selected using the following inclusion criteria:

1) A primary caregiver (18 years old and above) of a patient diagnosed with schizophrenia spectrum disorder.
2) Be able to communicate efficiently and be willing to participate in research.
3) Comes from an indigent family and is a beneficiary of the We Care Program.

Unstructured interviews, which lasted from 30 minutes to 2 hours, were conducted, recorded, and transcribed. IPA seven-step data analysis, as shown in Figure 2, involved immersing in the data, identifying emergent themes, and developing superordinate and subordinate themes across cases (Smith et al., 2009). The analysis deepened themes with literature, conceptual frameworks, and symbolic representation. The study adhered to ethical guidelines and aimed to understand the experiences of primary caregivers of patients diagnosed with schizophrenia in General Luna, Quezon, bridging broad knowledge with individual perspectives.




Figure 2. The seven steps of IPA Data Analysis
Source: Charlick, McKellar, Fielder, & Pincombe (2016), adapted from Smith et al. (2009)

## 4. Findings and Discussion

### Themes

#### *Superordinate Theme 1: Guided by Culture*

This superordinate theme highlights the interplay between Filipino cultural values and the caregiving experience through identification from three subordinate themes: (1) Filipino Family-Ties (2) Let Go and Let God; and (3) The Spirit of Community Care and Support.

**Filipino Family-Ties**. As immediate family members, several participants believe that no one else but them is responsible for caring for the patients. Mutya, who has been caring for her brother because their parents are both deceased, fully embraced the responsibility as the eldest. Makisig, who has been caring for her mother for more than a decade, further elaborated that:

> *"The immediate family of people with schizophrenia should understand their situation with patience, empathy, and compassion more than anyone else. The first ones to provide care and understanding for them [patients] should be their children, parents, or siblings; it's their responsibility, no one else's. It's our familial obligation that we should not escape from."*

**Let Go and Let God.** It is common among the participants to surrender their worries, anxieties, and burdens to a higher power. Participants acknowledge that when caring for a family member with schizophrenia, accepting the limitations of one's control is crucial. The phrase "bahala na" was often mentioned in the participants' verbatim. Ligaya shared that:

> *"I accept that there are things beyond my control, so I entrust them to God. I pray, 'Lord Almighty, I let go and surrender this to you.' My faith in God helps me care for my daughter."*

**The Spirit of Community Care and Support.** This subtheme addresses the Filipino values of "bayanihan" and "damayan", and how the participants attribute this to their caregiving journey through practical assistance and local government mental health advocacy. Narda recalled how the neighbors, barangay patrols, the barangay captain, and the police helped her bring her daughter to safety, where the doctor injected the patient with antipsychotics. She further elaborated on how reliable the community was in her situation at the onset of her son's schizophrenia symptoms.

> *"I ran, asking for help from... the police... I asked for help from the police. And I had someone from DSWD (Department of Social Welfare and Development) with me. There were escorts—two police officers and one DSWD personnel. Free transportation, free food, and free medical assistance. I'm grateful to them because they didn't abandon me. Especially Mayor. It really just takes one call for help. He gave me money, and I went home late at night, so happy. "Thank God" I keep saying that because I was able to buy medication."*

***Superordinate Theme 2: Emotions Unveiled***

This theme explores and maps the emotional trajectory that the participants have been going through while caring for a loved one with schizophrenia. Four (4) subordinate themes emerged under this theme: (1) anger and frustration; (2) fears and worries; (3) acceptance and adaptation; and (4) finding happiness.

**Anger and Frustration.** In the early phases of taking on the caregiving role, anger and frustration were expressed by the primary caregivers, mostly toward other people, the patient, and the situation. Ligaya shared:

> *"I was angry and annoyed at my co-parents-in-law. It seemed like they didn't care about their daughter's-in-law's illness. They left me alone and didn't provide any form of support. I was so frustrated."*

Participants who are the primary caregivers of their married son with schizophrenia mentioned how angry and frustrated they were with their daughters-in-law. In their narratives, they described how their daughters-in-law neglected rather than cared for their sons, leaving them with no choice but to assume the responsibility.

**Fears and Worries**. Several participants described having fears and worries as they navigated the care and support of their loved ones. They worry about the patient's risk of self-harm or harm to others. Maya further elaborated that:

> *"He started feeling uneasy back then, and he lost significant weight. He wouldn't eat, rarely took a bath, things like that. And sometimes, he would spit at people who passed by... That's when I started worrying, and we sought help. I had him confined in a psychiatric ward. I was afraid he might harm others or himself, so I asked the police for assistance to take him because he didn't want to come along."*

**Acceptance and Adaptation.** Participants eventually reached a point of acceptance and adaptation. Their experiences lead them to acknowledge the reality of the situation as they accept it. Maya shared:

> *"Sometimes, of course, there are times when you get angry, but afterwards, I realize that it shouldn't have been that way. Because that's what the doctor told me. His doctor advised me never to make him angry, and never scold him, so he won't become aggressive... [His condition has been explained to me.] I've been taking care of him for a long time, on and off schizophrenic episodes. He gets better, then he relapses. It's a cycle, as the doctor said. ] I've become accustomed to it, in a way, because if that's how it is, there's no one else to take care of him but me."*

**Finding Happiness in Small Moments.** One of the common shared experiences among the participants is finding happiness in small moments in their caregiving journey amidst the unique challenges of caring for a family member with schizophrenia. They take time to appreciate the small things that bring them joy and a sense of relief, like a moment of connection or a day without an episode. Makisig finds joy in moments like sharing a meal or being silly and playful with her mother. In those moments, his bond with his mother grows. Some participants find happiness on days when the patient is in a good mood or on a day without an episode. Maya expressed appreciation toward his son and shared that:

> *"He can be affectionate sometimes, [he'll say], 'Mama, I bought you food' ...Sometimes I see him washing the dishes, I'd say to myself, "oh thank goodness, his mood is good!" Sometimes he voluntarily takes a bath. He'll say, 'Ma, I already took a bath, give me some money.' He does those things. I find precious joy with those moments."*

Participants also find happiness in witnessing a positive change in their loved one's condition. Tala described the feeling of knowing there's a positive change in his son's condition as feeling like "a large thorn was removed from her chest".

***Superordinate Theme 3: Unseen Warriors***

This third superordinate theme contains the difficulties and burdens the participants face in the caregiving role. This theme arises from three subordinate themes: (1) Dealing with Schizophrenic episodes; (2) Emotional burden; and (3) Financial burden.

**Dealing With Schizophrenic Episodes.** Participants had to handle schizophrenic or psychotic episodes where the patients exhibited aggression and violence, delusions, paranoia, hallucinations, or social withdrawal. It manifested differently among the patients, but it certainly was challenging and distressful for all the primary caregivers. Narda shared:

> *"Oh my God! I tell you; I melt down and cry uncontrollably! Oh mother! There are times that I could not sleep, especially when she doesn't have her medication, because her psychotic episode involves punching and slapping me when I'm fast asleep at night. It scares me! Oh my God, she even pulled me and dragged me on the floor once!"*

**Emotional Burden.** Caring for a family member with schizophrenia is emotionally challenging for the participants. Feelings of helplessness and sadness are common, further

increasing the emotional burden and negatively impacting the caregiver's mental well-being. Coming from low-income households, providing care leads to exhaustion, burnout, and neglect of one's own needs, further adding to the emotional burden. Due to her heavy emotional burden, Perla thought of giving up. She elaborated:

> *"I get stressed but even if I'm stressed, I can't neglect him because if I do, things might get worse. I want to end the burden, all of it. I thought about ending my life, but then I thought if I'm gone, my poor son, my daughters will be left alone. If I kill myself, how about him? No one would take care of him. So, I still worry about him... his future. Honestly, I'm exhausted from taking care of him. I'm so tired, it's so hard to cope. I just thought, if I do that thing [suicide], first and foremost, it's a sin... it's a sin against God... so I ignore everything, and I just continue even if it's challenging, for my son's healing as well."*

**Financial Burden.** Participants emphasized how caring for a family member with schizophrenia significantly contributed to their already existing financial difficulties, given that they are from a low-income class. It is a constant struggle to make ends meet, especially since maintenance medications are needed for an illness with a lifetime course. Tala said:

> *"The most difficult part is first, finding money for his treatment in the psychiatric ward. Second, the expensive maintenance medication that he needs to take for the rest of his life. That's what concerns me, I keep on worrying about it. There's nothing left to sell, not even a single livestock. Right now, only the maintenance medication is what he needs to alleviate his symptoms and make him high-functioning, and I think about it especially when it's the start of a new month. I think about where I can get that much money because I have no source of income, considering how expensive the medication is."*

Due to financial constraints, Narda shared that asking for financial and medical assistance from government agencies has been part of her routine.

### *Superordinate Theme 4: Boundless Devotion*

This superordinate theme was unfolded from the four subordinate themes under it, such as (1) Isolated Sacrifice, (2) Self-transformation, (3) Coping Strategies, and (4) Holistic Insights. This superordinate theme highlights the altruistic nature of being the primary caregiver of a family member suffering from schizophrenia.

**Isolated Sacrifice.** Assuming the responsibility of caring for their loved ones with schizophrenia means sacrificing. In this way, participants often experience a sense of isolation in their caregiving role. Caregivers may have limited opportunities for social interactions outside the caregiving context. Maya stated that:

> *"I really should not be here; I should be retiring in my other children's homes in Manila. I just can't leave him behind because there's no one else to take care of him but me. No one else can cook him food, take care of him, or even do his laundry. It's all me who does that, so he can be safe from the psychotic episode's triggers. It's a real sacrifice. Even my sibling invited me to go to another country for a vacation, but I couldn't do it because of him. I can't leave him. I really do need a break. Oh, I can't even do it because I have to take care of him."*

**Self-Transformation.** Despite the immense challenges and sacrifices involved in the caregiving journey, participants have undergone significant changes within themselves that shape their perspectives, strengths, and abilities. Makisig shared that:

> *"Before, my patience was short, but now I've stretched it as long as I could."*

Maya also shared that the caregiving role also brought changes to her identity:

> *"The old me is gone. I used to be happy. I was cheerful, and I used to have a stall in the wet market where I was doing good, but now I can't leave him on his own, and it's like I'm focused on him because he is dependent on me due to his illness. My attention is solely on him."*

**Coping Strategies**. Participants shared various mechanisms they employed to navigate and cope with the demands and stresses associated with caring for a family member with schizophrenia in a low-income household. Participants reach out to friends, family members, or support groups. Taking time to prioritize their own physical, emotional, and mental well-being is crucial for maintaining resilience. Tapping on their inner strength helps them cope. Tala shared that:

> *"But what if I get sick too? If the one I'm taking care of is already sick, then we'll both be sick. I just strengthen my mind, body, and spirit because I think if I give in, if I let it overwhelm me, then what will happen to us? We'll have nothing left... That's the end of it."*

**Holistic Insights.** In this subordinate theme, participants shared some profound understanding and wisdom that they developed as they navigated the complexities of schizophrenia and its impact on their lives. They empathize with others who may be facing similar challenges. Participants gain a non-judgmental perspective as they witness the complexity of schizophrenia and its impact on their family member's behavior and well-being. Makisig shared that:

> *"Maybe those who are sick are the ones who don't understand [mental illness] with empathy and compassion. That's a more severe illness than having schizophrenia. I pity those who place stigma on mental health; they're the ones who should know better. Those families who have loved ones suffering from a mental disorder, if possible, don't exhaust your patience; always have some left; always have reserves; if possible, increase it even more."*

## Discussion

### *Guided by Culture: Embracing the Caregiving Journey With Filipino Values*

Filipino culture, with its emphasis on strong family ties, religious faith, and community support, deeply shapes the experience of caring for individuals with schizophrenia. Family members feel an inherent cultural obligation to care for their loved ones (Ignacio et al., 2020). This responsibility often falls primarily on parents, who are motivated by unconditional love and a sense of duty (Liu & Zhang, 2020).

The Filipino concept of bahala na ("leave it to God") provides caregivers with a sense of humility and trust in a higher power (Jiolito, 2022). Rather than being a passive resignation, bahala na instills inner strength to face challenges (Magilan, 2019). This religious faith allows caregivers to accept their loved one's condition, find meaning in their caregiving journey (Casaleiro et al., 2022; Kamarulbahri et al., 2022), and cope with the associated burdens. Participants in this study seek help from medical professionals rather than traditional healers, which contrasts with findings from other studies that show a reliance on religious rituals for healing (Martinez et al., 2020).

The Filipino values of bayanihan (community support) and damayan (compassion) are crucial. These values encourage neighbors and community members to offer practical and emotional assistance to caregivers, helping to ease the burdens of caregiving (Aruta et al., 2022; Casaleiro et al., 2022). The kindness shown by those around the participants, combined with a lack of discrimination, has been instrumental in enabling these families to thrive (Redubla & Cuaton, 2019).

### *Emotions Unveiled: Mapping the Emotional Trajectory of Caring*

Caregivers experience a wide range of emotions, including anger, frustration, fear, and worry. In the early stages, anger may be directed at others or the situation itself (Narayanan, 2021; Estradé et al., 2023). Worries about the patient's future—their well-being, employment, and relationships—are also common. The intensity of these fears can fluctuate depending on the patient's condition and the occurrence of acute episodes (Cleary et al., 2020). Over time, acceptance and adaptation emerge. Caregivers learn to manage their anger and adjust to a new normal (Imkome & Waraassawapati, 2018). Participants describe finding joy in small moments, such as when patients respond positively to treatment, gain insight into their condition, or show love and appreciation (Liu & Zhang, 2020; Redubla & Cuaton, 2019).

### *Unseen Warriors: Fighting Silent Battles and Overcoming Untold Struggles*

Caregivers of individuals with schizophrenia face significant hidden challenges. Dealing with episodes involving aggression, delusions, hallucinations, and social withdrawal can be particularly difficult (Iswanti et al., 2022). These episodes place stress on both caregivers and patients, influencing quality of life for all involved. The emotional burden on caregivers is considerable, with feelings of helplessness and sadness being prevalent (Cleary et al., 2020; Kamil & Velligan, 2019; Rahmani et al., 2022; Liu & Zhang, 2020). These challenges are amplified for low-income families, where the financial costs of care can be overwhelming. Limited resources can lead to caregiver burnout and neglect of their own needs (Arun et al., 2018; Cleary et al., 2020; Siddiqui & Khalid, 2019; Manao & Pardede, 2019).

### *Boundless Devotion: Navigating the Altruistic World of the Primary Caregivers*

This study highlights the sacrifices and profound transformation experienced by those who care for individuals with schizophrenia. Caregivers often feel isolated due to the all-consuming time and energy required by their role (Estradé et al., 2023; Liu & Zhang, 2020; Bademli & Lök, 2020). Despite these challenges, the journey leads to personal growth. Caregivers develop deep empathy, allowing them to provide compassionate mental health support. They may experience a shift in their own priorities and identities as their focus centers on their loved one (Dijkxhoorn et al., 2022). Caregivers utilize various coping strategies, such as seeking social support, engaging in self-care, and relying on their inner

strength (Bademli & Lok, 2020; Liu & Zhang, 2020). Through their experiences, caregivers gain a broader perspective on life and its challenges, often developing a deeper appreciation for resilience and compassion.

## 5. Conclusion

The study contributed to the deep understanding of the lived experiences of the indigent primary caregivers of patients diagnosed with schizophrenia spectrum disorders, particularly those from indigent families in General Luna, Quezon Province, in the Philippines. The findings highlight the profound impact of Filipino cultural values on their caregiving journey, shaped by cultural factors such as strong family bonds, faith in God, and a sense of community care. Despite the emotional complexity inherent in caring for individuals with schizophrenia, these caregivers demonstrate remarkable resilience, adaptability, and the ability to find moments of happiness within their roles. They navigate through a spectrum of challenges, encompassing the management of schizophrenic episodes, the emotional toll of caregiving, and the financial strains linked to the condition. Serving as primary caregivers in such circumstances is an inherently altruistic endeavor, involving significant sacrifices, transformative self-discovery, and the application of coping mechanisms to surmount obstacles. The insights gleaned from these caregivers' experiences hold immense potential for the development of tailored support systems and interventions to address the unique needs of other individuals in similar caregiving roles. The study offers several recommendations, urging the recognition of cultural values in healthcare services, the incorporation of family caregivers in mental health policies, the integration of faith-based approaches, fostering community engagement, enhancing mental health services, and encouraging further research to strengthen local mental health policies.

## Acknowledgments

The authors acknowledge the generous support of the Rural Health Unit of General Luna Quezon in the Philippines in the facilitation of this research. Their mental health program was instrumental in connecting the researchers with the study participants.

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# *Why Do We Use Traditional, Complementary, and Alternative Medicine Practices? The Role of Personality Traits and Thinking Dispositions*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
The use of traditional, complementary, and alternative medicine (TCAM) practices is growing worldwide. To understand the reasons behind this trend, we explored basic psychological variables such as personality traits and thinking dispositions as predictors of TCAM use. A sample representative of the Serbian adult population ($N$ = 1003; 57.6% female; age range: 18-75) completed: 1) TCAM-22, a comprehensive checklist for indicating lifelong use of 22 TCAM practices such as acupuncture, use of herbal products, meditation/mindfulness, and prayer for own health, 2) HEXACO personality inventory, 3) DELTA inventory assessing the additional personality trait of Disintegration - a tendency towards psychotic-like experiences, 4) REI-8 assessing rational and experiential thinking styles, and 5) the Cognitive Reflection Test. An average participant used eight TCAM practices during their lifetime ($M$ = 7.92), but there was also a considerable level of variability in TCAM use ($SD$ = 3.30). Personality traits and thinking dispositions were significant predictors of TCAM use, $F(10, 992) = 10.70$, $p < .001$, explaining 9.7% of its variance. More use of TCAM was best predicted by high experientiality (β = .16) and high Openness (β = .14), followed by high Emotionality (β = .12) and Disintegration (β = .11), with low Honesty-Humility (β = -.09) and low cognitive reflection (β = -.06) also contributing to the prediction. Our results suggest that thinking styles and personality traits may play a significant role in the choice of medical treatment and should thus be taken into consideration when planning healthcare strategies.

Keywords: Traditional, Complementary, and Alternative Medicine (TCAM) Use, Personality Traits, Thinking Dispositions

## Introduction

The use of traditional, complementary, and alternative medicine (TCAM) practices is experiencing a global surge (Harris et al., 2012; Kemppainen et al., 2017). However, TCAM is not without its risks including the potential for adverse effects or interactions when TCAM is combined with conventional medications and steering individuals away from proven conventional treatments (Patel et al., 2017). Recognizing these risks, the World Health Organization (WHO) underscores the necessity for a prudent approach to TCAM usage. This entails considering the evidence base for TCAM practices and carefully weighing their benefits against potential risks (WHO, 2019).

TCAM use is driven by a multitude of factors including deeply ingrained cultural beliefs, dissatisfaction with conventional medical treatments, the exponential growth of online information accessibility, and the perceived effectiveness in managing chronic conditions (Frass et al., 2012; Posadzki et al., 2013). However, despite belonging to the same culture or patient group, individuals exhibit varying levels of readiness in embracing TCAM practices resulting in significant intersubject variability in their use (Lazarević et al., 2021; 2023; Purić et al., 2022; Teovanović et al., 2021). It may be that some broader factors of individual differences are also relevant to the decision to use TCAM. Among these factors, personality traits and cognitive dispositions have emerged as particularly intriguing areas of investigation, offering insight into the psychological mechanisms underlying the inclination towards TCAM practices. Therefore, our research aimed to explore the predictive role of these basic psychological variables in TCAM use.

### *Personality Traits and TCAM Use*

Several theoretical frameworks, including the Big Five model (Goldberg, 1993) and HEXACO (Lee et al., 2004), supplemented by Disintegration - a recent conceptualization of proneness to psychotic-like experiences as a fundamental personality trait (Knežević et al., 2017) - have been employed to explore the interplay between personality traits and TCAM use.

One of the most consistent findings in the literature underscores a positive correlation between Openness to experience and TCAM adoption (refer to Galbraith et al., 2018 for a recent review). Individuals exhibiting high levels of Openness tend to possess curiosity, imagination, and a willingness to embrace novel ideas and experiences. Given that TCAM often encompasses unconventional and holistic approaches to health, those with elevated levels of Openness are more likely to explore alternative healing modalities.

Furthermore, studies investigating the relationship between Honesty-Humility and TCAM use remain relatively scarce but promising. Initial evidence suggests that individuals scoring high in Honesty-Humility may exhibit a reduced propensity to engage in TCAM practices lacking empirical support or scientific validation (Ashton & Lee, 2009; Lazarević et al., 2023). Preliminary findings also suggest that Disintegration can offer insights into the dispositional roots of TCAM use (Hergovich & Arendasy, 2007; Lazarevic et al., 2021), and the same holds for Agreeableness **(**Sirois & Purc-Stephenson, 2008; Smith et al., 2008). Conversely, research findings on the relationship between Extraversion and TCAM use are rather inconsistent indicating both positive (Smith et al., 2008) and negative (Ackerman & Chopik, 2020) correlations.

### *Thinking Dispositions and TCAM Use*

Understanding individuals' cognitive processing styles and how they relate to healthcare decisions, including the use of TCAM, is an area of increasing interest among researchers. The cognitive-experiential self-theory recognizes relatively stable individual differences in two distinct thinking style dimensions. The first, experiential system is automatic, effortless, rapid, and associated with affect, while the second, rational system is marked by conscious, analytical, effortful processing that is slower and devoid of emotional influence (Epstein, 1998). Thinking styles are typically measured as self-assessed ability and engagement in rational and experiential thinking, which are assumed to be independent dimensions rather than opposites on the same continuum. On the other hand, cognitive reflection ability is defined as the capacity or inclination to resist reporting the intuitive response (Frederick, 2005). It also contrasts rational and intuitive thinking, but typically assesses them as performance on questions that have both an intuitive, yet incorrect answer, and a correct answer that requires more deliberation.

Studies investigating the relationship between analytic thinking and TCAM use suggested that individuals more prone to analytic thinking may harbor greater skepticism toward TCAM practices (Bishop & Lewith, 2010; Saher & Lindeman, 2005; Wheeler & Hyland, 2008). Similarly, cognitive reflection ability is inversely correlated with TCAM use (Pennycook et al., 2020; Teovanović et al., 2020). Conversely, an intuitive (experiential) thinking style has been linked with a more receptive attitude toward TCAM use (Bishop & Lewith, 2010; Teovanović et al., 2020).

### *Current Study*

Personality traits and thinking dispositions have previously been shown to be related to TCAM use. Yet, more studies are needed to evaluate their combined effects and compare the strength of individual associations within a comprehensive model. Therefore, this study sought to establish the predictive power of personality traits and thinking dispositions for TCAM use, and also isolate the best predictors of this behavior.

## Method

This research was part of a larger preregistered study (for more details, see Knežević et al., 2023). The Ethical Committees of the Faculty of Philosophy in Belgrade (#935/1), Faculty of Special Education and Rehabilitation (#139/1), and Faculty of Media and Communications (#228) approved the protocol. All participants provided informed consent and willingly engaged in the study, with all procedures conducted following relevant guidelines/regulations and upholding the principles of the Declaration of Helsinki.

### *Sample*

The study was run on a Serbian national sample during May and June 2023. Data collection was managed through a professional research agency. The recruited sample ($N$ = 1231) was probabilistically selected at the household level, aiming for representativeness of the Serbian general population aged between 18 and 75 years. Following data collection, we first excluded 187 participants who failed either of three embedded attention check items and then a further 41 participants who produced low-quality data. Consequently, the final sample, which formed the basis of all analyses, consisted of 1003 participants. Their average age was

48.41 years (*SD* = 17.02), with females comprising 50% of the sample and 59.3% living in urban areas (vs. 40.7% in rural). On average, participants had 11.96 years of formal education, were of middle socioeconomic status (*M* = 3.33 on a 1-6 scale, *SD* = 0.91), tended to align with mildly right-leaning political views (*M* = 4.41 on a 1-7 scale, *SD* = 1.79) and displayed a moderate level of religiousness (*M* = 3.29 on a 1-5 scale, *SD* = 1.34). They perceived their health as mostly good (*M* = 3.76 on a 1-5 scale, *SD* = 0.91).

### *Instruments and Measures*

*TCAM use* was assessed via TCAM-22 (Purić et al., 2022), a comprehensive checklist for indicating lifelong use of 22 TCAM practices across four domains: alternative medical systems (comprising six items), natural product-based practices (six items), New Age practices (five items), and rituals/customs (five items). Participants indicated their use of each practice in a binary format (0 - indicating never having used the practice, 1 - indicating past or current usage). Total scores were derived by summing affirmative responses across relevant items, providing a measure of the count of lifetime engagement with selected practices.

*Personality traits.* The six fundamental personality traits: Honesty-Humility, Emotionality, eXtraversion, Agreeableness, Conscientiousness, and Openness - postulated by the HEXACO model -were assessed utilizing the HEXACO-60 inventory (Ashton & Lee, 2009). The additional broad trait of Disintegration was measured using the 20-item version of the DELTA9 scale (Knežević et al., 2017). Participants self-assessed each personality statement on a five-point Likert-type scale, ranging from 1 (*completely disagree*) to 5 (*completely agree*). The total score for each trait was derived by calculating the mean rating across the corresponding items.

*Thinking styles* were evaluated using an abbreviated 8-item version (Jokić et al, 2023) of the Rational-Experiential Inventory-40 (Pacini & Epstein, 1999). This scale consists of two subscales: rational (e.g., “I have a logical mind”) and experiential (e.g., “I like to rely on my intuitive impressions”), each containing four items. Participants expressed their agreement with these statements on a scale ranging from 1 (*definitely not true of myself*) to 5 (*definitely true of myself*). The mean rating across the corresponding items was used as a measure of a given thinking style.

*Cognitive reflection ability* was assessed using the short Cognitive Reflection Test (Frederick, 2005), consisting of three items that cue an intuitive but incorrect response. The total score was computed based on the number of correct responses.

## Results

As indicated by the results presented in Table 1, an average participant used 34.1% of the 22 examined TCAM practices during their lifetime. Looking at the domains of TCAM use, Natural product-based practices were by far the most commonly used with a typical participant reporting having used 84.8% of these practices, followed by Rituals/customs (33.6%). In contrast, participants had overall less experience in using Alternative medical systems (15.4%) and New Age (11.0%) practices.

**Table 1.** Descriptives for all variables

| Variable | Items | Range | M | SD | Reliability |
|---|---|---|---|---|---|
| TCAM-22 | 22 | 0-22 | 7.51 | 3.27 | .77 |
| Alternative medical systems | 6 | 1-6 | 0.93 | 1.23 | .60 |
| New Age practices | 6 | 1-6 | 0.66 | 1.25 | .70 |
| Natural product-based practices | 5 | 1-5 | 4.24 | 1.24 | .70 |
| Rituals/customs | 5 | 1-5 | 1.68 | 1.34 | .64 |
| Honesty-Humility | 10 | 1-5 | 3.61 | 0.66 | .74 |
| Emotionality | 10 | 1-5 | 3.18 | 0.65 | .71 |
| eXtraversion | 10 | 1-5 | 3.23 | 0.63 | .76 |
| Agreeableness | 10 | 1-5 | 3.18 | 0.60 | .69 |
| Conscientiousness | 10 | 1-5 | 3.59 | 0.62 | .74 |
| Openness | 10 | 1-5 | 3.18 | 0.82 | .78 |
| Disintegration | 20 | 1-4.6 | 2.40 | 0.71 | .89 |
| Rational thinking style | 4 | 1-5 | 3.54 | 0.97 | .80 |
| Experiential thinking style | 4 | 1-5 | 3.50 | 0.80 | .72 |
| Cognitive reflection | 3 | 0-3 | 1.08 | 1.12 | .67 |

Except for Disintegration, which was present in the sample to a moderately low degree, the means for all personality traits were above the scale midpoint while the ranges encompassed the entire spectrum of possible values. The same was true for both rational and experiential thinking styles, while out of three cognitive reflection items, participants on average got only one right.

Following the principal aim of the study, we investigated whether individual differences in TCAM use could be explained by personality traits and thinking dispositions, and if yes, to what extent. We conducted five separate multiple regression analyses, using overall TCAM use, as well as use within the four TCAM domains as criterion variables, and personality traits and thinking dispositions as predictors.

Results revealed that personality traits and thinking dispositions were significant predictors of overall TCAM use, $F(10, 992) = 10.70$, $p < .001$, explaining 9.7% of its variance (Table 2). Greater use of TCAM was primarily associated with high Experiential thinking ($\beta = .16$) and high Openness ($\beta = .14$), followed by high Emotionality ($\beta = .12$) and Disintegration ($\beta = .11$), with low Honesty-Humility ($\beta = -.09$) also contributing to the prediction.

**Table 2.** Multiple linear regressions with overall TCAM use and its four dimensions as dependent variables

| | TCAM use (overall) | | Alternative medical systems | | New age medicine | | Natural based practices | | Rituals/ Customs | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *r* | β | *r* | β | *r* | β | *r* | β | *r* | β |
| Honesty-Humility | -.06 | -.09$^{**}$ | -.06 | -.08$^{*}$ | -.08$^{*}$ | -.10$^{**}$ | .02 | -.05 | -.02 | -.01 |
| Emotionality | .13$^{**}$ | .12$^{***}$ | -.05 | -.04 | .06 | .04 | .13$^{***}$ | .12$^{**}$ | .21$^{***}$ | .19$^{***}$ |
| eXtraversion | .00 | .01 | .08$^{*}$ | .05 | -.02 | -.03 | -.05 | -.07$^{*}$ | -.02 | .05 |
| Agreeableness | .00 | .04 | -.01 | .00 | -.04 | -.02 | .06 | .07$^{*}$ | -.01 | .04 |
| Conscientiousness | .05 | .05 | .03 | .01 | .01 | .02 | .10$^{**}$ | .08$^{*}$ | -.02 | .03 |
| Openness | .18$^{**}$ | .14$^{***}$ | .15$^{***}$ | .11$^{**}$ | .22$^{***}$ | .21$^{***}$ | .12$^{***}$ | .09$^{**}$ | -.02 | -.04 |
| Disintegration | .11$^{**}$ | .11$^{**}$ | .02 | .04 | .11$^{**}$ | .08$^{*}$ | .00 | .00 | .16$^{***}$ | .16$^{***}$ |
| Rational thinking | .06 | .01 | .09$^{**}$ | .02 | .06$^{*}$ | -.01 | .07$^{*}$ | .04 | -.05 | -.02 |
| Experiential think. | .19$^{**}$ | .16$^{***}$ | .16$^{***}$ | .13$^{***}$ | .18$^{***}$ | .14$^{***}$ | .05 | .02 | .11$^{**}$ | .12$^{***}$ |
| Cognitive reflect. | -.07$^{*}$ | -.06 | .01 | -.01 | -.05 | -.06 | -.03 | -.05 | -.10$^{**}$ | -.05 |
| F (10, 992) | 10.70$^{***}$ | | 5.34$^{***}$ | | 10.19$^{***}$ | | 4.94$^{***}$ | | 8.89 | |
| $R^2$ | 9.7% | | 5.1% | | 9.3% | | 4.7% | | 8.2% | |

*Note*. $^{***}p$ <.001, $^{**}p$ <.01, $^{*}p$ <.05

When considering specific domains of TCAM use, basic psychological variables were more predictive for New Age medicine use ($R^2$ = 9.3%) and Rituals/customs ($R^2$ = 8.2%) compared to the use of Alternative medical systems ($R^2$ = 5.1%) and Natural product-based practices ($R^2$ = 4.7%). Also, our analyses revealed a slightly different pattern of correlations. For instance, the combination of high Openness (β = .21) and Experiential thinking (β = .14) alongside low Honesty-Humility (β = -.10) explained individual differences in the use of New Age medicine. Conversely, the use of rituals and customs for healing purposes was better understood as a combination of heightened Emotionality (β = .19), Disintegration (β = .16), and Experientiality (β = .12).

Our results align well with the findings of previous studies. Namely, we replicated the conclusion that, out of all personality traits, Openness was the most relevant for the decision to use TCAM (Galbraith et al., 2018). It was both the strongest and the most consistent of TCAM use, both overall and across domains. The only exception was the use of Rituals/customs which comprise traditional and religious practices, which may reflect conservative worldviews. Also in line with previous studies, we found that Disintegration, Honesty-Humility, and eXtraversion are all relevant personality traits when considering TCAM use.

However, it is important to note that the experiential thinking style was equally important in predicting TCAM use as personality traits, and was relevant in predicting all TCAM domains, except for natural product-based practices. Since these practices were the most prevalent in the sample, it is possible that a restriction of range led to a lower correlation with this domain compared to others.

## Conclusions

Our results suggest that thinking styles and personality traits may play a significant role in the choice of medical treatment, specifically the tendency to rely on TCAM, and should thus be taken into consideration when planning healthcare strategies. However, the relatively small percentage of explained variance indicates that other variables, such as previous experiences with official healthcare systems, (mis)trust in official medicine and its practitioners, but also irrational beliefs and cognitive biases, may be of even greater importance when it comes to TCAM use (Teovanović et al., 2024). Future studies should systematically explore the joint effects of a wider range of psychological variables on the use of TCAM. Additionally, investigating cultural variations in TCAM use and its relation with personality traits and thinking dispositions can provide valuable insights into the cross-cultural stability or instability of psychological underpinnings of TCAM use (see, e.g., Majima et al., 2022).

## Acknowledgements

This research was supported by the Science Fund of the Republic of Serbia, #GRANT 7739597, *Irrational mindset as a conceptual bridge from psychological dispositions to questionable health practices* – REASON4HEALTH.

We would like to express our gratitude to our colleagues from the REASON4HEALTH project who contributed to the study design and data collection.

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# *Effectiveness of EMDR – IGTP in Reducing Distress and Promoting Well-being Amongst Uniformed Reserves During the Enhanced Community Quarantine*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
The Philippine Society was appalled with the massive disruption and threat of Covid when it was announced to have local transmission on March 8, 2020. As a response of the government, uniformed personnel was deployed in order to help in various communities. This study investigates the effects of the EMDR Integrative Group Treatment Protocol (EMDR-IGTP) on Uniformed personnel and volunteer reservists who have experienced negative impacts during the Covid-19 pandemic. There are sixty-six (66) participants of Uniformed personnel and volunteer reserves attended the EMDR Integrative Group Treatment Protocol (EMDR-IGTP) during their volunteer service during the Enhanced Community Quarantine. Using an ex-post facto research design, the effectiveness of EMDG-IGTP was explored in Reducing Distress and Promoting Well-being Amongst Uniformed Reserves During the Enhanced Community Quarantine, results shows that there was a significant difference in the subjective unit of distress from the pre-IGTP and post-IGTP. SUD's were also decreased in the post-test, suggesting that IGTP played a huge role in lowering down the subjective unit of disturbances of the participants. One-way ANOVA test showed a significant difference in the subjective unit of disturbance of the four (4) axes. The results from the pre-test and post-test well-being assessment indicate that the IGTP resulted in significant difference, with the post-test showing a lower mean score as compared to the pre-test. Implications of the study results are also presented in this study.

Keywords: EMDR-IGTP, Uniformed Reservist Personnel, Reducing Distress & Well-being

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## Introduction

The Covid-19 pandemic brough the Philippines under a state of calamity in which many essential frontline workers continued their job. During this time, Enhanced Community Quarantine was imposed in Metro Manila and other parts of the country. The Armed Forces of the Philippines, dedicated to their duties, risking their own wellbeing to ensure the safety of Filipinos affected by the dreaded disease". The war cry of our great soldiers in the Philippine Army has always been "serving the people, securing the land." The typical battlefield outfitted with military gear, tanks and cannons evolved into face masks, thermometer guns, and personal protective equipment. Wearing their battle dress uniform, the Philippine Army engaged in a larger conflict with COVID19, an invisible foe. a military that is prepared to serve in humanitarian crises in addition to fighting conflicts (Agulto, 2020).

Frontline employees are under extreme pressure at work because of the COVID-19 pandemic, which is risking their physical, mental, and social health. Long-term exposure to severe stress can have a number of negative effects on frontline employees' emotional and mental health. It can result in unhealthy behaviors like using tobacco, alcohol, or other substances, which may lead to substance use disorders, the beginning of common mental disorders like melancholy and anxiety or post-traumatic stress disorder (PTSD), and an increase in the risk of suicide among frontline workers (WHO, 2020).

In a cross-sectional-mixed method study conducted by Zhang et. al., (2021), front-line healthcare personnel encountered exceptional stresses and mental discomfort that persisted for years after the crisis. 30% of the respondents displayed depressive symptoms. From their descriptions, four themes have emerged: (1) 64.4% of respondents highlighted their anxiety about spreading the disease to themselves or others; (2) serious concern about the lack of PPE due to both the actual shortage and the evolving infection control regulations; (3) voiced worries regarding fluid protocols and the need for systemic solutions to the pandemic to address problems such not following guidelines, testing, overtaxing the system, alterations to the system for non-COVID patients, etc.; and (4) expressed concern about long-term effects, including mental health, uncertainty, economic effects, etc.

In a study conducted by Faretta, et. al., (2022), the participants were the frontline healthcare workers of a nursing home in Italy. Using Impact of Event Scale-Revised (IES-R) to measure PTSD symptoms and eye-movement desensitization and reprocessing (EMDR) therapy technique as intervention, the scores for perceived post-traumatic stress disorder (PTSD) symptoms and quality of emotional experience improved significantly following participation in the therapy program. In a similar study conducted by Fogliato, et. al., (2022), Statistical analyses were carried out to highlight the differences in Impact of Event-Revised (IES-R) and Post-Traumatic Growth Inventory (PTGI) before and after the group intervention. Healthcare workers maintained positive changes over time despite their prolonged exposure to an emergency and the possibility of re-traumatization at the onset of a new emergency phase, irrespective of their working place.

This study investigates the effects of the EMDR Integrative Group Treatment Protocol (EMDR-IGTP) on Uniformed personnel and volunteer reservists who were on-duty during the ECQ. Using an ex-post facto research design, the researchers explore the effectiveness of EMDR-IGTP in Reducing Distress and Promoting Well-being and Change Management Amongst Uniformed Reserves During the ECQ, results shows that there was a significant difference for pre-IGTP and post-IGTP for SUDs, with post-test SUD receiving low scores,

suggesting that IGTP played a huge role in lowering down the subjective unit of disturbances of the participants.

## Well-being of the Uniformed Personnel During the ECQ

In comparison to the general population, there is a higher risk of infection in policing, which is commonly acknowledged as a high-risk profession. Since the beginning of the pandemic, the function of uniformed personnel has changed from just preventing crime in our communities to also playing a crucial part in containing the virus's spread, upholding the law, and encouraging safer neighborhoods. Police officers are faced with the tough responsibility of maintaining community safety and stopping the spread of COVID-19 while putting their physical and mental health at risk. This makes their job during the coronavirus (COVID-19) pandemic difficult (Edwards, A. M., & Kotera, Y., 2021).

According to Mehdizadeh, S., and Kamkar, K., (2020), the COVID-19 pandemic has provided extra occupational stresses to police, such as public threats and assaults, as well as viral exposure, raising the chance of operational stress injuries (OSI). The danger of psychological work-related problems does increase for police officers. OSI are ongoing psychological issues brought on by operational or service-related responsibilities. Depression, anxiety disorders, trauma and stressor-related illnesses, particularly post-traumatic stress disorder (PTSD), and/or drug use disorders are a few frequent mental health issues. Risks can also include discomfort, physical injuries, physical health issues, such as cardiovascular disease, and a variety of psychosocial stressors (such as financial strains, relationship strains), all as part of operational or service-related duties.

Additionally, local officials need to be aware of the serious risk that COVID-19 infection poses to law enforcement personnel. Law enforcement and other first responders, such medical professionals, will probably come into contact with an infected person. Law enforcement personnel may encounter significant stress in addition to the risks of getting the COVID-19 virus during this period due to increased demands and ongoing duties outside of work as well as the possibility of family members being ill (Ors, Y., 2020).

## Volunteering in the Midst of the Pandemic

Volunteering seems to improve life satisfaction more in older (age 60 and above) individuals than in younger individuals. According to a survey conducted by the British Household Panel that was analyzed using a life course perspective, volunteering has a favorable effect that is more noticeable in midlife and later in life when freely chosen and not mandated (Tierney, S., and Mahtani, K.R., 2020). In another study conducted by Alhajjaj, H. A., and Al Nabulsi, H. H., (2022), volunteering during the COVID-19 pandemic has helped people during this time gain a variety of skills, which has been beneficial.

Since volunteers are particularly susceptible to health hazards in these situations, there is a great need to protect them. and the study's findings make clear that they have a poor view of society and place little value on their involvement in bringing about social change (Alhajjaj, H. A., & Al Nabulsi, H. H., 2022). Volunteering for social emergencies was associated with those having diagnosed physical condition (8% greater chances) or mental illness (16% higher odds). People with identified mental health disorders had a 23% greater chance of participating in formal volunteering, whereas those with physical sickness had a 27% lower chance of participating in neighborhood volunteering (Mak, H. W., & Fancourt, D., 2021).

Volunteering provides significant health and wellness advantages, in addition to playing an important role in helping individuals and communities (e.g. improved self-rated health, lower levels of sadness, greater wellbeing, self-esteem, and quality of life).

## Research Questions

This study was conducted during ECQ with the Uniformed Personnel in an attempt to improve the well-being of the participants using EMDR-IGTP. Specifically, it aims to answer the following research questions: 1) Is there a significant difference between the SUDs of the participants in pre-IGTP and post-IGTP? 2) Are there significant differences between the SUDs of the participants per axis? 3) Is there a significant difference between the pre-test and post-test of well-being scale? 4) What are the participants' perspectives about their future vision?

## Materials and Methods

### Research Design

This study used an Ex-post Facto and Quasi-experimental research design. An Ex-post Facto research design is used to determine the cause and effect relationship between an independent and dependent variable. This entails particular character or traits of participants that cannot be manipulated. A quasi-experimental research design is similar to experimental research in a sense that the independent variable is being manipulated with no control group, no random selection, no random assignment, or no active manipulation, and is different from experimental research (White and Sabarnal, 2014). Comparative analysis of the pretest and the post-test well-being scores and SUD’s of the participants were also conducted.

### Sample

The participants of the study were composed of 66 uniformed personnel and volunteer reserves with the age range of 21 to 40 years old, who rendered their duty during the Enhanced Community Quarantine (ECQ) in the succeeding months: March 17, 2020 to August 18, 2020, regardless of the gender.

### Research Instruments

In order to measure the distress and well-being and impacts of EMDR-IGTP, the following instruments were used during the study.

**Warwick-Edinburgh Mental Well-being Scale (WEMWBS).** This study used The 14-item Warwick-Edinburgh Mental Well-being Scale (WEMWBS) that offers a comprehensive picture of mental health with the well-balanced questions covering subjective well-being and psychological functioning. It is preferred in situations where it is valuable to give study participants a picture of their mental wellbeing. to measure the participants’ mental well-being. Five response categories make up the 14-item WEMWBS scale, and their aggregate yields a single score. The concept is made more approachable by the items' positive wording and coverage of both feeling and functioning aspects of mental wellbeing. The scale has been widely utilized worldwide for project and program evaluation, monitoring, and research into the factors that influence mental health (Tenant, R., et. al., 2007).

## Treatment

**EMDR-IGTP.** The therapy technique that was used in this study is EMDR-IGTP, which was originally developed for children who are having a hard time expressing their traumatic experiences, and was later updated for adults (Jarero, I., Artigas, L., Alcala, N., Cano, T.L, 2015). Originally, it has a total of 7 phases, but this study utilized 5 phases: (1) Client history, where all the information concerning the traumatic experience is gathered; (2) Preparation, ensuring that the ratio is 1 therapist is to 10 participants, establishing rapport, and normalizing the experience so the participants will know that everyone in the room were in the same boat, and then the techniques like the safe place, the butterfly hug, and the tapping paces were introduced; (3) Assessment, where the therapists have to check the emotions of the participants in the group, and starting to draw on the Axis A; (4) Desensitization, where the butterfly hug is being performed while recalling the traumatic experience drawn in Axis A, followed by the instruction that all the changes that the participants noticed after doing the butterfly hug will be drawn in Axis B, repeating the process of doing the butterfly hug and drawing the changes in Axis C, and then doing the process for Axis D; (5) Future Vision, where after re-installing the safe place and checking the SUD, the participants were asked how they see themselves in the future. The rationale for changing the individual EMDR procedure was to provide mental health services in the aftermath of a disaster and to meet the demands of the mental health population. The procedure was initially intended for use with children, and then later tailored for adults (Jarero, I., Artigas, L., Alcala, N., Cano, T.L, 2015).

## Procedure

Recruitment of participants were held in two stages and occurred between June 10, 2020 to June 25, 2020 in the National Capital Region. In the first stage, a trained facilitator explained the purpose of the research to the interested uniformed personnel and volunteer reservists, as well as inclusion and exclusion criteria. In the second stage, the same assessor obtained informed consent and administered the WEMWBS (pre-intervention measurements).

From June 10, 2020 to June 25, 2022; the WEMWBS was administered on different occasions for the pre-treatment assessment followed by the EMDR Integrative Group Treatment Protocol. Between September 2, 2020 and October 9, 2020, the administration of WEMWBS post-treatment assessment was conducted. There was no follow-up assessment given, considering the limitations of the duty schedules by the uniformed personnel and volunteer reservists due to slow lifting of quarantine restrictions.

## Data Analysis

T-test independent statistical analysis was applied to compare the difference between the pre-test and post-test of Warwick-Edinburgh Mental Well-being Scale (WEMWBS), and the pre-and-post IGTP-EMDR intervention. T tests are typically employed when the experimental participants are split into two distinct groups, each receiving a different treatment (A or B). Pre-treatment and post-treatment outcomes are two different sorts of results that researchers can gather before and after the therapy (Kim, T. K., 2015). One-way ANOVA was used to determine the differences of the participants' Subjective Units of Disturbances (SUD) for each individual axis of the IGTP-EMDR treatment. In the need to determine the differences with more than 3 groups, ANOVA is the best parametric statistical treatment to use (Kim, T. K., 2017).

## Ethical Considerations

All participants were provided with an information sheet that detailed the background and the aims of the study as well as the requirements of taking part. The Office of the Uniformed Reserves Unit approved of the conduct of the study. Respondents gave written informed consent to take part in the evaluation, and all processes undertaken in the evaluation were carried out in accordance with the APA Code of Ethics for Psychological Research.

## Results and Findings

This part of the study discusses the interpretation, descriptions, and the significance of the result findings in light of knowing whether there is a significant difference between the data in comparison, and to explain new understanding and insights when taking the findings into consideration.

Table 1. *Demographic Profile*

| Age range | ***f*** | **%** |
|---|---|---|
| 20-29 | 35 | 54 |
| 30-39 | 16 | 24 |
| 40 and above | 14 | 21 |

Table 1 shows the age range of the participants. 54% of the uniformed personnel's age fell in the range of 20-29 years old ($f$ = 35, n = 65), followed by 24% ages 30-39 years old ($f$ = 16, n = 65), and 21% for ages 40 and above ($f$ = 14, n = 65).

Table 2. *t-test for pre-IGTP and post-IGTP Subjective Units of Disturbances*

| | **Mean** | **Pearson Correlation** | ***df*** | ***t* stat** |
|---|---|---|---|---|
| Pre-IGTP | 5.92 | 0.43 | 65 | 10.81 |
| Post-IGTP | 1.95 | | | |

In table 2, a t-test analysis was to determine the difference between the pre-IGTP and the post-IGTP SUD. Table 2 shows that there was a significant difference for pre-IGTP and post-IGTP for SUDs, $t(65) = 10.81$, $p < .00001$, with post-test SUD receiving low scores, suggesting that IGTP played a huge role in lowering down the subjective unit of disturbances of the participants.

Figure 1. Scatterplot of Subjective Units of Disturbances (SUD) per axis

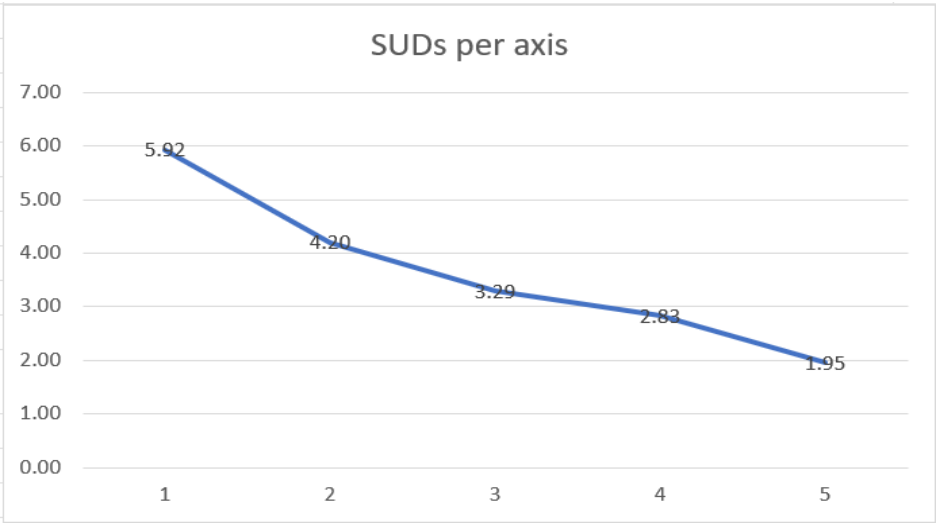



Figure 1 shows the scatter plot of the Subjective Units of Disturbances (SUD) per axis. Axis A ($\bar{x}$ = 5.92), Axis B = ($\bar{x}$ = 4.20), Axis C ($\bar{x}$ = 3.29), Axis D ($\bar{x}$ = 2.83), and the last SUD ($\bar{x}$ = 1.95). The trend line shows that the SUDs are significantly decreasing per axis. The psychometric properties of SUD is highly reliable in terms of global measures of both physical and emotional discomfort during traumatic events (Kim, Bae, & Chon Park, 2008).

Table 3. *One-way ANOVA (between groups) SUD per axis*

| ***df*** | ***F*** | ***F*-crit** | ***p*** |
|---|---|---|---|
| 4 | 16.03064364 | 2.399432062 | 0.0001 |

Table 3 shows the result of one-way ANOVA having a significant difference in the subjective unit of disturbance of the four (4) axes, F(4, 325) = 16.03, p < .0001.

Table 4. *Mental Well-being Scale Result*

| | **mean** | ***df*** | ***t* stat** | ***t*-crit** | ***p*** |
|---|---|---|---|---|---|
| **pre-treatment** | 4.47 | 57 | 1.95 | 1.67 | 0.02 |
| **post-treatment** | 4.31 | | | | |

The results from the pre-test (M = 4.47, SD = 0.38) and post-test (M = 4.31, SD = 0.40) well-being assessment indicate a significant difference between their scores, t(57) = 1.95, p = .02. The post-test showing a lower mean score as compared to the pre-test.

## Discussion

The results of the study appear to indicate that EMDR-IGTP, offered to uniformed reservist who experienced subjective unit of disturbances due to ECQ appears to be effective. Furthermore, this treatment, after comparing the pre-test and post-test subjective unit of disturbance scores specifically lowers the distress levels of the participants. However, the

mental well-being of the participants were not affected due to several reasons. One, the EMDR session needs to be administered in more than one session to impact the mental well-being of the participants. Secondly, the researchers purported that considering the time when this study was conducted, the effect on the economy and the isolation caused by the Enhanced Community Quarantine played a significant role in lowering down the well-being scores of the participants. According to Barbisch et al. (2015), boredom, being alone and separated from loved ones can have a negative impact on a person's wellbeing. Significant resentment, anxiety, and even an increase in suicide rates have been documented after the implementation of restrictions due to Covid-19 outbreak (Brooks et. al., 2020).

## Limitations

This was a small study with participants who were volunteer Uniformed reservists. There was no control group or comparator group and no follow-up was conducted after the study.

## Conclusions

There is a substantial amount of research indicating the lowering of the subjective units of distress of participants with adverse life events after undergoing EMDR-IGTP. This shows that processing memories or distress of such experiences can relieve negative emotions, beliefs and physical sensations. Potential applications of EMDR-IGTP to stress related problems and as well those individuals suffering from other conditions. Front liners like Uniformed Reservist can benefit from this intervention. EMDR-IGTP can contribute in determining the degree to which distressing experiences add up and address the problem through memory processing that can help resolve psychological distress.

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# *A Comparative Study of the Sensitivity of Evaluation Tools for Pragmatic Deficits in Individuals With ADHD*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
Adults with Attention Deficit Hyperactivity Disorder (ADHD) face various specific challenges, including difficulties with figurative comprehension. Among the most prevalent issues are significant pragmatic and social difficulties, which usually lead to functional impairments. ADHD is one of the most frequently diagnosed disorders in children, yet in many cases the diagnosis is not made until adulthood due to numerous factors, such as an educational background, under-resourced familial environments, high intelligence masking stress-related difficulties and additional comorbidities. Consequently, these individuals miss out on early treatment, leading to significant social and pragmatic challenges that affect their lifestyle, education and occupational functioning. This study presents a comparative analysis of the pragmatic difficulties, faced by adults with varying severities of ADHD symptoms and it evaluates the validity of incorporating a pragmatic domain into diagnostic tools to identify ADHD-related pragmatic deficits for developing more effective intervention programs focused on enhancing individuals' social and pragmatic skills.

Keywords: ADHD, Pragmatic Deficits, Assessment Tool, Intervention Programs

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## Introduction

Attention deficit/hyperactivity disorder (ADHD) is frequently identified as one of the predominant neurodevelopmental disorders in children (Wolraich et al., 2019). However, a significant number of ADHD diagnoses occurs in adulthood, attributable to several factors: a). the structure of their environments and the minimal demands (Adler et al., 2015); and b). various obstacles, such as compensatory mechanisms linked to high intelligence or socioeconomic constraints (Fleischmann & Fleischmann, 2012). Notably, the diagnostic process for females tends to be delayed due to the predominance of internalized symptoms and the prolonged development of coping mechanisms that mask the core symptoms of ADHD (Katzman et al., 2017). Importantly, the individuals undiagnosed in childhood are more likely to encounter substantial challenges in marital relationships, parenting, financial management, occupational functioning, academic achievements and healthy lifestyle (Barkley et al., 2008; Ernst et al., 2003; Fleichmann & Miller, 2013). As a result, these challenges often precipitate stress, feelings of guilt and diminished self-confidence (Fleischmann & Fleischmann, 2012). For instance, college students with ADHD have been shown to achieve lower grade point averages and exhibit a lower graduation rate compared to their non-ADHD peers (DuPaul et al., 2009; Katzman et al., 2017). Thus, the lack of timely diagnosis and subsequent early intervention may result in persistent and severe pragmatic, social and functional difficulties.

Nowadays, despite the existence of several tests that provide a discourse and conversation assessment, such as the Pragmatic Protocol (Prutting and Kirchner, 1987), the Profile of Communicative Appropriateness (Penn 1985); and the ADHD symptom rating scales, like Adult ADHD Clinical Diagnostic Scale version 1.2 (Brown, 1996), Adult ADHD Self-Report Scale (ASRS) v1.1 (Adler et al., 2006; Kessler et al., 2005), Swanson, Nolan and Pelham IV Questionnaire (SNAP-IV) (Swanson et al., 1981; Swanson, 1992) and Conners' Rating Scale-IV (Conners, 1997, 2008; Conners et al., 2012), the pragmatic assessment tool most often is not included in the clinical practice. However, pragmatic language skills are crucial for facilitating daily social interactions and establishing bonds, as well as for conveying intentions relevant to the context. Indeed, according to the American Speech-Language-Hearing Association (ASHA), pragmatics encompasses a comprehensive array of the communicative domains, both linguistic and non-linguistic.

Despite the importance of the diagnosing the pragmatic skills, in general, and in ADHD population, in particular, there is a long debate concerning the diagnostic procedure of the linguistically based communicative pragmatic disorder in a most appropriate and efficient way. The pragmatic assessment in ADHD population is particularly important since adults with ADHD experience various specific difficulties with figurative comprehension, like reaching the intended meaning of metaphors and non-literal language in general (Segal et al., 2015). Moreover, significant pragmatic and social difficulties, which usually lead to functional problems, are among the most common difficulties experienced by individuals with ADHD (Cordier et al., 2010; Cordier et al., 2017; Green et al., 2014). But the pragmatic language skills are difficult to measure since the social use of language – the dimension of pragmatics – substantially depends on situational context, cultural norms and speakers themselves (Young et al., 2005; Adams et al., 2002). Furthermore, the pragmatic language skills assessment is considered to be rather complex as far as communicative deviations at the pragmatic level are assigned to cognitive or social deficits and the available pragmatic tests are too long to include them into clinical setting (Arcara & Bambini, 2016).

The aim of the current research is to evaluate the validity of the inclusion of the pragmatic domain into the diagnostic tool for the identification of ADHD by comparing different diagnostic tools for ADHD symptoms in the clinical settings. This comparative study provides a systematic and a standardized evaluation of the pragmatic difficulties in the individuals who were divided into three groups according to the various degrees of ADHD symptoms severity. That is, the goal of the current study is to evaluate the sensitivity of the novel method for the assessment of the pragmatic skills, that is, APACS-Heb tool, in the assessment of the pragmatic deficits in the population with different degrees of severity of ADHD symptoms, thus, expanding the inventory of tools for assessing the pragmatic abilities in the Hebrew-speaking clinical population diagnosed with ADHD. APACS-Heb version is based on an original translation from Italian by Mashal (2017, version 2.1), subsequently revised and modified by Even-Simkin in a collaborative effort with Mashal in 2019. Assessment of Pragmatic Abilities and Cognitive Substrates (APACS), which originally was developed for Neuro-Typical population in Italian by Arcara and Bambini (2016) was also found to be a reliable measure for assessing pragmatic abilities in neuro-typical Hebrew-speaking individuals. That is, the normative data collected for the APACS-Heb battery validated and showed a high reliability of this tool in providing a comprehensive measure of pragmatic skills in adolescents and young adults (Fussman & Mashal, 2022). The preliminary results of the pragmatic profile of ADHD revealed an attenuated functioning in inference of a non-literal meaning and a non-complete development of figurative language comprehension in adults with ADHD (Even-Simkin & Mashal, manuscript submitted for publication). The findings that were supported by the results obtained in the further study of the psychometric properties of the systematic and standardized evaluation tool of the pragmatic abilities in adults with ADHD, based on a comprehensive approach introduced by Arcara and Bambini (2016) for the assessment of pragmatic abilities in neuro-typical individuals (Even-Simkin, in press).

## Methods and Results

This study presents a comparative analysis of the sensitivity of the APACS-Heb assessment tool for the evaluation of the pragmatic deficits in ADHD population by comparing three groups of participants whose ADHD Sensitivity Rate was evaluated following the different assessment methods. The first group included 47 participants, females and males with a mean age of 24.51 years who were clinically diagnosed with ADHD following the DSM-V (APA, 2013) diagnostic criteria. The second group included 41 participants, females and males with a mean age of 24.15 years who were without a history of any neurodevelopmental or psychiatric disorders, but who were classified with severe ADHD symptoms following the Hebrew version of the WHO adult ADHD self-report eighteen screen scale (Zohar & Konfortes, 2010). The third group included 31 participants, females and males with a mean age of 24.35 years, who were clinically diagnosed with ADHD following the DSMV diagnostic criteria and were identified with severe ADHD symptoms following the WHO adult ADHD self-report eighteen screen scale. Control groups were matched to the studied group following those parameters. All the participants were native speakers of Hebrew language with IQ $\geq$ 80 with a mean age of 24.15-24.51 years. The research was provided after it has been approved by the Institutional Research Ethics Committee and the individuals' written consent was obtained prior to their participation in the study.

To provide a detailed comparison of the pragmatic deficits among adults with different severity of ADHD, the APACS-Heb tool was exploited for the assessment of the pragmatic deficits in the ADHD population. The APACS-Heb tool had been chosen since it did not

involve a role play approach which was considered to be a controversial one in the clinical settings (Crockford & Lesser, 1994). Moreover, APACS is built up to focus on the verbal pragmatic abilities in social communication and on the use of functional communication scale which is the most efficient measure of communicative skills in social situations (Acara & Bambini 2016). This APACS test includes two pragmatic domains, that is, discourse and literal language, which assess the PRODUCTION and COMPREHENSION in 6 tasks: interview; description; narratives; figurative language 1 (familiar idioms, novel metaphors and common proverbs presented in a minimal context); humor; and figurative language 2 (verbal explanation of familiar idioms, novel metaphors and common proverbs) (Acara & Bambini, 2016). Moreover, a total duration of the assessment procedure is rather short, i.e., it is about 35-45 minutes and the assessment tool materials include an everyday language and photographs instead of drawings to shape pragmatic skills used in the daily communication (Acara & Bambini, 2016). In addition, an easy administration and scoring system do not require an effortful training of clinicians. Beside the DSMV diagnostic tool, the complete scale for scoring the full range of the response categories in the Hebrew version of the Adult ADHD self-report eighteen screen scale has been adopted to assess the severity of the ADHD symptoms, since it has been found to be the most appropriate for the clinical practice (Zohar & Konfortes, 2010).

The comparative analysis of the sensitivity rates for detecting pragmatic deficits among adults with varying severity of ADHD symptoms, utilizing different assessment methods and their combinations, demonstrated varied sensitivity across the participants in three groups differentiated by their symptom severity. Figure 1 illustrates the percentages of individuals with ADHD who scored below the 5$^{th}$ percentile to their matched control group across various tasks. The findings indicate that the highest sensitivity rate in the third group was observed in the total APACS score at 19.4%, followed by a notably lower sensitivity of 16.1% in Pragmatic Comprehension. In contrast, the second group exhibited the greatest sensitivity in the Pragmatic Comprehension Task, specifically in Narratives, at 17%. Sensitivity was substantially lower in the first group, where the highest rate was found in the Pragmatic Production Task, specifically in Description, and in a composite score of Pragmatic Production and Total APACS at 15%.

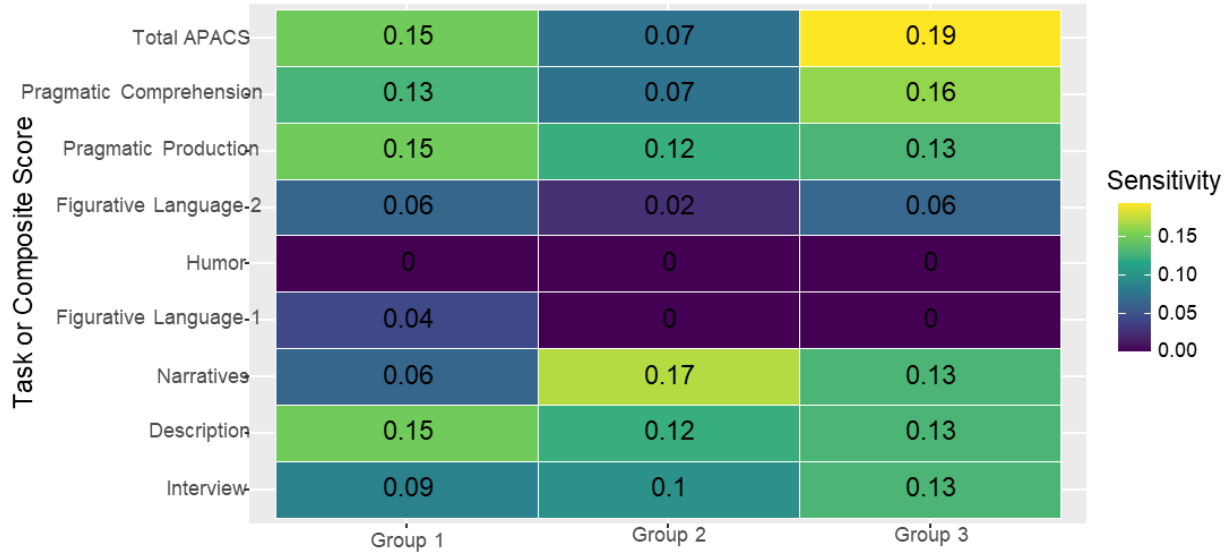



Figure 1: Cut-offs for ADHD sensitivity for APACS-Heb Scores.

Consequently, the highest sensitivity for pragmatic deficits in adults with ADHD was found in the individuals who were clinically diagnosed with ADHD following the DSMV diagnostic criteria and were identified with severe ADHD symptoms following the WHO adult ADHD self-report scale.

Furthermore, it is essential to highlight the significant findings obtained at the group level, which reveal the distinct characteristics of the pragmatic deficits across the groups. That is, individuals in the first group exhibited significant deficits in the pragmatic comprehension task, particularly in understanding figurative language (Figurative Language 2). In the second group, participants displayed the significant deficit in the pragmatic comprehension task, notably in Narratives. Conversely, those in the third group demonstrated the significant deficit not only in Figurative Language 2 and Narratives but also in the APACS total score. These variations emphasize the differential impact of ADHD severity on the pragmatic language processing among the groups.

The above-presented comparison of the pragmatic deficits among adults with varying severity rate of ADHD symptoms offers the preliminary results that underscore the significant utility of the Hebrew version of the APACS compact test kit. This study presents a marked efficiency of this tool in identifying specific impairments in pragmatic competence, which is essential for the effective communication. However, a further study is needed to gain a deeper insight into this area and to maintain the psychometric properties of this tool, particularly for its integration into clinical diagnostic settings.

## Conclusion

This study presents a comparative analysis of the sensitivity rates of the pragmatic deficits among adults with varying severity degrees of ADHD symptoms, utilizing the APACS-Heb version, the tool which is based on the comprehensive approach developed by Arcara and Bambini (2016). Additionally, this research offers an expanded perspective on the pragmatic disorders within the ADHD population.

The study highlights the psychometric properties of the APACS-Heb version and suggests its potential utility in incorporating pragmatic skills into the cognitive profiling within ADHD diagnostic practices. The obtained results point to the potential input of this tool in the diagnostic settings, since it can facilitate the identification of the pragmatic deficits across different severity levels of ADHD symptoms and it can also be potentially adopted for the targeted intervention programs focused on enhancing the pragmatic skills. Integrating this assessment tool into the clinical settings could advance the development of customized intervention programs, optimizing social communication, academic performance and employment outcomes for individuals with diverse levels of the pragmatic deficits.

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# *Prevalence of Prolonged Grief Disorder Adult Bereavement in East Asia: A Systematic Review and Meta-Analysis*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
Death is an inevitable and natural part of life, however, the emotional state of grief and pain after the passing of a family is devastating. While many recover over time, a minority experiences clinical dysfunction following a loss. Prolonged grief disorder (PGD) is a newly added diagnostic criterion in the DSM-5-TR to classify those who display pathological symptoms of grief for a prolonged period. The suggested pooled transcontinental prevalence rate of PGD is 9.8%. Eastern countries are suggested to have a lower prevalence rate compared to Western countries. This review aims to estimate the prevalence rate of PGD in the adult bereaved population of East Asia. A systematic literature search was conducted in PubMed, PsycINFO, and Web of Knowledge. Five eligible studies from China and Japan with 4004 bereaved individuals were identified. Meta-analysis revealed a pooled PGD prevalence of 8.90% (95% CI 0.2 - 17.6). The first systematic review and meta-analysis of the prevalence of PGD within the East Asian population suggests that nine out of one hundred bereaved adults in East Asia are at risk for PGD. Cultural differences in the East Asian bereaved cultural values and practices surrounding deaths might be responsible for the different prevalence. The few eligible studies only from two countries call for further investigation on PGD within the general bereaved population in other East Asian countries. However, the result should be interpreted cautiously due to the high degree of methodological heterogeneity as well as the lack of generalizability to other East Asian countries.

Keywords: Prolonged Grief Disorder, Bereaved Individuals, Prevalence, Meta-Analysis, East Asia, China, Japan

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## Introduction

It is common knowledge that death is a natural process of life, however, the emotional consequences of grief and pain following the death of a family member can be devastating. The experience of losing a loved one is often perceived negatively since we are permanently deprived of a positive aspect of life. A natural grieving process among most bereaved individuals is characterized by both the expression of negative emotions and the restoration of daily life functions, gradually adjusting to their new life circumstances (Jorand and Litz, 2014). Although a majority recover over time, a portion continues to display pathological symptoms of grief, such as severe and abnormally persistent grief that causes impairment in important domains of functioning, they can then be diagnosed with prolonged grief disorder (PGD) (American Psychiatric Association, 2022; Prigerson et al., 2009). PGD was recently added as a new diagnosis for the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR) (2022) and is also included in the 11th edition of the International Classification of Diseases (ICD-11) (World Health Organization, 2022). The core symptoms are intense longing for the deceased and preoccupation with the deceased or the cause of death, often accompanied by denial, avoidance of the death as well as negative affect and loss of interest in daily activities within at least one year post-loss. (American Psychiatric Association, 2022).

In Asia, few empirical studies have investigated the prevalence of PGD among bereaved individuals, but these studies reported a wide range of estimates (i.e., 0 - 95.7% for PGD) (Djelantik et al., 2021; Xu et al., 2014). A potential cause for inconsistent findings among prevalence studies conducted in East Asia is the variety of death-related variables, such as relations to the deceased, causes of death, and PGD diagnostic tools. For instance, existing findings were mostly collected from specific populations such as victims of traffic accidents, natural disasters, or violent deaths (Li et al., 2015; Stammel et al., 2013; Yun et al., 2018). Grief-related distress following intentional causes or natural disasters is often exacerbated by the comorbidity of posttraumatic stress disorder (PTSD) (Nakajima et al., 2012; Sveen et al., 2018).

Similarly, grief following the loss of a child often outlasts the loss of other family members and its trajectory is often unpredictable (Dyregrov et al., 2003; Stroebe et al., 2007; Miyajima et al., 2014). For example, Yuan and colleagues (2022) estimated that 20.9% of Chinese parents who lost their only child, or Shidu parents meet the criteria for PGD. Sociocultural elements in China such as the ‘one child per couple policy’, filial duty, and the aging population are risk factors that can complicate Shidu parents grieving distress (Zhou et al., 2020). Hence, the diagnosis of PGD among bereaved parents remains unreliable and should not be generalized to the general bereaved population in East Asia.

So far, a large body of epidemiological research on PGD has been conducted in Western contexts with the majority of the samples being elderly white females (Maciejewski et al., 2016; Prigerson et al., 2021). Only Lundroff and colleagues (2017) reported a cross-continent rate of 9.8% with a lower rate observed in Eastern countries (9.2%). This result was a part of their systematic review’s sub-group analyses with studies published between 1994 and 2016. To our knowledge, only one previous meta-analysis reported the pooled prevalence rate of PGD with East Asian samples (Yuan et al., 2020). There has not been a systematic review combining the existing individual studies of PGD prevalence conducted in the general adult bereaved population of East Asia. A clear-cut estimate of the number of individuals experiencing severe distress following bereavement is much needed to raise awareness for

PGD among mental health service providers in East Asia when working with post-bereaved individuals. Thus, we aim to identify studies reporting the prevalence of PGD among those who lost a loved one due to natural causes in the East Asia region from 2010 to 2023.

## Methods

The methods and results were reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines (PRISMA) (Page et al., 2020). The single author independently performed the literature search, eligibility assessment, and data extraction. The author and a data analyst independently assessed the risk of bias (RoB) in the included studies. disagreements were resolved by the corresponding author.

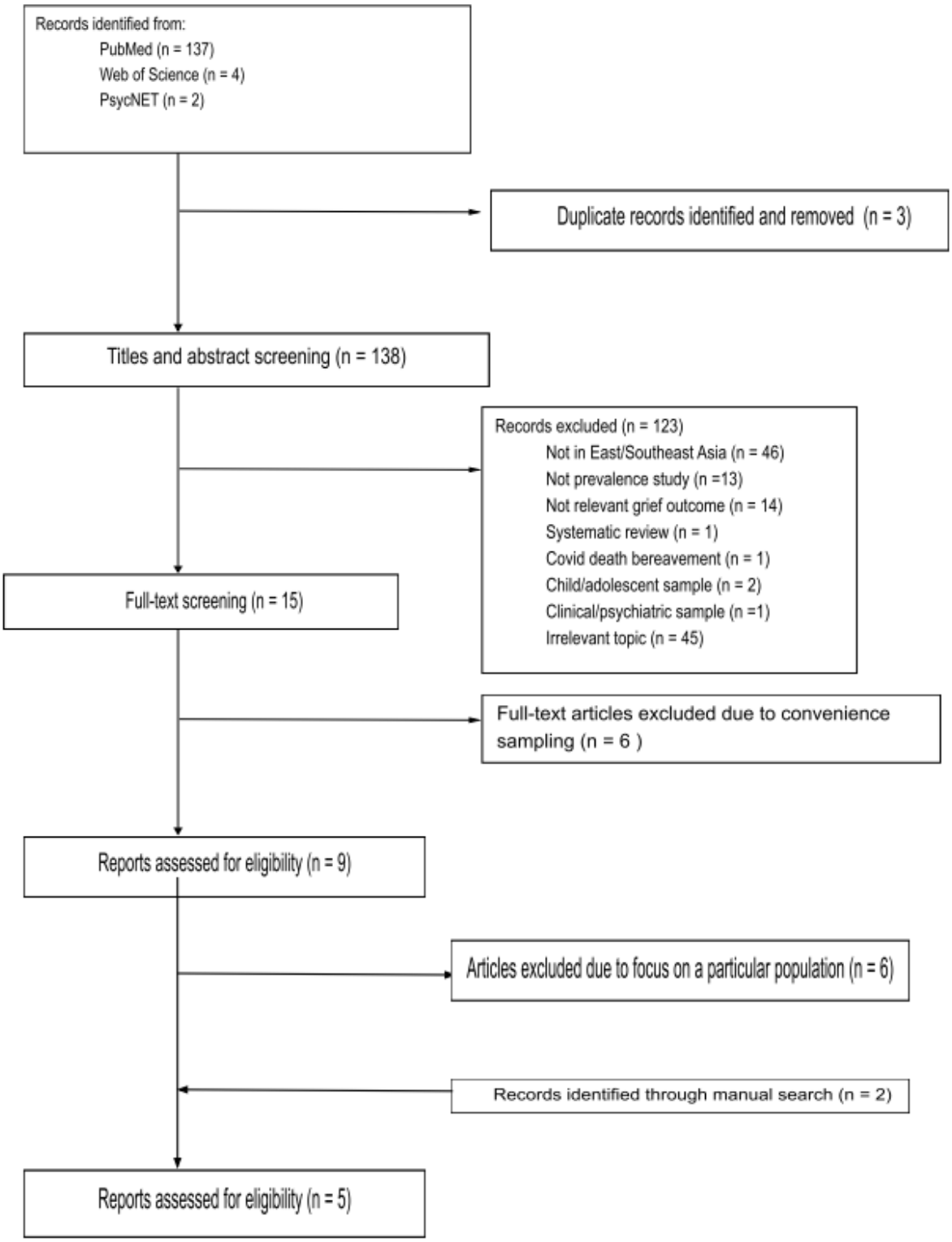
### *Literature Search*

A systematic literature search was conducted in PubMed, PsycNET, and Web of Knowledge using the following search terms: (“grief” OR “prolonged grief” OR “complicated grief”) AND (prevalence) AND (Asia). The single author independently performed the search throughout May 2023. Two studies were identified through a manual search of reference lists of the included articles.

### *Selection Criteria*

Epidemiological studies of bereaved adults (aged 18 years or older) who suffered the loss of a family member for at least 6 months were included. The outcome was either grief, prolonged grief, or complicated grief assessed with a standardized and validated diagnostic instrument. Studies that did not directly provide a prevalence estimate of PGD were not included. Geographical limitations were applied as studies conducted in countries within the East and Southeast Asia regions were included. Studies that reported irrelevant grief outcomes were excluded, together with studies reporting on other psychiatric conditions without PGD. Studies exclusively examine bereavement following violent deaths, deaths by natural disasters, and COVID-19 were excluded. Reports on the grief of children were excluded. Studies conducted on clinical or psychiatric samples were also excluded. Only original studies conducted in English between the period of 2010 and 2023 were included. Finally, studies that recruited participants through convenience sampling were not included as they tend to lack generalizability. To maximize the generalizability of the findings to the general population, studies investigating the prevalence rate of PGD among a particular population were also excluded (e.g., Shidu parents, bereaved family members of traffic accidents, and bereaved family members of an earthquake). Figure 1 illustrates the study selection process, resulting in the five studies included in the final analysis.

**Figure 1. Flowchart of study inclusion**




### *Data Extraction*

The following pieces of information were extracted from included studies: first author, publication year, survey country, study design, diagnostic criteria, diagnostic psychometric instrument, sample recruitment method, sample size, mean age of the study sample,

percentage of females, average time post-loss, relationship with the deceased, and number of subjects qualified for a PGD diagnosis.

### *RoB Assessment*

The possible RoB of the included studies were systematically assessed with the Joanna Briggs Institute Critical Appraisal Checklist for Studies Reporting Prevalence Data (JBI checklist) (Munn et al., 2015). This tool consists of nine items: four items address sample representativeness (sample frame, sampling method, sample size, description of participants and setting), three items address statistical methods (sample coverage of the data analysis, statistical analysis, response rate), and two items address accuracy of the outcome assessment (validity of the instrument for assessing the outcome, standardization, and reliability of the instrument). Each item can be answered with either 'yes, no, unclear, or not applicable'. Only 'yes' warrants a 1 whereas failure to meet methodological requirements of the guideline or failure to provide sufficient information for assessment results in a 0, which then yields a total score from "0-9". A higher score indicates a lower RoB and higher methodological validity.

### *Statistical Analysis*

The prevalence rate data from the included studies was synthesized by using the "Proportions" function within the "MAJOR" module of Jamovi, version 2.3 (The Jamovi project, 2022). The statistical software calculated the prevalence rate of PGD for each study using the inverse variance-weighted event rate (ER). That is the number of PGD diagnoses divided by the total sample size, yielding a weighted ER ranging from 0 to 1. The pooled prevalence rate was then calculated as an average of the weighted ERs. A random effect model was adopted over a fixed effect model to consider the differences in underlying characteristics of the studies' populations (e.g., mean age, average time post-loss, different causes of deaths, etc.). The $I^2$ statistic was calculated to describe prevalence estimate variation due to actual heterogeneity rather than sampling error (Higgins and Green, 2011). Publication bias was demonstrated with funnel plots and Egger's method (Egger et al., 1997). Additionally, subgroup analyses of countries and diagnostic instruments were performed using REVMAN, version 5.3. (The Cochrane Collaboration, 2020) to examine potential sources of heterogeneity.

## Results

### *Study Characteristics*

Participant characteristics and study designs of the five unique studies included are summarized in Table 1. Five studies published between 2010 and 2016 were included in the final analysis (Fujisawa et al., 2010; He et al., 2014; Li & Prigerson, 2016; Miyajima et al., 2014; Mizuno et al., 2012) with a total of 4004 bereaved participants ($M$ = 800.8, $SD$ = 233.1). Three studies were conducted in Japan (Fujisawa et al., 2010; Miyajima et al., 2014; Mizuno et al., 2012) and two were conducted in China (He et al., 2014; Li & Prigerson, 2016). All of the included studies used cross-sectional surveys (self-report) to assess the participants' level of pathological grief. Li and Prigerson (2016) used voluntary response sampling and He et al. (2014) used cluster sampling, while the rest used random sampling methods (Fujisawa et al., 2010; Miyajima et al., 2014; Mizuno et al., 2012). PGD symptoms were asses with three different diagnostic instruments: Fujisawa et al. (2010), Miyajima et al.

(2014), and Mizuno et al. (2012) used the Brief Grief Questionnaire (BGQ); Li and Prigerson (2016) used the Inventory of Complicated Grief (ICG); and He et al. (2014) used Prolonged Grief-13 (PG-13).

**Table 1. Characteristics of studies included in the Meta-Analysis**

| Authors (year) | Country | Design | Diagnostic Tool | Sample recruitment | Population | Meantime post-loss | Relationship with the deceased |
|---|---|---|---|---|---|---|---|
| Fujisawa et al., (2010) | Japan | Cross-sectional self-report | Complicated grief, BGQ | Random sampling through census tract. | N = 969, 58.2% female; 56.32 years | 72 months | 6.3% spouse; 48.3% parents, 25.5% in-law; 9.9% siblings; 10% other |
| He et al., (2014) | China | Cross-sectional self-report | Prolonged grief, PG-13 | Adults recruited through universities, hospitals, and the community. Cluster sampling. | N = 445; 78.4% female, 27.6 years | 55 months | 23.9% parent; 1.8% child; 2.5% spouse; 2.9% sibling; 58.5% grandparents; 10.4% other |
| Li and Prigerson (2016) | China | Cross-sectional self-report | Prolonged grief, ICG | Adults who lost first-degree relatives were recruited through memorial websites. Voluntary response sampling. | N = 1099; 51% female; 41.85 years | 26 months | 40.1% father, 32.0% mother, 6% child, 11.3% spouse, 10.6% sibling |
| Miyajima et al. (2014) | Japan | Cross-sectional self-report | Complicated grief, BGQ | Random sampling of adults who lost a loved one between 6 months and 10 years through census tract. | N = 641; 54.9% female; 58.93 years | 53.6 months | 5.5% spouse, 51.0% parent, 26.5% parent-in-law, 7.8% sibling, 9.2% other |
| Mizuno et al. (2012) | Japan | Cross-sectional self-report | Complicated grief, BGQ | Individuals over 18 who had experienced the loss of family members. Stratified two-stage random sampling method. | 850; 53.3% F; 51.00 years | 142.8 months | NR |

Abbreviations: BGQ, Brief Grief Questionnaire (Shear et al., 2006); ICG, Inventory of Complicated Grief (Prigerson et al., 1995b); ICG-R; NR, information was not reported in the original study and could not be calculated; PG-13, Prolonged Grief-13 (Prigerson et al., 2009).

Regarding gender, female-identifying participants comprised the majority of the study participants with an average of 59.2%. Participant's mean age ranged from 27.6 (He et al., 2014) to 58.93 years (Miyajima et al., 2014), and the overall mean age was 47.14 years (*SD* = 11.4). The five studies included subjects who differed in the type of loss experienced. This included the loss of partners, parents, children, siblings, grandparents, parents-in-law, and others. Mizuno et al. (2012) did not report the bereaved relation to the deceased.

### *RoB Scores*

The JBI checklist scores of the five included studies ranged from six to nine (see Table 2). The most common methodological problem of the included studies was sample representativeness, specifically the sample frame was not appropriate to address the target population of the study (K = 3).

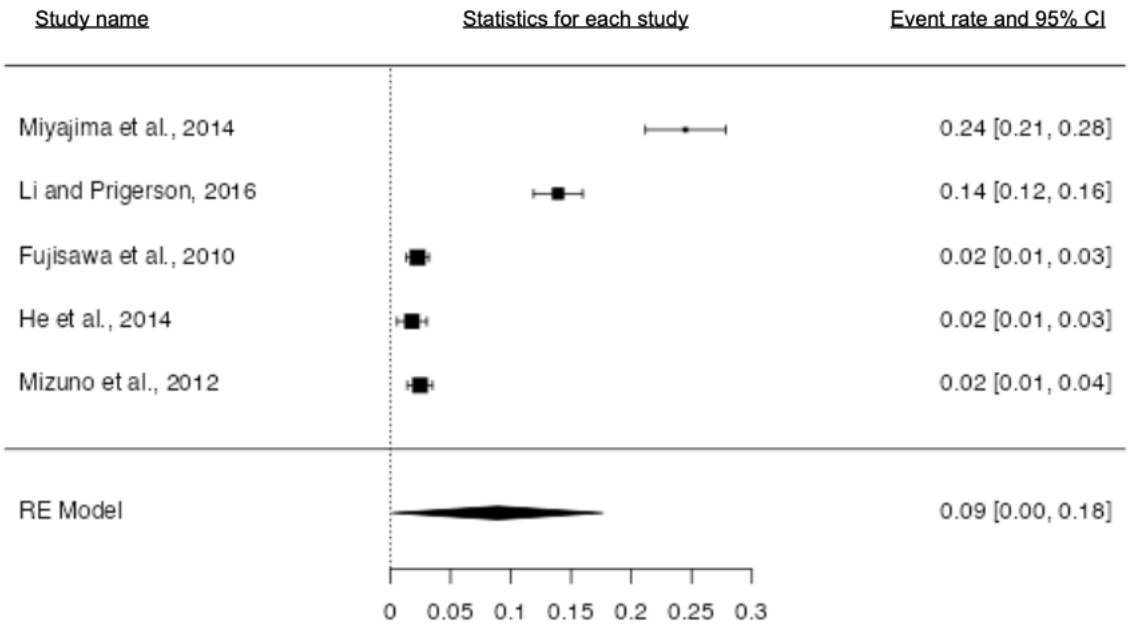
**Table 2. Risk of bias assessment of included studies**

| Authors (year) | 1. Sample frame | 2. Sampling method | 3. Sample size | 4. Description of participants | 5. Sample coverage of data analysis | 6. Validity of instruments | 7. Standardization and reliability of the instrument | 8. Statistical analysis | 9. Response rate | Total RoB |
|---|---|---|---|---|---|---|---|---|---|---|
| Fujisawa et al., (2010) | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| He et al., (2014) | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| Li and Prigerson (2016) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 |
| Miyajima et al. (2014) | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| Mizuno et al. (2012) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 |

### *Meta-Analysis*

The pooled prevalence rate of PGD of 4004 bereaved participants across five studies in China and Japan was 8.90% (95% CI 0.2 - 17.6) (see Figure 2). The funnel plot for the main analysis appeared asymmetrical and Egger's tests ($z = 9.334$, $p < .001$) indicated statistically significant publication bias. Furthermore, analyses revealed the ERs to be highly and statistically significantly heterogeneous ($I^2 = 99.5\%$, Q = 268.1, $p < .001$).

**Figure 2. Forest plot of random effects model meta-analysis of prevalence estimates (event rate) with 95% confidence intervals**




### *Sub-group Analyses*

Possible sources of heterogeneity were explored through two sub-group analyses of countries and diagnostic instruments. When comparing studies conducted in China and Japan, the pooled prevalence rate of PGD was higher in studies conducted in Japan (10%) than in studies conducted in China (8%). There was statistically significant heterogeneity between China and Japan ($p < .0001$). Analysis of the instruments used to assess PGD revealed statistically significant between-group differences ($p < 0.0001$). The pooled prevalence rates of PGD for the studies that had used the PG-13, ICG, and BGQ were 2%, 14%, and 10% respectively.

## Discussions

This first systematic review and meta-analysis of the prevalence of PGD in East Asian countries suggests that nine out of one hundred non-violent bereaved adults in East Asia are at risk for PGD. Notably, our reported rate for East Asian countries of 8.9% is lower than the previously found rate for East Asian countries of 9.2% (Lundroff et al., 2017), however, the contrast is only due to event rate rounding differences. That is, Lundroff and colleagues rounded to four significant figures while we rounded to two. Nonetheless, the pooled prevalence rate of 8.9% is consistent with their findings that pathological distress following bereavement is less prevalent in Eastern countries compared to Western countries (10.1%). This difference can be attributed to cultural differences in the bereaved individuals' attitudes surrounding death as well as differences in grief expression and coping. Throughout the mourning period, rigorous rituals are performed by the bereaved family to pay respect to the deceased. Such religious rituals might protect the bereaved against the development of PGD as they bring a sense of meaning and connectedness in times of grief (Jegathesan, 2020; Schaal et al., 2010). Mourning rituals do not just provide support at the time of death but also help family members adjust over the mourning period. Bereaved individuals in Eastern countries are obligated to repetitively perform related ritualistic activities over the mourning

period, which forces them to confront the death of their loved ones and may help with the avoidance aspect of pathological grief (Djelantik et al., 2021).

Additionally, the high degree of methodological heterogeneity within the included studies also contributes to the varying prevalent rates of diagnosis. The included studies used several different sets of diagnostic algorithms for PGD, the PG-13, ICG, and BGQ (Prigerson et al., 1995; Prigerson et al., 2009; Shear et al., 2006), each with its own criteria and cutoff score. While these U.S.-based questionnaires have been translated and validated for cross-cultural research on grief, the inconsistencies across these diagnostic tools pose a threat to the validity of prevalence rates findings for PGD outside the U.S. (Stelzer et al., 2020). Moreover, the expression of grief differs cross-culturally despite grief being a universal experience. Thus, culturally bound symptoms of grief might have gone unnoticed when diagnosed with these validated scales (Killikelly et al., 2018). In many East Asian countries such as Japan and Taiwan China, public display of grief is considered taboo, mourning could then only be expressed privately as a family when performing culturally specific mourning rituals (Kim, 2015; Gudmunsdottir et al., 1996; Tseng et al., 2018). As a result, intense negative affect surrounding the death might not be fully captured within clinical or research settings, risking underestimation of the disorder. Moreover, although PGD is included in both the ICD-11 and the DSM-5-TR American Psychiatric Association, 2022; World Health Organization, 2022), the two manuals do not fully agree on the diagnostic criteria of the disorder (Hilberdink et al., 2023). Duration of grief might be the most unreliable criterion since the two manuals disagree on the required duration, even more so when the length of the mourning period varies across cultures. For instance, Confucian beliefs in East Asian countries dictate that the mourning period should last three years. Surprisingly, diagnostic algorithms do not consider the sociocultural norms of mourning. Cross-cultural variability of grief questions the global applicability of the diagnosis of PGD.

As there are still many cross-cultural caveats regarding the presentation of pathological grief, there is a need for more than just a translated version of a Western-developed diagnostic algorithm to ensure the validity of the PGD diagnosis in non-Western populations. A culturally appropriate assessment of PGD should include cultural elements surrounding death such as social norms, religious beliefs and practices, and local expressions. To our knowledge, only the International Prolonged Grief Disorder Scale developed for the ICD-11 (World Health Organization, 2022) includes culturally bound symptoms (Killikelly et al., 2020). Future research aiming to estimate the prevalence of PGD for a specific population should also consider incorporating clinical interviews conducted by native clinicians on top of an adapted scale to ensure validity and generalizability.

The present review has a high level of internal validity since all included used a cross-sectional design and directly surveyed bereaved participants. There is also evidence for strong external validity since all participants were randomly recruited. However, the findings cannot be generalized to the larger East Asia region as the number of eligible studies for this meta-analysis is small and limited to only Japan and China. Our review included the exact same studies conducted in East Asia as Lundroff and colleagues (2017) despite being conducted six years later. None of the included studies were free from risks of bias. Three studies had methodological bias in sample framing, one had sampling method bias, and one had sample size bias. Another issue that hampers the review's generalizability is having English-only as an inclusion criterion despite focusing on East Asian countries. Additionally, there was a high degree of methodological heterogeneity characterized by considerable variability in diagnostic tools, cutoff scores, and death-related variables such as time since

loss and relationships with the deceased. This limits the comparability between included studies.

## Conclusions

The paper offers a first attempt at estimating the prevalence of PGD in East Asian populations, adding to the growing field of grief and bereavement. Our results further confirm earlier findings of a lower rate in the prevalence of PGD among bereaved adults in Eastern countries, highlighting the need to consider underlying cultural factors. However, our findings should be interpreted with caution due to the considerable heterogeneity between studies as well as the lack of generalizability to other Eastern Asian countries. Nonetheless, this research presents an opportunity to improve the global applicability of the PGD diagnosis by starting to look within cultures.

## Acknowledgment

The author would like to thank Chenchen Lin for the help in carrying out the meta-analysis and Dr. Clare Killikelly for the supervision.

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# *Consumers' Feedback in Mathematics and Psychology Proceeding*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
The aim of this study is to evaluate customer feedback using three distinct models: the Need model, Feedback model, and Network model. McClelland's (1985) motivation theory underlines that consumer feedback represents requirements, symbolizing a human drive at the tail of the vector. The action regulation theory (Frese & Zapf, 1994) characterizes consumer feedback as modifiers, resulting in its portrayal as a human adjective at the vector's tip. Finally, the actor-network theory (Latour, 2005) describes consumer feedback as an affect within a social network that dictates the vector's direction. Through the amalgamation of mathematical and psychological principles, a comprehensive model has been devised for hoteliers to implement effective strategies in meeting guest expectations. To formalize a vector consisting of a tail (need), a tip (goal), and a direction (network), the study has applied linear transformation to derive an integrated model from the three models. To analyse the data gathered from 1000 TripAdvisor comments from 2018 to 2023, Linguistic Inquiry Word Count was used to categorize the feedback into human drives and affect. Structure Equation Modelling was utilized to establish connections between consumer factors and marketing elements, resulting in the identification of three pairs: affect-pricing, adjectives-advertising, and drives-servicing. The practical implications of this research indicate that during the low season, hoteliers should emphasize pricing at the vector's tail. Conversely, in high season, they can shift their focus to advertising at the vector's tip. The vector's direction depends on servicing. This study underscores the integration of mathematics and psychology in comprehending consumer behaviour.

Keywords: Implicit, Explicit, Vector, Need Model, Feedback Model, Actor-Network Model, Linguistic Inquiry Word Count

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## Introduction

Failure to effectively apply mathematical modelling to optimize hotel guest satisfaction results in two significant gaps for hoteliers, hindering revenue maximization. The first gap emerges between the overarching goals of hotels and the real-time feedback provided by contemporary customers. The second gap exists between the tangible determinants of perceived overall satisfaction and the underlying implicit factors of customer motivation and emotional expectations. Hotel revenue optimization has become increasingly challenging in meeting guest expectations amidst the advancements of the latest technological era.

In this study, a vector representing the position of the vector's tail during low season and its peak during high season comprises two numbers. These numbers delineate the interplay of implicit and explicit factors affecting hotel revenue within a linear system of two axes. The numerical values at the tails and tips of the vector reflect the respective impacts of implicit and explicit factors.

Seven explicit variables sourced from TripAdvisor, including overall satisfaction, location, value, room quality, service, sleep quality, and cleanliness, along with two implicit variables—consumer drives from the Need model and affect from the feedback model—were extracted from 1000 comments gathered from hotels in the southeast region of the United States using Linguistic Inquiry Word Count.

## Literature

The dynamic interaction between consumers' feedback and hoteliers' actions reveals a notable discrepancy, a phenomenon highlighted by three academic theories. These theories shed light on the multifaceted nature of this gap and its implications for the dynamics of the hospitality industry.

Firstly, McClelland's (1985) motivation theory and Tran and Ralston (2006) underscore consumers' feedback as a pivotal driver of business needs. Within this framework, feedback acts as a catalyst, motivating hoteliers and shaping their strategic decisions. It serves as a reflective mirror, echoing the desires and expectations of consumers, thereby compelling hoteliers to align their endeavours with these insights.

Expanding on this foundation, the action regulation theory, advocated by Frese and Zapf (1994), Frese and Keith (2015), Frese, Kraus, Keith, Escher, Grabarkiewicz, Luneng, and Friedrich (2007), and Zacher and Frese (2018), portray consumers' feedback as an integral component of an ongoing process. Here, feedback operates as a dynamic mechanism regulating hoteliers' actions. This cyclical process ensures not only the receipt of feedback but also a responsive adjustment of strategies to bridge the gap between consumer expectations and service delivery.

Furthermore, Latour's (2005) Callon's (1998), and Akrich (2006) actor-network theory introduces a distinct perspective, emphasizing the network formed by hoteliers' actions. Within this framework, hoteliers' responses to consumer feedback serve as pivotal nodes within an intricate network. These actions intertwine with various elements, both internal and external, influencing the evolution of the service delivery ecosystem. The theory elucidates how the feedback-action loop is intricately connected within a broader network of actors and influences.

Collectively, these theories illuminate the nuanced dynamics between consumers' feedback and hoteliers' actions, offering insights into the ways in which the feedback-action nexus shapes the trajectory of the hospitality industry. Recognizing and addressing this gap becomes imperative for hoteliers aiming to thrive in an environment where consumer preferences and business strategies intertwine.

Additionally, the Linguistic Inquiry Word Count (LIWC, 2022) by Mehl, Gosling, and Pennebaker (2006), Pennebaker and King (1999) and Pennebaker, Boyd, Jordan, & Blackburn (2015) provide a comprehensive lens through which linguistic expressions are analysed, encompassing various elements such as pronouns, emotional facets, cognitive processes, and motivational drives. This multidimensional framework unveils how language reflects and interacts with personality traits, shedding light on the intricate interplay between communication patterns and individual disposition.

TripAdvisor's hotel criteria encompass six dimensions that relate to the underlying marketing elements, as proposed by Borden (1964), in the theories of motivation, action regulation, and actor-network. These criteria include location, cleanliness, rooms, value, sleep quality, and service. Each criterion reflects different facets of consumer expectations and preferences, influencing their overall satisfaction and perception of a hotel's quality.

The fluctuation in occupancy rates in Pensacola is closely linked to the different quarters of the year, reflecting trends observed in both 2015 and 2016. During these years, occupancy rates followed distinct patterns across the four quarters:

- Quarter 1: This period showed lower occupancy rates. In 2015, it was 54.9%, improving slightly to 58.4% in 2016.
- Quarter 2: The second quarter boasted the highest occupancy rates. In 2015, it reached 67.2%, increasing to 70.3% in 2016.
- Quarter 3: The third quarter displayed the second-highest occupancy rates. In 2015, it stood at 52.3%, rising significantly to 69.1% in 2016.
- Quarter 4: The final quarter marked the lowest occupancy rates. In 2015, it dropped to 58.4%, further decreasing to 55.9% in 2016.

These variations underscore the dynamic nature of Pensacola's occupancy rates throughout the year, with each quarter experiencing different levels of occupancy. Understanding these quarterly trends can offer valuable insights for planning and decision-making within the hospitality and tourism sectors.

In summary, this study is motivated by the design of needs/action, process/sequence, and theme/goal supported by the three theories of motivation, action regulation, and actor-network. The two hypotheses of the study posit that (1) implicit factors, such as drives and affect in guests' comments, significantly directly impact hotel average daily rate, while (2) explicit or self-report factors directly and indirectly affect average daily rate through these implicit factors.

## Methodology

### *Study Sample*

The study comprised 1076 hotel guests, with 509 females and 567 males, who posted their comments on social media platforms, including TripAdvisor, over a five-year period from 2019 to 2023. These guests stayed in five different hotel brands, namely Hampton Inn Pensacola Beach Gulf Front, Florida; Hilton Pensacola Beach Gulf Front, FL; Holiday Inn Resort Pensacola Beach Gulf Front, FL; Hyatt Place Pensacola Airport, FL; and Surf and Sand, Pensacola Beach, FL.

### *Structure Equation Modelling*

To establish a model fit between comments, strategies, and yearly quarters, the present study employed Structural Equation Modelling (SEM). This analysis aimed to explore the relationship between customer feedback variables (location, rooms, cleanliness, service, value, and sleep quality) and marketing strategy variables (branding, physical handling, fact-finding, servicing, promotion, pricing, personal selling, distribution, advertising, display, product planning, and packaging) within specific yearly quarters.

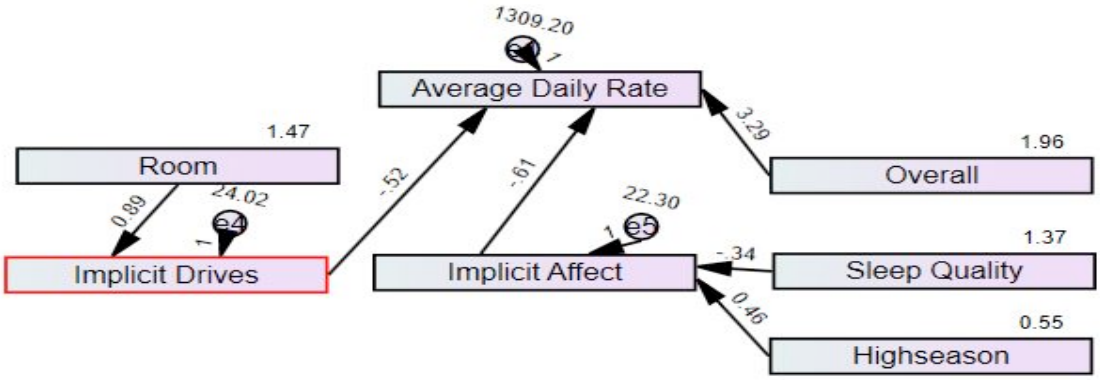
Structural Equation Modelling (SEM) is a statistical approach used to examine relationships between observed variables (such as 12 marketing strategies, 6 hotel demand criteria, and 4 quarter dummies) and latent variables, which represent the errors of the strategies.

SEM models were evaluated based on various goodness-of-fit indices, including the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Additionally, the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) were used for model selection.

## Results

The reliability of the variables in the study was confirmed with a Cronbach's Alpha of 0.7. The model demonstrated a good fit, with composite reliability of .92 and variance extracted of 70%. The fit indices (CMINs/df = 1.01; GFIs = .95; CFIs = .97; RMSEAs = .02, AICs = 45.1) supported this conclusion.

Figure 1 illustrates the implicit drives and implicit affect in guests' comments significantly impact hotel average daily rate, while the explicit factors directly and indirectly affect average daily rate through these implicit factors. Specifically, the explicit variable of room indirectly affects average daily rate through implicit drives. Additionally, the explicit variable of sleep quality in the high season indirectly affects average daily rate through the implicit variable of affect. Hypotheses 1 and 2 were confirmed based on these findings.




Source: Author's calculation

Figure 1: Model fit of hotel revenue (ADR) determined by (1) implicit drives supported by room, (2) implicit affect characterized by sleep quality and high season, and (3) explicit overall.

## Discussion and Conclusion

In this study, the vector represents a pair of numbers denoting a specific position along the vector's tail for the low season and its tip for the high season within a linear system characterized by two axes: implicit and explicit factors. Seven explicit variables, obtained from TripAdvisor, including overall satisfaction, location, value, room quality, service, sleep quality, and cleanliness, were utilized. Additionally, two implicit variables, derived from the Need model and the affect component of the feedback model, were integrated. Despite the relatively small sample size of 1000 consumers in the US, the study addressed the gap in understanding the vector and its association with hotel revenue by establishing the vector's positions for both low and high seasons across the two axes of implicit and explicit factors. These numerical representations reflect the impact of implicit and explicit factors on hotel revenue.

McClelland's (1985) Need model highlights how consumers' drives expressed in their comments influence their decision to stay at a hotel, thus affecting hotel revenue. Similarly, Frese and Zapf's (1994) feedback model emphasizes how consumers' affect in their feedback influences their choice to stay at a hotel, thereby impacting hotel revenue. Finally, Latour's (1996) actor-network model depicts consumers' overall self-report as a human factor intertwined with the non-human aspect of hotel revenue, resulting in an actor-network between overall satisfaction and hotel revenue.

The societal implications of this research on optimizing hotel revenue underscore how guest feedback shapes the trajectory of a vector. Positive feedback steepens the vector, indicating increased resilience to price changes, leading to higher room rates and hotel revenue. Conversely, negative feedback flattens the vector, resulting in reduced room rates and ultimately decreased revenue. The study suggests strategies for hotel revenue optimization, such as emphasizing reduced room rates and advertising sleep quality during the high season, while promoting room availability for guests with affective comments during the low season to enhance overall guest satisfaction.

This study highlights the integration of mathematics and psychology in understanding consumer behaviour.

A limitation of the study is the relatively small sample size of 1000 comments, which may impact the generalizability of the findings. Nonetheless, the study's identification of implicit and explicit relationships affecting hotel revenue contributes to the literature and practice in hospitality and tourism research. Future research will focus on the north and central regions of the US to broaden the study's scope.

**Acknowledgements**

The author of the paper declares that there is no conflict of interest.

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# *Psychopaths, Sociopaths, and Serial Killers: Engaging Undergraduate Students in Innovative Psychology Programming*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
Three programs were developed to increase undergraduate enrollment in psychology. In Program 1, one-credit-hour, media-intensive Weekend Seminars (WS) were offered without prerequisites. Modeled after professional congresses, these seminars included, "Psychopaths, Sociopaths, and Serial Killers," "Sex, Drugs, and Rock n' Roll," "How To Take Over The World In One Easy Lesson," and "Behavioral Addictions: Psychopathology or Moral Depravity?" Theoretical frameworks, symptoms, interventions, and practical information, e.g., "how to avoid being targeted by a serial killer" and "protecting children from pedophiles," were presented. Group "problem-solving" tasks were included. Similar to professional congress experiences, students were provided coffee and snacks breaks, lunches, and other amenities. Student motivation for these courses included, "curiosity," "need" for credit hours, and "interest" in psychology. In Program 2, the International Psychology Congress Program (IPCP) was developed enabling advanced psychology majors to earn three-credit-hours attending conferences. Cultural immersion opportunities were provided. Post-congress, students developed research proposals to operationalize in a follow-on course. Forty-five percent of students enrolled in the IPCP have attended graduate school in psychology or a related field; a majority of the remaining students took employment in the field. In Program 3, a "psychology and social justice" course was developed with students intervening to help refugee youth in Lebanon and Poland. This presentation assisted attendees in identifying topics of interest for students, create these courses, and assess their impact on student satisfaction and interest in psychology and the neurosciences. Programs are also identified as a platform for future research.

Keywords: Innovation, Psychology, Education

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## Introduction

An undergraduate student's first exposure to the field of psychology is often through 100-Level, Introduction to Psychology coursework. By its nature, this coursework provides a broad overview of the field without a deep or profound exploration of those aspects of psychology students find most interesting. Several innovative undergraduate courses with high interest value were developed enabling a more profound exploration of psychology as a course of study, career option, platform for social justice intervention, and future research activities.

## The Courses, Their Procedures, and Findings

Twenty-five iterations of the Weekend Seminar (WS) have been offered with six different courses of interest presented. For each iteration, fifteen faculty-student contact hours on one Friday afternoon/evening and all-day Saturday were accomplished in these media-intensive programs. Student learning was evaluated via computerized tests/quizzes administered through the Moodle platform assessing knowledge and the ability to apply learned information. Four-hundred fifty-six credit hours were earned by students between 2015-2024, the period of this review. An average enrollment of approximately 20 students was noted with at least two courses currently offered each semester. A majority of students enrolled in WS programming were non-psychology majors (77.8%). Psychology majors tended to reenroll in WS programming (on a different topic each time) 49.35% of the time while non-psychology majors reenrolled 17.51% of the time. Student motivation for course enrollment included interest in the topic (55.5%), accessing a "safety credit" (37.7%), and "need" for one credit hour to meet graduation requirements (35.3%). Surveys (5-point Likert-type scale) completed by the most recent 45 enrollees revealed that students found the topics to be "interesting" (4.67/5.00), learned "a lot" about the topic (4.71/5.00), and would "recommend the course" to other undergraduates (4.64/5.00). Students also reported that the "title" of the course, designed to spark interest, was important in their decision to enroll (4.54/5.00). Learning objectives including an introduction to the biopsychosocial model (4.29/5.00), symptoms of disorders/problems (4.71/5.00), and discussion of interventions (4.36/5.00) were met. A sample of thirty-nine students who chose not to enroll in the WS revealed that a sizeable percentage would not want to take a course on a weekend (82.1%), roughly three-fourths had not "heard" of the program (74.3%), and one-third did not find the topics offered to be "interesting" (33.3%). Funding for each iteration of the WS course was accomplished through student tuition payments and a course fee specifically designed to keep the program "budget neutral."

Forty-five students enrolled in the International Psychology Congress Program (IPCP) over its six iterations. Students attended congresses in Vienna, London/Brighton, Amsterdam, Berlin, Melbourne, and Prague and have engaged in cultural immersion activities in each locale including traditional meals and visits to First Nations reserves and historic sites such as Stonehenge. Forty-five percent of IPCP students subsequently enrolled in graduate school. Two iterations of the Social Justice (SJ) program have been completed under the direction of Dr. Cosette Fox, Ph.D. (CFox@hcc-nd.edu). Data on "growth mindset" has been gathered in the SJ program; this research has either already been published, is under review, or is in preparation for review.

## Faculty Engagement Strategies

Engaging faculty to "work on weekends" or lead travel abroad was viewed as a challenge. Participation was facilitated by providing a one-credit hour "adjunct" course salary for each

Weekend Seminar iteration. Faculty were encouraged to create courses reflecting their "passions" and "interests." Administratively, faculty "paperwork" was reduced through computerized assessment of students. Additional faculty paperwork "reduction" was accomplished by reducing administrative requirements for course approval. Following the initial approval of the Weekend Seminar program, faculty were allowed to develop new courses under this course title without having to submit lengthily formal documentation of the course design, goals, and topics. Faculty who led study abroad courses including the IPCP and SJ programs were paid a three-credit-hour adjunct salary and had all expenses covered including those associated with professional/medical continuing education (CME) for clinical faculty.

## Funding

College administrators indicated that they would be most receptive to innovative programming if courses were "budget neutral." Students enrolled in the Weekend Seminar series paid a $50 course fee. This covered "amenities" provided to students including meals, snacks, coffee breaks, and supporting course materials. Given the international travel component of the IPCP and SJ programs, more funds were required to attain budget neutrality. While a majority of students self-funded a portion of their experiences, benefactor donations and financial assistance from the college based on FAFSA financial aid eligibility was provided to reduce costs to more than half of the students. Student tuition payments to the college for these courses covered faculty salaries. Budget neutrality has been accomplished across all iterations of the WS, IPCP, and SJ programs.

## Moving Forward

Moving forward, the WS and SJ programs will be used as research platforms to gather data on psychological interventions. A "Positive Psychology" (PP) Weekend Seminar is scheduled. This course will assess the impact of a PP workshop format on student well-being and assist in determining if a modified PP program could be included in student orientation activities prior the enrollment in the First Year. Future WS, IPCP, and SJ programming is being developed to engage students in these impactful experiences.

## Conclusions

Engaging undergraduates in psychology programming is essential for the vitality of the field. Innovative programming can serve as a "lure" to students unsure if psychology is a course of study they would like to pursue. Innovative programming may also allow faculty to "stretch" their "creative legs" and develop programming they can enjoy based on their personal passions. Programs developed and ongoing at Holy Cross College at Notre Dame, Indiana USA have proven an attractive option for students who indicate that they acquire valuable knowledge regarding the field.

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# *Study on Impact of Performance Management and Rewards on Organization's Talent Environment*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
With growing complexity and uncertainty in the current business environment, it is imperative to protect and retain organization's talent pool. Performance Management (PM) System is a business tool that provides direction to the organization and subsequently facilitates the organization to achieve its long-term goals. Performance management plays a pivotal role in shaping employee behaviour by driving overall performance of an employee within organisational set-up. PM System links performance with rewards to inspire the talent environment (TE) thus performance-linked reward model stimulates a performance-driven culture in the organization where high-performance yields higher rewards, thus creating a positive behavioural ripple. This paper delves into the intricate dynamics of performance management systems, exploring its correlation with performance rewards and their overarching impact on the talent environment within the organization. A systematic qualitative study has been conducted to gauge the correlation between performance, rewards and talent. Limitations of the study are discussed further in the paper.

Keywords: Talent Environment, Performance Management, Rewards, Intrinsic and Extrinsic Rewards, Talent Management, Learning, Career

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## Introduction

Many organizations have a process in place to drive performance management (PM), but very few organizations drive the PM exercise with intent, and even fewer establish the correlation between performance and rewards by differentiating performance. The objective of PM is to facilitate an employee to utilize their full potential, while performance appraisal is the part of PM that evaluates their performance and potential. Performance and rewards have a significant impact on the talent environment of the company, and high-performing organizations ensure that a large proportion of rewards should be given to talent who exhibit consistent high performance and have potential to deliver in the future. When talent is rewarded, performance behaviours possessed by talented people becomes an attraction point for other employees, thus creating a high-performance culture. This study presents a holistic performance-reward-talent (PRT) view and establishes the correlation between performance and rewards to positively impact the talent environment of the organization, ultimately achieving the organizational objectives and creating a high-performance culture.

## Research Questions

Research gaps are identified through available studies in the field, which lead to the research questions. Literature reviews critically evaluate the existing research, synthesise the study, identify problem areas and develop a strong proposal for the thesis. The literature review leads to the following questions:

1. How do performance and rewards impact the talent environment?
2. How is a high-performance culture developed?
3. How is talent retained?
4. How organisational commitment is developed?
5. How is talent developed to create a talent pipeline?
6. How to create internal brand ambassador?
7. How to create brand advocates?

## Research Objective

This study aims to focus on factors impacting the talent environment of an organization that are specifically related to performance management and rewards. Primarily there are four research objectives:

A1.To understand impact of performance management and rewards on talent environment
A2.To examine the impact of performance management on talent environment
A3.To examine the impact of rewards on talent environment
A4.To evaluate the significance of variables on each other

## Literature Review

This paper presents views of Indian and international authors who have conducted qualitative and quantitative studies on PM, rewards and TE. PM covers objective setting, reviews, feedback, coaching, counselling, evaluation and management of low performance. Rewards are categorised into extrinsic rewards, intrinsic rewards, career progression and learning opportunities.

- Extrinsic rewards cover performance increase, performance variable pay, performance incentive (long-term and short-term incentives), retention bonus and employee stock options.
- Intrinsic rewards are psychological in nature and ignite positive emotional reactions. It covers aspects such as work-life balance, work recognition, autonomy, empowerment and praise from seniors.
- Career progression covers long-term talent movement strategies such as promotion, upgradation, job enrichment, job enhancement and setting challenging assignments within the organization.
- Learning opportunities are provided to an employee to develop their skills and competencies for future roles.
- Talent environment (TE) signifies employee point of view about company's talent management (TM) process and its implication on him or her towards career progression and development, which subsequently results in, employee taking key decisions related to continue job with the company, positively advocate about the company and commitment towards the job. Talent environment is an employee perspective about his or her career expectation from the company compared to company's TM process. Great companies are able to match employee expectations through formal TM process, which leads to employee retention, high performance culture, strong commitment towards the organisation, building a robust talent pipeline and company advocacy.
- Talent signifies an employee who has the ability to move vertically and horizontally, cross-functionally, geographically and across businesses within the organization to take up higher-level roles.

The study involves a detailed review of the literature from various sources including Google Scholar, EBSCO, ProQuest and ResearchGate on subjects like performance management, extrinsic rewards, intrinsic rewards, career development, learning and talent. The study catalogues five independent variables that have a high impact on talent environment (TE):

1. Performance management (PM)
2. Extrinsic rewards (ER)
3. Intrinsic rewards (IR)
4. Career progression (CP)
5. Learning opportunities (LO)

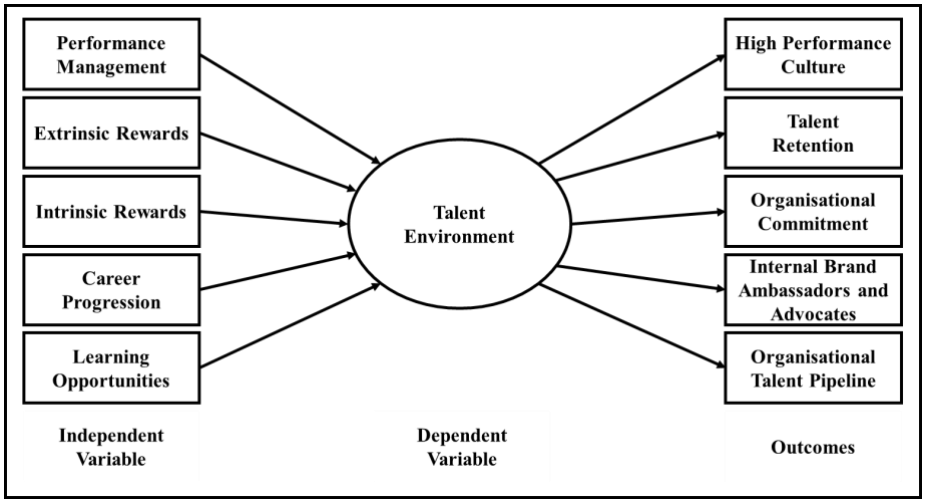



***Figure 1: Talent Environment Framework***

## *1. PM*

PM is the 'Achilles heel' of human capital management, often viewed as ineffective by employees and managers. Continuous ongoing activity throughout the year reflects effective PM behaviour whereas a few intermittent activities during the year are signs of poor PM behaviour (Pulakos, Mueller-Hanson, O'Leary, & Meyrowitz, 2012). Organisations should continuously work on setting expectations, offer regular feedback and support employees in achieving career goals. PM is an integrated model that covers performance measurement to focus on time, cost and quality dimensions and performance improvement to focus on cost reduction, profit, goodwill, customer satisfaction and future business growth (Parthiban & Goh, 2011). Performance appraisal is important for improving employee performance, motivation, satisfaction and overall development (Mufeed & Shah, 2017).

Performance objectives and organisational vision and mission are key ingredients of PM, and they display a strong relationship with organisational effectiveness (Kumar P. , 2019). PM practices are fast changing, not only in the private sector but also in the Indian Public and Government sector. In the last 15 years, the Indian public sector has seen various schemes, including the Annual Confidential Report (ACR), the Annual Performance Appraisal Report (APAR), the 360-degree review or Multi Source Feedback (MSF) and Performance Related Pay (PRP), to differentiate high performance. There is a major transition from performance evaluation to talent development and supervisor feedback to multi-source feedback (Unnikrishnan, Sharma, & Sharma, 2022). With a high focus on feedback and demerits attached to appraisals, especially negativity around performance ratings due to the application of the Bell curve, companies are abandoning performance appraisal to focus on people development, agility to innovate and centrality of teamwork (Cappelli & Tavis, 2016). Managers define, facilitate and encourage performance to meet individual goals and strategic organisational objectives (Cascio, 2012).

The ambiguity around the PM system is continuous when it comes to linking goals with performance measures. Organisations need to focus on establishing the correlation between goals and expected performance deliverables from an employee, which can be strengthened through effective and continuous feedback system. When an employee receives continuous feedback, mentoring and counselling, it improves overall work productivity (Yadav & Dabhade, 2013). Performance appraisal systems and competency management frameworks are influenced by factors like organizational culture, leadership and employee participation. The design and implementation of these systems and frameworks must be done through careful planning taking into account the unique needs and characteristics of the employees and organizational culture to enhance level of employee engagement and participation. Performance appraisal systems and competency management frameworks are effective tools for improving employee performance and productivity (Sahay & Kaur, 2021).

The strength of PM is to set collaborative goals with measurable performance metrics. Goal setting should be specific and measurable to provide clarity to the employees on expected deliveries. Goal setting and performance appraisal have their respective strengths, and better integration motivates an employee to perform better (Sahai & Srivastava, 2012). Goal setting, feedback and reviews play a vital role in determining employee performance; therefore, it is imperative that all the steps are closely integrated with each other. An integrated PM system cycle results in setting clear expectation, high performance delivery and high work productivity, thus creating a high-performance culture (Pulakos, Mueller-Hanson, O'Leary,

& Meyrowitz, 2012). High performance work practices create positive work environment that fosters employee satisfaction, productivity, and retention (Sharma & Sharma, 2021).

Digitalization in HR is imperative for future workforce. Digital HRM practices are immensely valuable in enhancing employee motivation and performance to improve overall organizational performance. Organizations can improve employee motivation by providing digital HRM tools like online training and development programs, PM systems, and online communication platforms (Al-kharabsheh, Attiany, Alshawabkeh, Hamadneh, & Alshurideh, 2023). Digital performance, competence, and motivation are crucial factors in enhancing employee performance and productivity in digital era. Organisations must provide employees with the necessary digital tools and resources to improve their performance, simultaneously, investing in their competence to enhance motivation (Kurniasih, Setyoko, & Saputra, 2022). Organizations that adopt technologies are better able to adapt to the challenges of the during tough business scenarios and maintain high performance. COVID-19 outbreak had a negative impact on employee performance due to disruptions in work routines, increased workloads, and other stressors associated with the pandemic, however, Industry 4.0 base technologies, such as automation, artificial intelligence, and big data analytics, can help mitigate the negative impact of the pandemic on employee performance. Technology adoption facilitates an organisation in promoting organizational resilience and employee well-being during times of crisis (Narayanamurthy & Tortorella, 2021). An empirical study found a positive correlation between business intelligence effectiveness and corporate PM, suggesting that effective business intelligence can improve PM in organizations (Richards, Yeoh, & Popovič, 2019).

Organizations are adopting digital technologies to enhance their PM practices, with the aim of improving employee engagement, productivity, and performance. Digital shift is also driving changes in the role of HR professionals, who are increasingly seen as strategic partners and coaches. Digital shift presents both opportunities and challenges for organizations, as they need to balance the benefits of digital technologies with the need to maintain human connection and avoid the pitfalls of data overload and automation bias. It is important to involve employees in the design and implementation of digital tools, provide training to ensure that PM practices align with the organization's culture and values (Schrage, Kiron, Hancock, & Breschi, 2019). Employees who perceive performance appraisal as fair and accurate are more likely to engage in innovative behaviour, such as generating new ideas, experimenting with new approaches, and adopting new technologies. Performance appraisal can be a powerful tool for promoting innovation, but only if it is perceived as relevant and effective by employees and if it is embedded in a culture that values creativity and experimentation. However, digital era requires a shift in performance appraisal practices, with a greater emphasis on feedback, collaboration, and continuous learning (Curzi, Fabbri, Scapolan, & Boscolo, 2019).

Coaching and effective rewards leads to improved job satisfaction, which are important motivators for employees to perform well to improve overall organizational outcomes (Sidhu & Nizam, 2020). PM framework is a process-oriented approach for employee appraisals and rewards, which emphasizes the processes that employees engage in to achieve their goals. The framework emphasises on defining the process, measuring the process, providing feedback and rewarding the process for better long-term outcomes for both employees and organizations (Shafagatova & Looy, 2021).

## *2. ER*

Rewards significantly increases performance, organisational commitment and motivates an employee to perform better (Rizal, Idrus, Djumahir, & Mintarti, 2014). Employee Rewards such as pay, bonus and benefits have a strong impact on performance and stimulate employees to stay with the company. Employees who stay for a longer duration with the company tend to have stronger tacit knowledge, which strengthens the problem-solving ability of the organisation (Edirisooriya, 2014). Effective rewards systems and job satisfaction are critical factors in promoting employee performance and retention, highlighting the importance of effective human resource management practices in organizations (Tănăsescu & Leon, 2019). Organizations should focus on providing recognition and rewards to their employees to enhance their job performance, while also reducing job stress. Additionally, they should also work towards building a supportive organizational culture that can reduce job stress on job performance (Hussain, Khaliq, Nisar, Kamboh, & Ali, 2019).

ER facilitates talent retention, transparency and objectivity in the reward process to identify and recognise high performing employees (Sahai & Ciby, 2021). Performance related pay (PRP) is a tool to improve productivity and accountability amongst employees (Hasnain, Manning, & Pierskalla, 2012). It is important to have effective coordination and communication to successfully implementing performance-based pay policies, particularly in large and complex organizations to promote employee performance and organizational effectiveness (Eriksson, Larsson, & Adolfsson, 2019). Employees who value rewards, tend to perform better than other employees who do not value the rewards. Organisations must explicitly explain the rewards associated with high performance and consistently give rewards commensurate to employee performance. Companies must include compensation components that answer to employees' needs in their rewards package like variable pay, where an employee perceives a strong relationship between their performance and the rewards they receive. Such reward components have a direct correlation with employee motivation (Resurreccion, 2012). ER are combinations of monetary and non-monetary rewards, which form a key determinant to retain employees (Mabaso & Dlamini, 2018). Missing links between performance and rewards disengages an employee, which impacts their work productivity and ultimately prompts them to leave the organisation. Remuneration, promotion and recognition have a strong inter-relationship, which form a comprehensive reward system to retain talent (Amadi, Zeb-Obipi, Lebura, & Poi, 2021).

ER are directly proportionate to work motivation. Employees aim for better pay, good compensation and a generous benefits plan during their employment to strive for a good standard of living. Good compensation is pivotal in retaining the workforce. The retention program will succeed only if the organisation is committed towards a good reward strategy and becomes a market leader or is at least at par with the competition in their salary levels (Hassan & Govindhasamy, 2020). The retention strategy starts with defined goals, stringent performance reviews and its correlation with rewards. Its purpose is to create a good reward policy aimed at securing talent from the lure of the market to achieve set organisational goals and objectives, thereby achieving success (Amadi, Zeb-Obipi, Lebura, & Poi, 2021). The ER strategy needs to be linked with the Human Resources strategy as it is a performance motivator and facilitates talent retention. The reward strategy should be uniquely designed to achieve a sustainable competitive advantage and be closely linked with business strategy. Higher rewards motivate talent towards high performance, which increases the likelihood of

them staying with the organisation and eventually helps the organisation to achieve its goals (Edirisooriya, 2014).

### *3. IR*

Employees value IR within their organisation. Employees value respect, appreciation, a flexible work environment and participative management; in return, they are more committed, motivated, loyal and satisfied in their jobs (Danish, Khan, Shahid, Raza, & Humayon, 2015). Employees who are motivated exhibit a high need for achievement, affiliation and power. Thus, they are committed towards organisation goals and perform better (Rizal, Idrus, Djumahir, & Mintarti, 2014). Talented employees value pride in an organisation, manager support, PM and social responsibility, which leads to three major outcomes: career success, satisfaction and intention to stay (Tymon Jr, Stumpf, & Doh, 2010). When employees are satisfied, they feel a sense of fulfilment, achievement and joy in their respective jobs, which constitute positive factors like employee productivity and creativity that lead to organisational profitability. Job satisfaction boosts employee commitment, which is essential for competitive advantage through human capital (Resurreccion, 2012). IR, such as recognition and job autonomy, are more important for job satisfaction than ER, such as salary and benefits (Tănăsescu & Leon, 2019).

IR reflect an employee's psychological mindset when they perform their jobs and exhibit a degree of engagement towards organisational goals. Lack of employee involvement, low motivation and unclear organisational vision denotes low employee engagement (Kumar P. , 2019). Organisations with a high focus on IR reflect that employees are motivated, loyal and satisfied in their jobs and they strive to perform better (Danish, Khan, Shahid, Raza, & Humayon, 2015). Rewards have significant positive impact on organisational commitment. Organisational commitment is a bond between an employee and the organisation, a psychosomatic state that attaches an employee with the organisation. Organisational commitment is a psychological attachment with the organisation that goes beyond loyalty, and the employee is willing to engage their skills and talents to contribute towards the organisation's objectives (Mabaso & Dlamini, 2018). Organisational commitment is indicated by an organisation's effectiveness in achieving its goals, efficiency in utilising the resources optimally, employee satisfaction, customer delight, product innovation, product quality, serviceability mindset and ability to remain 'human' (Kumar P. , 2019). Successful companies define employee value proposition to understand employees' desires, create high levels of engagement and empower organisational commitment.

### *4. CP*

Career progression is part of the employee development programme to help them grow and reflects that their organisation is partnering in their growth and development. An organisation's commitment towards career growth influences employee retention (Sinha & Sinha, 2012). A strong career development model has primarily three ingredients: knowledge, competence and experience. Great organisations develop employees on current and future concepts, sharpen their skills to perform better and provide challenging roles for a wider understanding of complex tasks (Sharda, 2012). Professionals want to know that the company has charted a strong career progression path for them. Employees plan their career if organisations continuously communicate career opportunities, future career path and assign cutting-edge projects to keep them engaged. Employees cherish challenging situations because along with challenge comes learning, authority and autonomy (Kumar, Morthati, &

Jahangir, 2014). Organisations frequently struggle to chart out a career progression plan for their top talent and thus struggle to retain them. Companies go out into the market to hire top talent from competition due to a talent shortage and get unexpected effects of cultural misalignment.

## *5. LO*

Continuous learning plays an important role in career growth and thus keeps talent engaged with the organisation. However, consistent focus on onboarding, training, learning and development in the early stages of an employee's career facilitates high performance within the organisation and leads to employee engagement (Sahai & Srivastava, 2012). 'Buddy' programmes focusing on onboarding, annual talent reviews to assess and develop talent, business leadership development programmes to understand business concepts, action-learning programmes to undertake live projects for on-the-job learning and networking opportunities all facilitate an employee to develop skills and competencies for the future (Sharda, 2012).

Competency assessment programmes are key in identifying competency gaps, which are addressed through swiftly crafted senior and young leadership development programmes to develop, retain, and create a robust talent pipeline in the organisation. Such development programmes create high self-esteem, rejuvenate employees and act as a recognition, which builds their commitment towards the organisation (Rana, Goel, & Rastogi, 2013). An organisation needs to attract, retain, and nurture those employees who foster a sense of purpose, develop unique strategies, are able to attract other committed people and have an ability to innovate and view the work environment as a continual learning structure. Learning is becoming extremely important for organisations that operate in a complex dynamic business environment that encourages disruptive technologies and changes the marketplace (Bihani & Dalal, 2014). A meta-study synthesizes the findings of several studies on the holistic ecological approach to talent development, which highlighted the importance of factors that influence talent development, such as social, cultural and environmental factors (Feddersen, et al., 2021).

Organisations drive learning and development programmes to develop behaviours, skills and competencies, which are essential requirements for talent development. However, many companies drive learning initiatives as an event rather than a process due to the absence of a comprehensive competency framework. It distinguishes between core competencies and distinctive competencies, which are an organisation's strategic strength. Core competencies are those where the organisation does exceedingly well whereas distinctive competencies are core competencies where the company is superior to its competitors (Bani-Hani, 2021).

A well-defined comprehensive competency framework is a collection of knowledge, skills, abilities, and other characteristics that are required to perform a particular job. The competency framework is used in selection, career development, leadership development and organisational change. It provides a strategic direction to the company by defining core competencies required to perform a job; thus, organisations can articulate unidirectional developmental plans based on individual and organisational needs (Strong, et al., 2020). Competency-based learning results in successful performance delivery at all levels and acts as a competitive advantage for the company. Organisations should design an explicit and comprehensive competency framework to develop employees on business-related competencies. The major advantage in developing business-related competencies is that

employees develop consistently on defined competencies, resulting in nurturing tailor-made talent to strengthen the organisation's talent pipeline.

***TE***

Talent is a combination of competence, commitment and contribution. Successful organisations exhibit their commitment towards the talent process by charting out a career progression path for an employee right from the hiring stage in order to develop and retain them (Sadek, 2020). Successful organisations have a clear-cut career progression strategy to design and monitor talent development plans: assign challenging, interesting and meaningful roles; provide clear advancement opportunities; and implement a talent rewards strategy (Aguinis, Gottfredson, & Joo, 2012). TM and employee retention practices are critical for organizational success and organizations must adopt a strategic approach to manage talent and retain employees. These are influenced by factors like leadership, organizational culture, employee engagement, compensation and benefits, training and development, and work-life balance. Organizations having strong leadership, supportive organizational culture, engaged employees, and offered attractive compensation and benefits packages are more likely to implement effective TM and employee retention practices. Therefore, organizations should develop a comprehensive TM and employee retention strategy that aligns with their organizational goals and objectives (Pandey & Kaur, 2021).

TM practices, such as recruitment, selection, training and development, PM, and career development, impact positively on organizational outcomes such as employee retention, productivity, and innovation. Thus, it is important to align TM practices with organizational strategy and culture (Rout & Satpathy, 2020). Change management and TM are closely related to each other, and the success of TM initiatives depend on effective change management. Organizations that have strong leadership, supportive organizational culture, effective communication, and engaged employees are more likely to implement successful change management initiatives and TM strategies. Organizations that implement change management initiatives successfully are more likely to attract, develop, and retain top talent (Roy, 2019).

Machine learning-based approach outperforms traditional methods of talent valuation, such as subjective assessments by managers or HR professionals. Organisations should leverage data analytics and AI to make more informed decisions about TM, such as identifying high-potential employees or designing more effective career development programs (Loyarte-López & García-Olaizola, 2022). Innovative digital practices, such as social media recruiting, gamification, virtual reality-based training, and big data analytics for talent acquisition and management are important to improve efficiency, reduce cost, increase employee engagement and retention. Organizations should adopt innovative TM practices to stay competitive and attract and retain talented employees in the digital age (Trigunait & Taruna, 2020).

TM in manufacturing organizations are more traditional and are limited to training and development. Manufacturing organisations must adopt more advanced TM strategies to attract, retain, and develop their workforce to remain competitive in global market (Rostam, 2019). TM practices such as talent acquisition, development, retention, and succession planning are critical for organisations to enhance their performance and remain competitive. Organisations must adopt effective TM practices to remain competitive in today's global economy (Mathe, 2016). The 21st century has intensified the talent war as the world has become a global village, and almost all competitors have access to similar resources except

human capital. The organisational commitment towards shaping a career path for talented employees results in creating brand ambassadors and organisational advocates. Employees look up to them as their role models and follow in their footsteps, thus staying committed for longer.

## Research Methodology

Research discovers knowledge on a specific subject to explore an idea, dissect a problem, make a strong argument and go beyond one's own feelings, experiences, opinions and thoughts (Clarke, 2005). Research is undertaken to determine a strong compelling reason to explain the impact of change in an existing process, explore new problem areas and confirm existing knowledge on current issues. The 'research onion' is one of the most popular and widely used research models for business and management studies (Saunders, Lewis, & Thornhill, 2019).

Research methodology is based on understanding developed during the class, discussions with fellow researchers and by reading educative material. PRT has been evolving for the last two decades and has a transformational history; therefore, the papers are deliberately chosen after 2010. The literature review helped to identify gaps and limitations and resulted in categorising five independent variables and their impact on the TE to engage talent, as shown in the figure below. Companies devote too much time to attract talent from the market but spend too little time in developing and retaining talent, which has a high influence on creating a conducive TE. Developing a conducive TE is a business strategy rather than an activity of the Human Resource Department, and line managers should take responsibility to develop the skills of their team (Mathe, 2016).

## Research Framework

The research methodology facilitates the design of a systematic and structured research framework to answer the research questions. The research framework comprises five independent variables with a focus on establishing a relationship between the constructs. This has been broken down into problem statements, objectives and outcomes. The interlinkages and correlations are shown below:

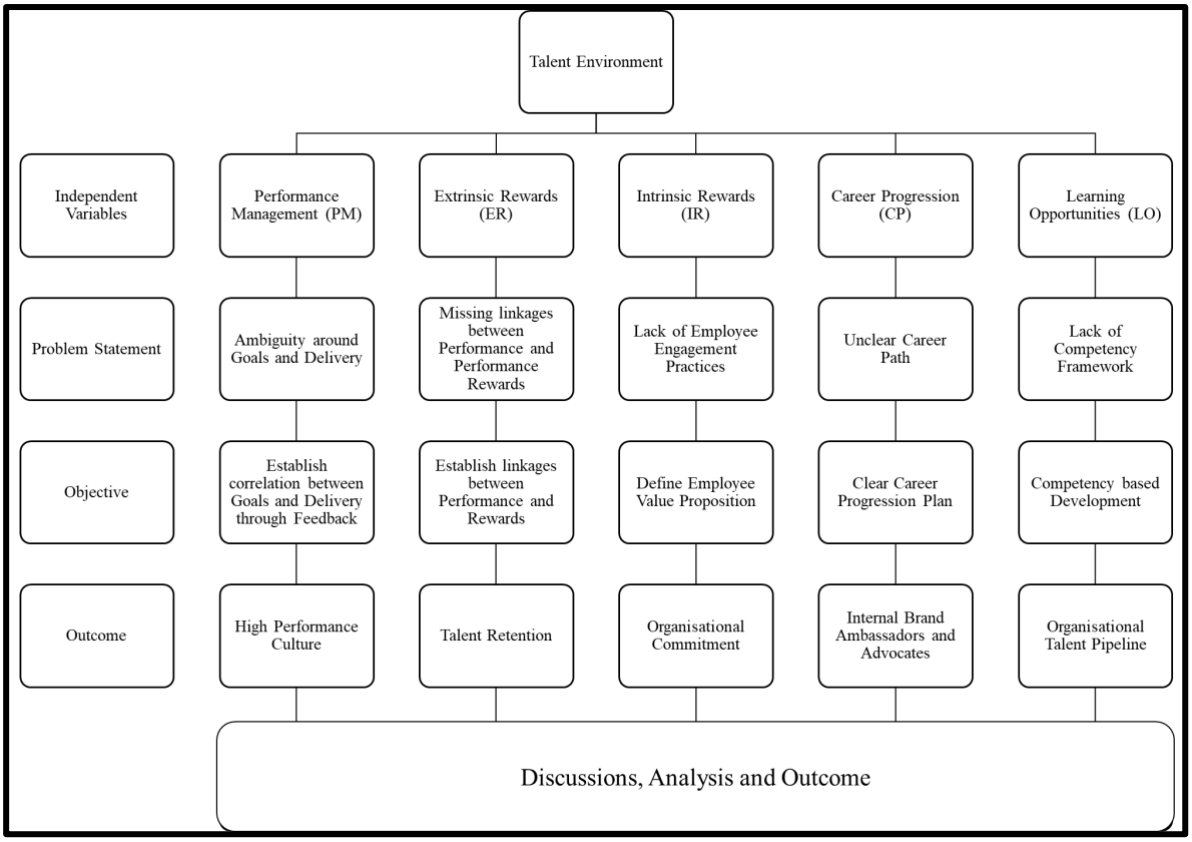



***Figure 2: Talent Environment – Discussions, Analysis and Outcomes***

## Discussions, Analysis and Outcomes

### *1. PM*

The ambiguity around the PM system is continuous when it comes to linking goals with performance measures. Organizations need to focus on establishing the correlation between goals and expected performance deliverables from an employee, which can be strengthened through effective and continuous feedback system. When an employee receives continuous feedback, mentoring and counselling, it improves overall work productivity (Yadav & Dabhade, 2013). Managers define, facilitate and encourage performance to meet individual goals and strategic organizational objectives (Cascio, 2012).

*Outcome*: The strength of PM is to set collaborative goals with measurable performance metrics. Goal setting should be specific and measurable to provide clarity to the employees on expected deliveries. Goal setting and performance appraisal have their respective strengths, and better integration motivates an employee to perform better (Sahai & Srivastava, 2012).

*Proposition*: Goal setting, feedback and reviews play a vital role in determining employee performance; therefore, it is imperative that all the steps are closely integrated with each other. An integrated PM system cycle results in setting clear expectation, high performance delivery and high work productivity, thus creating a high-performance culture (Pulakos, Mueller-Hanson, O'Leary, & Meyrowitz, 2012).

### *2. ER*

ER are combinations of monetary and non-monetary rewards, which form a key determinant to retain employees (Mabaso & Dlamini, 2018). Missing links between performance and rewards disengages an employee, which impacts their work productivity and ultimately prompts them to leave the organization. Remuneration, promotion and recognition have a strong inter-relationship, which form a comprehensive reward system to retain talent (Amadi, Zeb-Obipi, Lebura, & Poi, 2021).

*Outcome*: ER are directly proportionate to work motivation. Employees aim for better pay, good compensation and a generous benefits plan during their employment to strive for a good standard of living. Good compensation is pivotal in retaining the workforce. The retention program will succeed only if the organization is committed towards a good reward strategy and becomes a market leader or is at least at par with the competition in their salary levels (Hassan & Govindhasamy, 2020). The retention strategy starts with defined goals, stringent performance reviews and its correlation with rewards. Its purpose is to create a good reward policy aimed at securing talent from the lure of the market to achieve set organizational goals and objectives, thereby achieving success.

*Proposition*: The ER strategy needs to be linked with the Human Resources strategy as it is a performance motivator and facilitates talent retention. The reward strategy should be uniquely designed to achieve a sustainable competitive advantage and be closely linked with business strategy. Higher rewards motivate talent towards high performance, which increases the likelihood of them staying with the organization and eventually helps the organization to achieve its goals (Edirisooriya, 2014).

### *3. IR*

IR reflect an employee's psychological mindset when they perform their jobs and exhibit a degree of engagement towards organizational goals. Lack of employee involvement, low motivation and unclear organizational vision denotes low employee engagement (Kumar P., 2019). Organizations with a high focus on IR reflect that employees are motivated, loyal and satisfied in their jobs and they strive to perform better (Danish, Khan, Shahid, Raza, & Humayon, 2015).

*Outcome*: Rewards have significant positive impact on organizational commitment. Organizational commitment is a bond between an employee and the organization, a psychosomatic state that attaches an employee with the organization. Organizational commitment is a psychological attachment with the organization that goes beyond loyalty, and the employee is willing to engage their skills and talents to contribute towards the organization's objectives (Mabaso & Dlamini, 2018).

*Proposition*: Organizational commitment is indicated by an organization's effectiveness in achieving its goals, efficiency in utilising the resources optimally, employee satisfaction, customer delight, product innovation, product quality, serviceability mindset and ability to remain 'human' (Kumar P., 2019). Successful companies define employee value proposition to understand employees' desires, create high levels of engagement and empower organizational commitment.

### *4. CP*

Organizations frequently struggle to chart out a career progression plan for their top talent and thus struggle to retain them. Companies go out into the market to hire top talent from competition due to a talent shortage and get unexpected effects of cultural misalignment. Talent is a combination of competence, commitment and contribution. Successful organizations exhibit their commitment towards the talent process by charting out a career progression path for an employee right from the hiring stage in order to develop and retain them (Sadek, 2020).

*Outcome*: Successful organizations have a clear-cut career progression strategy to design and monitor talent development plans: assign challenging, interesting and meaningful roles; provide clear advancement opportunities; and implement a talent rewards strategy (Aguinis, Gottfredson, & Joo, 2012).

*Proposition*: The 21st century has intensified the talent war as the world has become a global village, and almost all competitors have access to similar resources except human capital. The organizational commitment towards shaping a career path for talented employees results in creating brand ambassadors and organizational advocates. Employees look up to them as their role models and follow in their footsteps, thus staying committed for longer.

### *5. LO*

Organizations drive learning and development programmes to develop behaviours, skills and competencies, which are essential requirements for talent development. However, many companies drive learning initiatives as an event rather than a process due to the absence of a comprehensive competency framework. It distinguishes between core competencies and distinctive competencies, which are an organization's strategic strength. Core competencies are those where the organization does exceedingly well whereas distinctive competencies are core competencies where the company is superior to its competitors (Bani-Hani, 2021).

*Outcome*: A well-defined comprehensive competency framework is a collection of knowledge, skills, abilities and other characteristics that are required to perform a particular job. The competency framework is used in selection, career development, leadership development and organizational change. It provides a strategic direction to the company by defining core competencies required to perform a job; thus, organizations can articulate unidirectional developmental plans based on individual and organizational needs (Strong, et al., 2020). Competency-based learning results in successful performance delivery at all levels and acts as a competitive advantage for the company.

*Proposition*: Organizations should design an explicit and comprehensive competency framework to develop employees on business-related competencies. The major advantage in developing business-related competencies is that employees develop consistently on defined competencies, resulting in nurturing tailor-made talent to strengthen the organization’s talent pipeline.

## Limitations and Future Scope of Research

This research has two fundamental constraints. First, the study is a qualitative in nature and inferences have been made by closely dissecting relevant research papers focussing on

variables impacting TE. Second, the research scope is widespread and should be narrowed down to a specific geography and sector.

PRT has significant potential to help in establishing the performance–reward correlation that impacts TE. It has been observed by reviewing the literature that most of the studies have focussed on one or two factors of PRT. The existing study strongly suggests that there is a high correlation between performance, rewards and talent, and TE is influenced by the way employee's PM, rewards, career and learning are managed by an organization. Future studies have scope to devise a PRT model that facilitates organizations to drive performance rewards to influence TE to achieve organizational goals, thus creating a strong performance-driven culture in the organization.

## Conclusion

Separate and isolated studies have been conducted on strategic people management subjects like PM, rewards and TM; however, it has been established through the literature review that studies have limited or no correlation between all the subjects. It has been observed that there is a strong need to devise a holistic conceptual model, through a systematic and structured study, to establish correlation between performance, rewards, career and learning impacting TE in the business scenario. The study shall benefit management practitioners and the company's policy makers while drafting and driving a TM framework in their organization. The study signifies that PM, rewards, career path and learning are extremely important for to create a conducive TE within an organization. It determines that talented employees are encouraged by the way their career journey is planned, managed and rewarded by the organization.

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# *Prevalence of Adjustment Disorder Among Employees of Middle-Level Management in the Apparel Sector in Sri Lanka*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
Adjustment Disorder (AjD) is a transient psychological disorder that develops as a result of facing stressful life events. At present, the Diagnostic and Statistical Manual of Mental Disorders- 5th Edition (DSM-5) and the International Classification of Diseases - 11th Revision (ICD-11) are the two widely recognized diagnostic criteria. The Adjustment Disorder New Module 20 (ADNM-20), a self-reported questionnaire, is universally accepted as an effective screening tool for AjD and is widely being used. The objective of the study was to identify the prevalence rate of AjD among middle-level employees of the apparel sector in Sri Lanka. The current study followed a quantitative research design. Three hundred employees were screened for AjD symptoms using the DSM-5 criteria and ADNM-20 questionnaire. The results revealed a high prevalence rate of 56.33%. In addition, among the six subscales of ADNM-20, the avoidance subscale emerged with the highest mean score. Furthermore, it demonstrated that divorced female employees, employees within the 36-45-year age category, and employees working in the Human Resources (HR) and Industrial Engineering (IE) departments presented severe symptoms of AjD. The overall findings highlighted the urgent need for extensive future research on AjD, not only within the apparel sector but across all industries and work settings.

Keywords: Adjustment Disorder, ADNM-20, Apparel Sector

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## I. Introduction

Adjustment Disorder (AjD) involves a maladaptive emotional and/or behavioural response to a specific psychosocial stressor at a level that is disproportionate to the severity of the stressor. (O'Donnell et al., 2019). As seen in other stress-related disorders, DSM-5 diagnostic criteria for AjD particularly recognise guidelines to decide what type of events or circumstances could be considered as stressors, or in relation to identifying the severity or nature of the stressor. Likewise, past research stipulates those stressors can include traumatic events or decisive life changes following a traumatic event such as an unexpected death of a loved one, and other stressful critical events such as an acute illness or unemployment (Einsle et al., 2010).

Prevalence rates of AjD vary markedly due to various factors, including sampling process, population, and the diversity of measures used for assessment and diagnosis. Population-based studies have found prevalence rates of less than 1% among five European countries, and this low proportion may be due to limitations of the diagnostic tools used (Gradus, 2017). However, a recent study conducted using a diagnostic concept found the prevalence rate of AjD at 2% and 76% of those with AjD were female, suggesting women are at a higher risk of developing AjD (Glaesmer et al., 2015).

Notably, the highest prevalence rate for DSM-III-defined psychological stress was 42%, which was documented among Japanese breast cancer patients (Okamura et al., 2000). Likewise, AjD was the most prevalent disorder among individuals presenting with self-harm during routine psychiatric assessment in emergency department settings (Taggart et al., 2006). In addition, a prevalence rate of 15-19% was observed in oncology-related palliative and non-palliative care settings (Mitchell et al., 2011). Furthermore, it was found that AjD accounted for 18.5% of consultation-liaison referrals in Irish general hospitals, whereas a psychosocial stressor was found in 93% of referrals, and this included medical illness in 59% of patients (O'Donnell et al., 2019). Other consultant psychiatry liaison samples have reported AjD at a prevalence rate of 30%. Additionally, AjD was diagnosed at a rate of 12% in psychiatric consultations in psychiatry services in the United States, Canada, and Australia (Strain et al., 1998).

However, apart from consultation liaison settings, research on the prevalence of AjD in other public or private sectors of society is minimal. No research has been done to assess the prevalence of AjD in the apparel sector in Sri Lanka or across the world. One key factor for the lack of research could be the absence of clearly defined and specific symptom criteria through which AjD can be differentiated from other stress-related disorders such as major depression (Bachem & Casey, 2018). AjD is seen to be too broad to be clinically relevant, as it overlaps with other distress disorders. This would restrict the validity and growth of research in the area of AjD.

At the present moment, the process of conceptualising AjD as a separate and distinct disorder is in a state of transition, and with the recent revisions of the two main diagnostic manuals (DSM-5 and ICD-11), AjD-related research has seen a growing interest not only in consultation settings but also in other areas and among specified groups of individuals.

### *A. The Diagnosis of AjD*

AjD is currently diagnosed using two frameworks: the Diagnostic and Statistical Manual of Mental Disorders, text revision of the Fifth edition of DSM-5 (DSM-5-TR) published by the American Psychiatric Association in 2022, and the eleventh edition of the International Classification of Diseases (ICD-11) (World Health Organisation, 2018).

The DSM criteria for the diagnosis of AjD have expanded over the years. Initially, in DSM-I and DSM-II, AjD was described merely as a "transient situational personality disorder" (DSM-I) and "transient situational disturbances' (DSM-II) respectively. The introduction of the term "Adjustment Disorder" was documented under DSM-III while DSM-IV catered to the development of symptoms related to AjD. The present classification, DSM-5 consists of a five-point criterion for the diagnosis of AjD. It demonstrates that an individual who develops emotional and behavioural symptoms which are disproportionate to the severity of an identifiable stressor(s) and/or presents with significant impairment in social, occupational, or other areas of functioning within three (03) months of exposure to the stressor, can be diagnosed as suffering from AjD.

In addition, the criterion stipulates that the symptoms should not fulfill the diagnostic criterion of another disorder under the DSM classification nor be an aggravated pre-existing psychological disorder whereas it further emphasizes that the symptoms should not exist for more than six (06) additional months after the stressor has diminished. Along with the diagnostic criteria, DSM-5 also includes several subtypes of AjD: subtype-1) AjD with depressive symptoms, subtype-2) AjD with anxious symptoms, subtype-3) AjD with a mix of both depressive and anxious symptoms, subtype-4) AjD with disturbances of conduct and subtype-5) AjD with disturbances of conduct and emotions.

On the other hand, the ICD-11 introduced changes that marked a significant paradigm shift. In line with the DSM, the ICD recognises AjD as a stress-related disorder; however, with a different classification. Accordingly, an individual is required to experience at least one or more identifiable stressors to be diagnosed with AjD under ICD-11 provided that he or she does not meet the criterion of another clinical diagnosis. The symptoms are classified into two categories: category-1) preoccupation, which involves excessive worry, distressing thoughts, and rumination related to the current stressor, and category-2) failure to adapt, which includes significant impairment in social, family, and occupational aspects of life (Zelviene, Kazlauskas, & Maercker, 2020). Additionally, higher loneliness and lower self-efficacy were related to higher AjD symptom severity. In addition, ICD-11 recognises that symptoms tend to diminish within six (06) months unless the stressor prevails for a longer period. Despite AjD being addressed under two widely recognised diagnostic classifications; DSM-5 and ICD-11, one could argue that many terms related to symptoms such as 'excessive' and 'disproportionate' lack a specific definition thus, leading to problems in administering the AjD diagnosis. Despite the frequent use of AjD in clinical practice, it has been studied in research fairly recently. Furthermore, it can be suggested that the absence of a clear and distinctive diagnostic criterion according to the ICD-11 and DSM-5 might have hindered the development of adequate assessment tools to screen AjD.

Recently, specific instruments to measure AjD have begun to emerge, and the ADNM-20 is the most widely recognised tool and is available as a structured clinical interview (Maercker, Einsle & Köllner, 2007) or self-report questionnaire (Einsle et al., 2010) which includes two (02) sections. Under the first section, the participants are required to select acute and chronic

life stressors presented over the past month and identify the most distressing one among the selected options. The second section consists of twenty (20) items which are categorised to form six (06) subscales: preoccupation, failure to adapt, avoidance, depressive mood, anxiety, and impulse disturbance. Each item is rated on a 4-point Likert scale on the severity of the experience during the past two (02) weeks whereas the total sum of all item responses elicits the overall severity of AjD symptoms. Several successful attempts have been made in the past to validate this questionnaire with studies demonstrating significant levels of specificity and sensitivity, creating specific diagnostic criteria for AjD (Bachem et al., 2017) (Lorenz, Bachem & Maercker, 2016). In addition, despite fewer items, the more condensed forms of ADNM-20, such as the ADNM-8 and ADNM-4 have also shown high levels of convergent and construct validity which proves that these instruments too can be utilised effectively to screen for AjD or other stress-related symptoms (Ben-Ezra et al., 2018). However, several validation studies were conducted showing stronger psychometric properties for the longer versions of the ADNM questionnaires.

### *B. The Prevalence of AjD in the Apparel Sector in Sri Lanka*

The context of the present study is the apparel industry in Sri Lanka which has generated a high unemployment rate at 4% in 2016 and is home to the highest departures toward foreign employment (Welmilla, 2020). However, according to MAS Fabric Park (2018), around 15% of Sri Lanka's workforce is employed within the apparel industry (Lakshani & Weerasinghe, 2020), including a workforce of over 300,000 individuals, with a majority of female workers (Daily FT, 2019).

When considering the export income, Sri Lanka's garment sector accounted for 40% of total exports in 2017, generating 5.3 billion US$ from export trade in 2019, increasing at 5.1% annually, according to reports by the Joint Apparel Association Forum (The Financial Express, 2020). For the year 2019, the sector's export income was calculated to be US$ 4.2 billion, representing a 39.6% increase over the previous year and the year-over-year increase in exports in 2019 was 24% (Central Bank Annual Report, 2019). Notably, apparel exports in June 2022 had reached an all-time high, at a figure of US$ 537 million monthly (Daily FT, 2022) despite numerous challenges resulting from the Covid pandemic and ongoing economic crisis.

However, the apparel sector, despite being a high-calibre business, in terms of its foreign income generation platform, has its drawbacks of which the most notable would be the additional responsibilities that the employees have undertaken to keep up with the demands of the industry. Particularly, one could state that the employees in middle-level roles who are responsible for the production and quality assurance of the industry, are subject to the most stressful conditions. As a result of the inability to cope with work-related stress, creates a degree of employee vulnerability toward developing an array of stress-related disorders, out of which depression and anxiety are the two most widely known and studied in the Sri Lankan context. Hence, AjD in the Sri Lankan context is relatively unknown, and it seems to go unnoticed, hindering individuals from seeking the help they need to overcome this disorder. Therefore, the aim of this paper is to identify the prevalence rate of AjD among middle-level employees in the apparel sector in Sri Lanka. This research would be a precursor to other studies, both locally and globally, to focus on the prevalence of this disorder among the apparel sector employees of middle-level management.

## II. Methodology

### *Study Design*

The present research is a descriptive cross-sectional study and is one component of a bigger study with several other components.

### *Study Setting*

The study was conducted in eight (08) selected apparel sector organisations situated in six (06) different industrial zones; Katunayake, Kaduwela, Buttala, Baddegama, Pinnaduwa, and Koggala and managed by one administrative body. This is one of the leading private-sector apparel manufacturers in Sri Lanka.

### *Sample/Participants*

The sample included employees from the middle-level management from eight (08) different factories of the organisation comprising approximately three hundred (300) employees; Baddegama - 38, Kaduwela - 38, Katunayaka-STAR - 38, Koggala-01 - 38, Katunayaka LLI - 37, Pinnaduwa - 37, Koggala-02 - 37, and Buttala - 37.

The employees of the middle-level management represented different departments, including team leaders, operation executives, and managers.

The rationale behind the selection of middle-level management is that the middle layer is the most accountable for implementing plans and achieving targets. As a result, these employees are subjected to multi-dimensional and multi-faceted work challenges while balancing the pressures from both the higher and lower tiers of the organisation. In addition, middle-level employees are generally not compensated in proportion to the responsibilities they undertake nor have the liberty to resign whenever they wish which further contributes to emotional distress. Due to the above reasons, middle-level employees were regarded as the most suitable group of individuals for the study.

### *Inclusion Criteria*

All middle-level apparel sector employees were enrolled in the study irrespective of their age, gender, race, or socio-economic status, alongside other factors.

### *Exclusion Criteria*

Employees with other mental health disorders, physical disabilities, and those who were on medication for various diseases were excluded from this study. Employees with alcohol, tobacco, or drug addiction were also not included.

### *Sampling Method*

The random sampling method was used to recruit participants for the present study which allows researchers to statistically measure the true disorder prevalence in the population (Brynildsrud, 2020) with the support of the HR department.

### *Sample Size*

The sample size is three hundred (300) middle-level employees in the apparel sector industry setting.

### *Materials/ Measures*

For the data collection, the participants were screened for AjD using the DSM-5 and ADNM-20 Questionnaire.

### *The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)*

According to DSM-5, the emergence of behavioural or emotional symptoms in reaction to one or more identifiable stressors should occur not less than three (03) months after the stressors' onset (American Psychiatric Association, 2013). In addition, these stress-related symptoms should not be another indicator of a mental illness, and they should not last longer than six (06) months after the stressor has terminated.

Past studies have demonstrated that DSM-5 depicts a higher internal consistency with a Cronbach Alpha value of more than 0.90 (Patra & Sarkar, 2013). This criterion is universally recognised as the core diagnostic manual for psychological disorders and thus, was incorporated to screen participants for AjD in the present study.

### *Adjustment Disorder - New Module 20 Questionnaire (ADNM - 20)*

The ADNM is a measure of AjD that is composed of two sections: the item list and the stressor list. The most distressing events that a person may have had in the last two years are included in the stressor list, and the final section of the questionnaire asks about how frequently a person experienced AjD symptoms during the previous two weeks using a Likert scale. This Likert scale has four rating points, where one represents "Never" and four represents "Often." The ADNM-20 is composed of subscales that include avoidance, sad mood, anxiety, impulse disturbance, obsession, and failure to adapt (Lorenz et al., 2016). Preoccupation and failure to adjust are the items under the subscales that are thought to be the main symptoms of AjD; the total score of the items determines how severe the symptoms are (Lorenz et al., 2016).

Similar to DSM-5, past studies reveal a high internal consistency with a Cronbach Alpha value of 0.94 (Lorenz et al., 2016), whereas the Chinese version of the questionnaire reported a higher internal consistency with a Cronbach Alpha value of 0.93 (Tang et al., 2020). To utilise the questionnaire, it was validated in the Sri Lankan context as a part of the study.

### *Adaptation of ADNM-20 to the Sri Lankan Context*

1. The translation, validation, and adaptation process were done following the recommended translation and adaptation procedure for health instruments, compiled by the World Health Organisation (World Health Organisation, 2010).
2. Considering this guideline, all documents followed the procedure of forward translation, expert-panel back translation, pre-testing, and cognitive interviewing and then the final version was documented.

3. Thereafter, the translated document was sent to three experts in the field of mental health for expert panel review.
4. Written permission was also obtained from the authors of the ADNM-20 questionnaire.
5. Once all the experts attested to the translations as accepted, a pilot study was conducted with thirty (30) participants.
6. Subsequently, the ADNM-20 questionnaire, according to the Sri Lankan context, was finalised based on the feedback obtained from the pilot study, and the finalised questionnaire was utilised for the present study.

### *Data Collection Procedure*

A batch of volunteer, trained counsellors who presented themselves for the administration of a tool in a PhD study, administered the screening procedure for AjD using the DSM-5 guidelines and the ADNM-20 self-report questionnaire.

### *Ethical Considerations*

The General Sir John Kotelawela Defence University (KDU) Ethics Review Committee in Sri Lanka granted ethical approval for the study. Written informed consents were taken from all employees before participation. Their participation in the study was completely voluntary, and their right to choose whether to participate or depart was adequately recognised.

They had the liberty to withdraw from the study at any time, without assigning a reason, and doing so had no negative effects on their career or tenure. The data was kept in a password-protected computer. All data was stored anonymously whereas the confidentiality of the participants and their information was guaranteed. A special identification code was added to the completed questionnaires to completely anonymise them. However, they were provided adequate information and guidance about the study. Furthermore, they were provided an opportunity to approach counsellors and other specialists for support if any incidents occurred. It was assured that there was no physical or psychological harm done to the participants during this study, and if anyone did experience any emotional or psychological distress, they were given the information they needed to be referred to professionals who could offer them psychological support.

## III. Results

Out of the three hundred (300) employees who were screened for AjD, one hundred and sixty-nine (169) individuals were diagnosed with symptoms of AjD. Based on the data, the prevalence rate was calculated as 56.33%.

Among the participants with AjD, 73 (43.2%) were males and 96 (56.8%) were females. The majority of the patients were in the 26-35 year age group (36.1%), while the least number of participants belonged to the age group of 46-55 years (10.7%). The majority of the participants were married (52.1%), while 43.8% were single and the rest were divorced (4.1%). Descriptive statistics for all sociodemographic variables are presented in Table 1.

Table 1: Sociodemographic characteristics of the sample

| Variables | Males | | Females | | Total | |
|---|---|---|---|---|---|---|
| Age group (In years) | **n** | **%** | **n** | **%** | **n** | **%** |
| 18-25 years | 19 | 26.0 | 33 | 34.4 | 52 | 30.8 |
| 26-35 years | 26 | 35.6 | 35 | 36.5 | 61 | 36.1 |
| 36-45 years | 18 | 24.7 | 20 | 20.8 | 38 | 22.5 |
| 46-55 years | 10 | 13.7 | 8 | 8.3 | 18 | 10.7 |
| Marital status | **n** | **%** | **n** | **%** | **n** | **%** |
| Divorced | 4 | 5.5 | 3 | 3.1 | 7 | 4.1 |
| Married | 44 | 60.3 | 44 | 45.8 | 88 | 52.1 |
| Single | 25 | 34.2 | 49 | 51.0 | 74 | 43.8 |
| Designation | **n** | **%** | **n** | **%** | **n** | **%** |
| HR (Human Resources) | 5 | 6.8 | 9 | 9.4 | 14 | 8.3 |
| IE (Industrial Engineering) | 6 | 8.2 | 5 | 5.2 | 11 | 6.5 |
| OT (Other) | 15 | 20.5 | 17 | 17.7 | 32 | 18.9 |
| PR (Production) | 29 | 39.7 | 44 | 45.8 | 73 | 43.2 |
| QA (Quality Assurance) | 9 | 12.3 | 17 | 17.7 | 26 | 15.4 |
| ST (Stores) | 9 | 12.3 | 4 | 4.2 | 13 | 7.7 |
| Educational level | **n** | **%** | **n** | **%** | **n** | **%** |
| GCE Ordinary Level | 19 | 26.0 | 18 | 18.8 | 37 | 21.9 |
| GCE Advanced Level/Diploma | 44 | 60.3 | 65 | 67.7 | 109 | 64.5 |
| Degree/Masters | 10 | 13.7 | 13 | 13.6 | 23 | 13.6 |

Both males and females had nearly similar mean total scores for ADNM-20, 60.93 and 61.21 respectively. The ADNM-20 sub-scale analysis revealed the highest mean scores for the ‘avoidance’ category (13.41, SD 2.15), followed by ‘preoccupations’ (12.50, SD 1.92) and ‘failure to adapt’ (11.51, SD 2.67). Both males and females had the lowest mean scores for the ‘anxiety’ sub-scale, with scores of 5.25 (SD 1.56) and 5.74 (SD 1.29).

Table 2: Distribution of mean values in the subscales of ADNM-20

| ADNM-20 sub-scale | Mean | Theoretical maximum |
|---|---|---|
| Depressed mood | 9.01 | 12 |
| Preoccupations | 12.50 | 16 |
| Avoidance | 13.41 | 16 |
| Anxiety | 5.53 | 8 |
| Impulse disturbances | 9.14 | 12 |
| Failure to adapt | 11.51 | 16 |

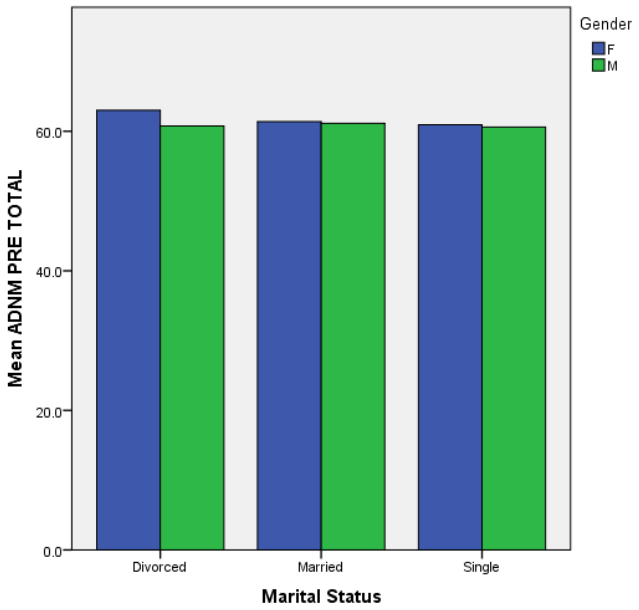



Figure 1: Mean ADNM-20 score with marital status

According to Figure 1, divorced females seem to have a slightly higher ADNM-20 mean score across categories of marital status. Both male and female participants who were single were reported to have a comparatively lower mean score for ADNM-20.

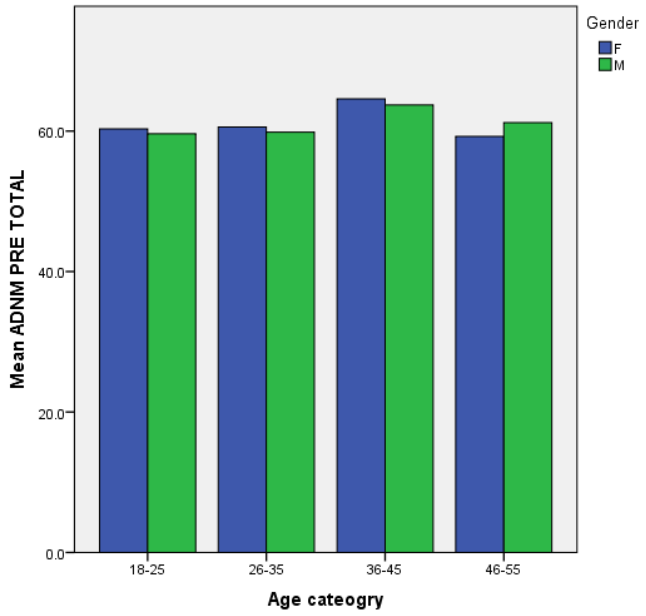



Figure 2: Mean ADNM-20 score with age

According to Figure 2, both male and female participants in the age category of 36-45 years were reported to have the highest ADNM-20 mean scores. The lowest ADNM-20 score was reported by females in the age category of 46-55 years.

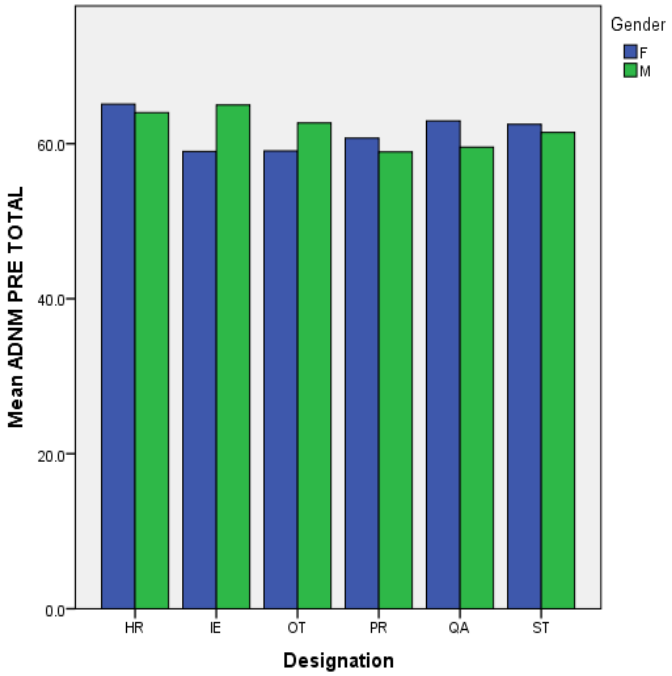



Figure 3: Mean ADNM-20 score with designation

Figure 3 shows the mean ADNM-20 scores of the participants against their designation. Accordingly, females who worked in HR and males who worked in IE were reported to have the highest mean ADNM-20 score.

## IV. Discussion

The current study aims to assess the prevalence rate of AjD among middle-level employees in the Sri Lankan apparel sector using a validated psychometric scale, ADNM-20. The results revealed that 56.33% of the considered population was diagnosed with AjD where it can be noted that the figure was considerably high. The significance of this result in the context of the apparel sector management employees is this industry continues to be a vital contributor to the economy of the nation. Employees in middle-level management in this industry face a wide range of stressors, making them more prone to suffering from signs of AjD compared to the general population.

This result can be aligned with the study by Vancappelen et al. (2021) which was carried out among the French general population during the COVID-19 pandemic and recorded a rate of 61.3%. Both these results highlight that the prevalence of AjD could be shown at higher rates even in different study samples and contexts. Similarly, the study by Makki et al. (2024) also supports these results which found a 50% prevalence rate of AjD among medical undergraduates in Saudi Arabia. However, the generalizability of the current study findings is doubtful as these results are specific to the apparel sector middle-level management employees and may not generalise to other work settings or general populations.

Contradicting the above results, according to the study conducted by Glasemer and his colleagues in 2015, the German general population carries 2% of individuals diagnosed with AjD. It could be acknowledged that AjD may manifest differently, leading to discrepancies in the prevalence rates.

In that scenario, the demographic characteristics of the considered sample play a significant role in the research outcomes. The differences in age, gender, cultural background, and socioeconomic status could have influenced the prevalence rates.

The results demonstrated that the ‘avoidance’ category of the ADNM-20 scale had the highest mean score (13.41) which consisted of the items: avoiding talking about a stressful situation, avoiding things that reminded them of a situation, or trying to suppress feelings that are a burden. Therefore, it is evident that ‘avoidance’ is a significant component of AjD among the apparel sector employees in this study, which would also explain the reason why many individuals refrain from voicing their feelings and seeking treatment for AjD.

Furthermore, the results revealed that symptoms were more prevalent among divorced females, employees who are working within the HR and IE departments, and individuals who are within the age group of 36 – 45 years. Females who worked in quality assurance and stores, tended to have higher ADNM-20 scores, compared to males in the industry. These findings reflect the general societal pressures of the national context, where female workers tend to face more stress than men. When comparing divorced females in the Sri Lankan context, they are over-scrutinized in the workplace leading to additional mental trauma (Adikaram, 2019), resulting in high ADNM-20 scores. They also tend to lack support from a partner in their emotional well-being, and therefore, have high stress levels. Whereas in the 36-45 age category, the high scores are explained as it is the period in an individual’s life which usually consists of many challenges, from career progression to work-life balance maintenance.

On another note, the HR and IE departments cater to the key components of the industry, where the HR department oversees all matters related to the large workforce from salary matters to personal issues whereas the IE department attempts to integrate manpower with the efficient use of machinery to maximise productivity. The individuals employed in these two departments are subjected to many challenges and obstacles, increasing the risk of developing symptoms of AjD. Therefore, from the analysis of results, it is evident that divorced female employees, employees within the 36-45 age category, and those within the HR and IE departments exhibit AjD symptoms with high intensity compared to their counterparts. This data suggests that workplace distress symptoms are higher due to the stress related to divorce, belonging to a middle-aged bracket, or being within certain industries where work demands are higher such as HR and IE departments. As work demands are higher in HR and IE, then psychological distress would constantly be higher. Further, the symptoms present widely in all departments may address that the individual trait can be a causative factor.

Specifically, in this research which was carried out in the Asian context, the perceived status of work stress and AjD may differ when compared to research in the West. This could be due to the changes in thought patterns of the individuals with the cultural influence. A higher prevalence rate can be observed due to several factors.As the apparel sector is often characterised by its demanding and target-oriented nature including repetitive tasks, long hours of working, and potential exposure to occupational hazards, which may lead to adjustment difficulties and increased stress.

However, the current research has attempted to enhance the generalizability of the findings to broader populations in the same field, by recruiting participants from eight (08) different factories, representing a sample from a diverse range of sociodemographic backgrounds. Despite a staggering prevalence rate, Sri Lanka lacks extensive and comprehensive research on AjD, and as a result, the public is unaware of the disorder. Thus, hinders individuals who have developed AjD or those who are vulnerable to developing AjD symptoms as a result of their workplace, age level, or relationship history. Therefore, future research could investigate the potential coping mechanisms, and identify interventions that can be utilised for individuals who have already developed the symptoms of the disorder and the contributing factors to the high prevalence rate of AjD among the apparel sector employees such as job demand and work setting. On the other hand, a longitudinal study could explain how AjD affects the mental health of an individual and the long-term consequences on the lifestyle. In addition, the studies can be further focused on how the existing interventions could be tailored to the unique needs of the apparel sector workers in terms of implementation and evaluation to promote better mental health outcomes.

The employment of a robust psychometric scale, ADNM-20 with established validity and reliability in assessing AjD has strengthened the current study. Such a methodological strategy would enhance the credibility of the findings. The reliability of the study findings was further ensured as these findings could be replicable and are transparent in terms of data analysis procedure. The current study does not encounter the effect of potential confounding variables such as family history, personal experiences of trauma exposure, and other life stressors that may influence the occurrence of AjD. The validity of the findings would have been affected in a situation where such factors were not taken into consideration. Another limitation of the study is the lack of qualitative data to capture the perspectives of middle-level management apparel sector employees regarding their difficulties in managing AjD.

As the study is solely based on quantitative data, incorporating a qualitative phase could provide more valuable insights into the contextual factors and lived experiences contributing to this higher prevalence rate.

## V. Conclusion

In consideration of all factors, the study attempted to investigate the prevalence rate of AjD among middle-level, apparel sector employees in Sri Lanka. The results demonstrated a high prevalence rate of 56.33% among the target population with the ADNM-20 avoidance category emerging as the highest-rated subscale. In addition to this, it was evident that divorced females, employees within the 36-45 age category, and those employed in the HR and IE departments obtained higher ADNM-20 scores, revealing that they presented severe symptoms. The development of AjD is due to a wide range of factors ascertained in the workplace, age, and other related factors. Therefore, based on the findings, it can be concluded that AjD is highly prevalent among middle-level employees in the apparel sector of the country. Further research must be conducted to broaden knowledge of stress in the workplace and to provide interventions that can help manage the symptoms of AjD.

## Acknowledgements

My sincere appreciation to everyone who supported me throughout the path taken to complete the research paper. My special thanks go to Kotelawala Defence University, Sri Lanka for their perceptive comments and encouragement with necessary approvals.

My study and research would not be possible if not for the enormous support rendered by the participants despite their day-to-day busy schedules and always allocating time for me when required.

Nothing would have been possible if my family had not stood by me throughout the process with a great deal of sacrifices.

## Abbreviations and Specific Symbols

AjD - Adjustment Disorder
ADNM 20 -Adjustment Disorder New Module 20 Questionnaire
DSM - TR - Diagnostic and Statistical Manual of Mental Disorders Text Revision
ICD - International Classification of Diseases

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# *Exploring the Impact of Envy as a Moderator Between FoMO and Social Media Fatigue*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
The emergence of various social media platforms with complex features and diverse devices has led to the fear of missing out (FoMO) on using these facilities, ultimately resulting in exhaustion. The fear, anxiety, or worry of missing out on various opportunities and information often drives excessive social media usage. Building on previous research, FoMO is frequently associated with social media fatigue, yet there has been no research to date that considers envy as a moderator. This study aims to examine the relationship between FoMO and social media fatigue moderated by envy among social media users. A survey was conducted using a quantitative methodology with participants aged 18 and above who have a minimum of two accounts. This is based on the fact that social media users in Indonesia are predominantly aged 18 and above, and the wide variety of social media platforms leads individuals to have more than one account. This analysis aims to investigate the impact of the moderation variable using Hayes' PROCESS Model 1 in SPSS 27. The results of this study indicate that malicious envy significantly serves as a moderator between FoMO and social media fatigue, especially in the group where malicious tendencies are at a low level. This is in contrast to benign, which shows not significant. This research is expected to contribute to understanding the dynamics of the emergence of fatigue feelings in using social media and the emotions that exacerbate these feelings of fatigue.

Keywords: Social Media Fatigue, FoMO, Benign Envy, Malicious Envy, Moderator

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## Introduction

The multitude of various social media platforms has influenced the way users interact. Interactions that were originally done face-to-face can now be represented and facilitated through various features on different social media platforms. The utilization of social media allows users to create profiles, build relationships, and form groups or communities to connect with each other, leading to a widespread adoption of social media (Boyd & Ellison, 2007; Kietzmann et al., 2011). Communication spaces and roles have been digitized, enabling individuals to choose spaces for desired activities. Social media platforms provide spaces for sharing, exchanging information about identity, knowing the presence of other users, engaging in conversations, building reputations, forming relationships, and even conducting various business activities (Kietzmann et al., 2011; Okonkwo & Awad, 2023). The shift towards digitalized communication spaces has resulted in some individuals making social media their primary space, leading to issues such as dependence on social media and ultimately resulting in social media fatigue.

In Indonesia, with a population of 276.4 million in January 2023, there are 167 million social media users, equivalent to 60.4% of the population (Kemp, 2023). As of early 2023, popular social media platforms in Indonesia include Facebook with 119.9 million users, YouTube with 139 million users, Instagram with 89.15 million users, TikTok with 109.9 million users, Facebook Messenger with 27.30 million users, LinkedIn with 23 million users, Snapchat with 3.55 million users, and Twitter with 24 million users. The multitude of platforms, combined with the intensity of usage among the Indonesian population averaging 3.2 hours per day (Dihni, 2022), increases the likelihood of experiencing fatigue. This can have physical and mental health implications, including decreased self-esteem, increased anxiety, the development of unhealthy behaviors, and a connection with elevated depression (Beyens et al., 2016; Dhir et al., 2018; Elhai et al., 2020; Wolniewicz et al., 2018).

Social Media Fatigue (SMF) is defined as the phenomenon of exhaustion caused by social media use, leading users to withdraw from it (Zhang et al., 2021). In addition to fatigue, SMF is characterized by other negative emotions such as stress and subjective feelings of tiredness, boredom, or burnout in individuals using social media (Hattingh et al., 2022; Ravindran et al., 2014; Zhu & Bao, 2018). According to Sweller, Cognitive Load Theory (CLT) can explain how social media fatigue occurs (Ashiru et al., 2023). CLT describes how human memory has limited capacity and can become overloaded with excessive information, leading to social media fatigue due to cognitive load during social media use.

One of the factors that exacerbates SMF is the fear of missing out on opportunities to engage in enjoyable activities together. Commonly referred to as FoMO (Przybylski et al., 2013). In other literature, FoMO refers to the need to interact with others and stay connected to what they are doing (Sette et al., 2020). FoMO is characterized by the concern that friends or family are enjoying valuable experiences when they are not present (Ashiru et al., 2023). This fear drives individuals to stay constantly connected on social media to ease the process of obtaining information about others' experiences and activities. The fear of missing out, as observed in various studies, leads to increased participation in social media, ultimately resulting in fatigue (Dhir et al., 2018; Hattingh et al., 2022; Świątek et al., 2021). This is because FoMO can create excessive and compulsive demands in social media use, contributing to feelings of fatigue (Wiesner, 2017).

On the other hand, in addition to FoMO-induced social media fatigue, the sense of closeness among social media users can facilitate judgments about each other. One form of judgment is the emergence of envy towards others (Lange & Crusius, 2015). Envy is defined as a feeling of low self-worth, hostility, and hatred that arises when others possess what one desires (Smith & Kim, 2007). Unlike jealousy, which is associated with the desire to protect what one already has, envy is related to the desire for what one does not yet possess (Smith & Kim, 2007; Tandon et al., 2021). Envy can be a cause and worsen social media fatigue through anxiety and feelings of loneliness (Yan et al., 2023). Envy can induce anxiety by pushing individuals to focus on their shortcomings, thus worsening social media fatigue (Yan et al., 2023).

This research focuses on examining the relationship between FoMO and social media fatigue moderated by envy, whether benign or malicious. As of now, there has been no research directly treating envy as a moderating variable. The researcher hypothesizes that higher levels of envy (both benign and malicious) strengthen the impact of FoMO on social media fatigue. This is based on compulsive behavior when experiencing FoMO and the influence of envy, which drives individuals to focus on their shortcomings, potentially worsening the feeling of social media fatigue. Based on the existing literature, the researcher develops the following hypotheses:

H 1. Benign envy can significantly moderate the relationship between FoMO and social media fatigue.

H 2. Malicious envy can significantly moderate the relationship between FoMO and social media fatigue.

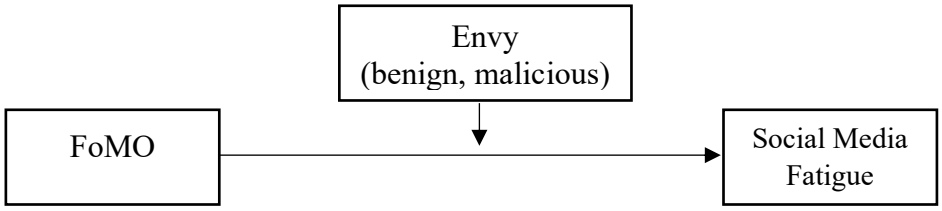



Figure 1: Research hypothesis

## Method

### *Participants*

This study is quantitative, with data collected from 210 participants using non-probability sampling, specifically purposive sampling technique. Participants were required to meet the criteria of being (1) aged 18 and above and (2) having a minimum of two social media accounts. Recruitment of participants took place through online social networks after obtaining their informed consent. The rule of thumb for determining the minimum sample size in this study, according to Muthén & Muthén, (2002), ranged from 150 to 315 participants. The participant composition included 39.05% males and 60.95% females, with 70% having a background in bachelor's degree. The majority of participants used 4 to 6 social media platforms, with 4 platforms at 22.38%, 6 platforms at 18.57%, and 5 platforms at 16.67%. The most common time spent on social media per day falls within the range of 3-4 hours (30.48%), followed by 5-6 hours (23.33%), and over 6 hours (22.86%). The social media platforms used by participants are as follows: WhatsApp (100%), Instagram (98.10%), Youtube (73.33%), TikTok (55.71%), Twitter(X) (48.10%), Telegram (45.24%), Facebook

(39.52%), LinkedIn (33.33%), Pinterest (25.71%), Line (9.05%), Threads (7.62%), Discord (5.24%), Snapchat (1.90%), Tumblr (1.90%), Reddit (1.90%), and Other (0.95%).

### *Data Analysis*

In the beginning, the researchers conducted a test of normality assumption using skewness and kurtosis. All variables considered in this study have met the normality test. Then, descriptive analysis was then performed to understand the respondents' characteristics. Confirmatory factor analysis was conducted to test the validity of items involved in the regression analysis. The maximum likelihood (ML) method was employed for estimating continuous data (Umar & Nisa, 2020). JASP version 0.18.1.0. was used for both descriptive analysis and confirmatory factor analysis in this study.

Subsequently, the researcher conducted descriptive analysis on variables and multiple regression analysis on FoMO and social media fatigue moderated by envy. To examine the moderation variable, Hayes' PROCESS Model 1 (Hayes, 2022) with SPSS 27 software was employed.

### *Instrumentation*

Three measurement tools were utilized in this study, with assessing the construct validity through confirmatory factor analysis. The indicators used for testing goodness of fit was RMSEA (0.08), following Brown, (2006). After achieving a fitting model, the next step involved examining the factor loading for each item. If each item had a z-value greater than 1.96, it was deemed valid (Umar & Nisa, 2020). Once all items were validated, these items from each measurement tool were used to calculate the factor score, which would then be employed for regression analysis.

Firstly, to measure social media fatigue, the Social Media Fatigue Scale (SMFs) was utilized, developed by Zhang et al., (2021). The scale consisted of 15 items covering cognitive, behavioral, and emotional aspects. After conducting CFA, an RMSEA of 0.11 was obtained, indicating that the model was not fit. Modification indices (MIs) were applied to release measurement error parameters in the model. After modification, an RMSEA of 0.07 was achieved, demonstrating unidimensionality. All items were deemed valid as they had z-values >1.96 and positive factor loadings. The SMFs instrument in this study had a Cronbach's alpha (α) value of 0.81.

Secondly, the instrument used to measure FoMO was the Online Fear of Missing Out Inventory (ON-FoMO) developed by Sette et al., (2020). This scale comprised 20 items covering four factors: the need to belong, need for popularity, anxiety, and addiction. CFA resulted in an RMSEA of 0.14, indicating that the model was not fit. Modification indices (MIs) were applied for model modification, and after modification, an RMSEA of 0.07 was achieved, indicating unidimensionality. This finding aligns with Sette et al., (2020) who considered ON-FoMO as unidimensional. All items were valid as they had z-values >1.96 and positive factor loadings, except for item 9, which was excluded from further analysis due to a factor loading discrepancy. The ON-FoMO instrument in this study had a Cronbach's alpha (α) value of 0.89.

Thirdly, the instrument used to measure envy was The Benign and Malicious Envy Scale (BeMaS) developed by (Lange & Crusius, 2015). This scale consisted of 10 items covering

benign and malicious dimensions. CFA resulted in an RMSEA of 0.09, indicating that the model was not fit. Modification indices (MIs) were applied for model modification, and after modification, an RMSEA of 0.08 was achieved. All items were deemed valid, as they had z-values >1.96 and positive factor loadings. The BeMaS instrument in this study had a Cronbach's alpha (α) value of 0.80 for the benign dimension and 0.89 for the malicious dimension.

## Results

Based on the descriptive analysis results in Table 1, the participants in this study predominantly exhibited low social media fatigue (52.4%), high FoMO (50.5%), high Benign envy (57.6%), and low Malicious envy (58.1%).

**Table 1:** *Results of descriptive analysis on research variables*

| Variable | M | SD | Low | | High | |
|---|---|---|---|---|---|---|
| | | | n | % | n | % |
| Social Media Fatigue | 50.00 | 9.21 | 110 | 52.4 % | 100 | 47.6 % |
| Fear of Missing Out | 50.00 | 9.53 | 104 | 49.5 % | 106 | 50.5 % |
| ENVY (Benign) | 50.00 | 9.05 | 89 | 42.4 % | 121 | 57.6 % |
| ENVY (Malicious) | 50.00 | 9.52 | 122 | 58.1 % | 88 | 41.9 % |

In the hypothesis testing results regarding the influence of FoMO on social media fatigue moderated by benign, the following findings were obtained:

**Table 2:** *Result from Regression Analysis Examining the Moderation of the FoMO on Social Media Fatigue by Benign*

| | Coeff | SE | t | p | LLCI | ULCI |
|---|---|---|---|---|---|---|
| Constant | 50.02 | 0.63 | 79.77 | 0.00 | 48.78 | 51.25 |
| FoMO (X) | 0.25 | 0.07 | 3.77 | 0.00 | 0.12 | 0.39 |
| Benign (W) | 0.19 | 0.07 | 2.62 | 0.00 | 0.05 | 0.33 |
| FoMO x Benign (XW) | -0.00 | 0.00 | -0.08 | 0.93 | -0.01 | 0.01 |
| | | | $R^2$ = 0.14, MSE = 74.07<br>F(3, 206) = 11.17, p<0.05 | | | |

Based on the moderation regression table above, the results indicate the influence of FoMO on social media fatigue moderated by benign ($F(3, 206) = 11.17$, $p < 0.05$, $R2 = 0.14$). This means that 14% of the proportion of variance in social media fatigue can be explained by both variables.

However, the results of the interaction between FoMO and benign on social media fatigue showed that it was not significant. The interaction results reveal $p = 0.93$, LLCI = -0.01, and ULCI = 0.01, crossing through 0. This implies there is no moderating effect of benign on the relationship between FoMO and social media fatigue.

Moving on to the hypothesis testing results regarding the influence of FoMO on social media fatigue moderated by malicious, the findings are as follows:

**Table 3:** *Result from Regression Analysis Examining the Moderation of the FoMO on Social Media Fatigue by Malicious*

| | Coeff | SE | t | p | LLCI | ULCI |
|---|---|---|---|---|---|---|
| Constant | 50.47 | 0.59 | 85.98 | 0.00 | 49.32 | 51.63 |
| FoMO (X) | 0.32 | 0.07 | 4.92 | 0.00 | 0.19 | 0.45 |
| Malicious (W) | 0.21 | 0.06 | 3.21 | 0.00 | 0.08 | 0.34 |
| FoMO x Malicious (XW) | -0.02 | 0.00 | -3.94 | 0.00 | -0.02 | -0.01 |
| | | | $R^2 = 0.19$, MSE = 69.34 | | | |
| | | | $F(3, 206) = 16.62$, $p<0.05$ | | | |

Based on the moderation regression table above, the results indicate the influence of FoMO on social media fatigue moderated by malicious ($F(3, 206) = 16.62$, $p < 0.05$, $R2 = 0.19$). This means that 19% of the proportion of variance in social media fatigue can be explained by both variables.

Furthermore, the results of the interaction between FoMO and malicious on social media fatigue show significant and negative outcomes. The interaction results reveal $\beta = -0.02$, $p < 0.05$, LLCI = -0.02, and ULCI = -0.00, not crossing through 0. This implies that there is a moderating effect of malicious on the relationship between FoMO and social media fatigue. The role of malicious in moderating FoMO and social media fatigue, when considering conditional effects, is positive and significant for low malicious levels with -1SD below average (b = 0.45, SE = 0.08, p = 0.00, LLCI = 0.30, ULCI = 0.61), medium levels (b = 0.32, SE = 0.07, p = 0.00, LLCI = 0.19, ULCI = 0.45), and high malicious levels with +1SD above average (b = 0.16, SE = 0.07, p = 0.02, LLCI = 0.03, ULCI = 0.30). However, those with low malicious tendencies show a more significant impact on FoMO and social media fatigue.

## Discussion

This paper aims to verify two hypotheses. Firstly, whether benign can moderate the relationship between FoMO and social media fatigue, and secondly, whether malicious can significantly moderate the relationship between FoMO and social media fatigue. The findings indicate that although Liu & Ma, (2018) confirmed that envy can lead individuals to social media fatigue, it does not universally apply to being a moderator variable between FoMO and social media fatigue. There is a fundamental difference between benign and malicious envy. Benign, which motivates individuals to surpass those above them, and malicious, which drives individuals to demean and undermine the advantages of others (Lange & Crusius, 2015), have distinct differences.

The hypothesis of this study regarding benign moderating the influence of FoMO on social media fatigue is rejected. This indicates that benign does not necessarily influence the direction and magnitude of the relationship between the two variables. Benign, which encourages individuals to surpass others, actually motivates them to interact with the envied. Therefore, when individuals with benign tendencies sees the envied on social media, it does not make them use social media until they feel tired. Instead, social media is considered beneficial as a means to interact and learn from the envied (Yan et al., 2023).

Next, the subsequent hypothesis, that malicious moderates the influence of FoMO on social media fatigue, is accepted. The results show that the interaction between FoMO and malicious on social media fatigue is significant and negative. This implies that the need to

interact with others on social media drives users to remain on social media when accompanied by feelings of maliciousness. Malicious envy triggers users to persistently use social media as a reason when the need to connect with others strengthens.

However, whether at low, moderate, or high levels, malicious behavior demonstrates significant outcomes. This indicates that regardless of the level of malicious, individuals with a need to connect with others are inclined to continue using social media. However, the difference lies in individuals at a high malicious level, whose desire to remain on social media is not as strong as those at a low malicious level. This seems to be related to individuals at a high malicious level tending not to want to interact with the envied (Van de Ven et all in Yan et al., 2023). Those at a high malicious level are potentially inclined to ignore information uploaded by the envied and may even block them, thus reducing social media usage. Therefore, it is reasonable to assume that individuals with low malicious tendencies exhibit a more significant correlation with FoMO in social media fatigue.

These findings indicate the reality that the presence of envy in individuals does not directly worsen the influence of FoMO on social media fatigue. Depending on the type and level of envy present in individuals, whether benign or malicious, whether the feeling of envy is high or low.

## Conclusions

This research provides an overview that feelings of envy do not entirely moderate the influence of FoMO on social media fatigue. It is malicious envy, whether at low, moderate, or high levels, that shows significance towards FoMO and social media fatigue. However, malicious envy at a low level is more significant compared to other levels.

## Limitations and Future Work

This study has limitations regarding the use of instruments in the research process. Reconsideration is needed regarding the use of the online Fear of Missing Out Inventory (ON-FoMO) by Sette et al., (2020) , which is linked to the construct of social media fatigue by Zhang et al., (2021). This is based on the difference in operational definitions between ON-FoMO by Sette et al., (2020) and FoMO by Przybylski et al., (2013). ON-FoMO focuses on the need to interact with others and stay connected to what they are doing, while FoMO focuses on the feeling of worry due to not being involved. This is supported by the research of Świątek et al., (2021), who previously used the construct of social media fatigue by Zhang et al., (2021) and linked it to FoMO by Przybylski et al., (2013). Therefore, future researchers could try using the same variables but with different instruments. Certainly, this will affect the results obtained from the research.

## Acknowledgment

LPDP Indonesian Ministry of Finance Scholarship Fund for funding the participation in presenting the abstract at ACP2024.

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# *Factors of Workplace Spirituality Enabling Environmental, Social and Governance (ESG) Goals in Business Organizations*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
Positive human behavior towards environment and society is the key to enable ESG (Environmental, Social and Governance) goals in business organizations. Workplace Spirituality (WPS) can play a crucial role in engaging employees psychologically to transform their behavior towards ESG. Objective of the study is to examine key factors of workplace spirituality and its impact on ethical, sustainable, and social behavior of employees. Research methodology covers conducting a systematic literature review to identify gaps, contradictions and opportunities and develop a conceptual framework. It has been established through literature review that various isolated studies were conducted on WPS however strong need is identified to devise 'a holistic conceptual model', which is achieved through this systematic and structured study. The outcome of the study establishes a positive correlation of WPS with employee behavior in all respect i.e. Individual, organizational and leadership level. Conceptual model covers four independent variables i.e. organizational aspects, leadership style, Individual psychological capabilities (emotional and spiritual intelligence) and higher purpose. Study outcome shall benefit management practitioners and companies by enriching understanding on factors of WPS in the business organizations and achieving ESG goals by transforming employee's behavior. The study signifies that decisions and practices adopted by the management with spiritual values such as honor, morality, kindness, hope, love and nurturing will help to deal with corporate challenges more effectively. This study also contributes to the Maslow Theory on motivational behavior where self -transcendence based on spiritual values is considered as the ultimate level of motivation for human behavior at work.

Keywords: Workplace Spirituality (WPS), Spirituality, Sustainable Business Organization Spiritual Leadership, ESG, Organizational Spirituality, Spirituality and Religion

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## Introduction

Environment, Social and Governance (ESG) goals are very important for business organizations today which addresses critical global issues pertaining to climate change, resource scarcity and social inequality. Business entity is a part of the society therefore cannot ignore its impact on external environment while aiming for profits. Business today aims to achieve goals aligned with triple bottom-line i.e., people, profit and planet.

These ESG goals can never be achieved only through regulations, framework and policies therefore positive human behavior towards environment and social cause is the key to make ESG successful.

Workplace spirituality (WPS) can play a crucial role in enabling ESG practices in business organizations and focus on ethical and sustainable business practices. Incorporating spirituality at the workplace can engage employees not only physiologically but psychologically as well. Awakened spiritual aspects of human behavior at workplace provides a deeper understanding and connection with work and its higher purpose. WPS motivates to perform a meaningful work making a difference and impact to the society at large. It thereby helps taking ethical decision and enhances the commitment of employees towards pro-environmental and social behavior to care for society and nature.

Environment, Social and Governance (ESG) goals of business organization cannot be achieved through policy and regulations only. Human behavior is the most important factor for success of ESG. ESG efforts would be completed just as tick the box activity to fulfill the regulatory norm in absence of internalization of values by every colleague and leader. Workplace spirituality can bring a better engagement, motivation and a higher purpose at work which helps to drive an ethical and sustainable business.

The purpose of this study is to explore various meanings of WPS and how it is different from religion and individual spirituality. The study further explores various elements and factors of workplace spirituality that enables value-driven organization and facilitate to achieve ESG goals.

Workplace spirituality not only leads to beneficial personal outcomes, but also leads to better productivity. Employees who work for the organization that adopts WPS are more ethical and less fearful and more committed to the work. Research suggests that the encouragement of spirituality in the workplace can lead to benefits in the areas of creativity, honesty and trust, personal fulfillment, and commitment, which will ultimately lead to increases organizational performance (Neck & Krishnakumar, 2016). Culture of any business organizations brings the values that shape and justify its mission. workplace spirituality enables integration of personal and organizational values into day-to-day life of the organization. It brings positive attitude towards work and lead to motivated workforce. This ultimately helps improving capability, performance, satisfaction, and quality of service of the employees (Anvari, R., Barzaki, A. S., Amiri, L., Irum, S., & Shapourabadi, S. (2017).

Workplace Spirituality is not about religion or accepting a particular bleed or system, it's about leaders and followers who understand themselves as spiritual being and who have sense of calling compassion that provides meaning and purpose for the employees and organization.

## Need of Workplace Spirituality for Business Organizations in India

As reinforced in detail by Agarwal, S., Baral, V & Gupta, S. 2019 that India is considered to be a hub for spiritual values and practices however there is still lack of awareness and insights for application of spiritual practices at workplace. Spirituality is being perceived as a subject matter for old and retired as means for cleansing the soul or gaining moksha. Various western countries particularly Japan has given significant importance to embed spiritual values at workplace which has been beneficial for business organisations. Importance and research on workplace spirituality is picking up in the entire world and indian corporates must give desired focus to meet future global challenges more effectively. There are various studies in the western countries however more research is required from the context of Indian business organisation.

The purpose of the study is to examine various factors that enables workplace spirituality in business organisations in India which will help them to create a spirituality based positive and energetic work environment that will enhance wellbeing of employees, social responsibility, business ethics and employee's sustainable behaviour. Majority of studies are performed in Western and US setting and there is certainly need of research on various factors of WPS in Organisations operating in India (Meng. Y. 2016).

## Research Questions

1. What are the organizational attributes that impacts Workplace Spirituality (WPS)?
2. Whether leadership style influence Workplace Spirituality in the organization?
3. What are the factors w.r.t. individual psychological competencies of employee that enable workplace spirituality?
4. Whether WPS is influenced by working with higher purpose mindset in the organization.

## Definition and Scope of Workplace Spirituality (WPS)

While the attention towards workplace spirituality is growing, there is debate as to what exactly "Workplace Spirituality" means. There seems to be multiple views on workplace spirituality. It could be contended that there are different definitions of WPS. Further, it has been observed in various studies and research that spirituality, religion, and workplace spirituality are various interconnected terms and concepts. We examined various perspectives and definitions of workplace spirituality and how it is different from individual spirituality and religion. These concepts in various literature as described in below three tables.

| Individual Spirituality | Authors |
|---|---|
| The completeness of spiritual enrichment provides happiness and satisfaction to individual which result into more creativity. | (Turner, 1999) |
| Spiritual practice by individual leads to better insights and better mental growth and development which leads to improvement of a personal as a whole, yielding a more comprehensive self. | (Burack 1999) |
| Spirituality at individual level has been associated with Maslow's law of higher needs such as "Belonging and sense of achievement " | (Burack, 1999, p.284) |
| Spirituality to an individual leads to a feeling of completeness when you come to work. | (Turner, 1999) |

Table 1 - Definition and views on "Individual Spirituality" in previous literatures

| Religion | Authors |
|---|---|
| Spirituality is something which is beyond the rules of religion. | (Guillory, 2000) |
| Spirituality avoids formal and ceremonial connotation of religion. It is inner search for meaning and fulfillment that may be undertaken by anyone regardless of religion. | (Graber 2001, p.40) Neck |
| Religion consists of beliefs, actions and institutions which assumes the existence of supernatural entities with power of action. | (Bruce, 1996, p.7) Neck |
| Christian believed that spirituality is call for action. | (Bruce, 1996,) Neck |
| In Buddhist's view, hard work and devotion are tool used to modify and individual's life and also institution as a whole which ultimately results in total enrichment of life & work. | (Jacobson,1983) Neck |

Table 2 - Definition and views on "religion" as different from "spirituality "
in previous literatures

| Workplace Spirituality | Authors |
|---|---|
| When an organization encourages spirituality then it is encouraging the people to bring their whole to work. | (Neck and Milliman, 1994) |
| Spirituality is about acknowledging that people come to work with more than their bodies and minds, they bring individual talent and unique spirits. | (Leigh,1997 p.26) Neck |
| WPS is a framework of organizational values evidenced in the culture that promote employees experience of transcendence through the work process, facilitates their sense of being connected to others in a way that provides feelings of completeness and joy. | Giaclone & jurkiewicz 2003) Comparative analysis model |
| WPS is recognition of inner life that nourishes and is nourished by meaningful work that takes place in the context of community. | (Ashmos and Duchon 2000) Comparative analysis model |
| WPS is employee experience of self-transcendence, meaning, and community in the workplace and it also acknowledges that these experiences could come from various mechanisms including organizational ones. | (Pawar 2008) Comparative analysis model |

Table 3 - Definition and views on " Workplace Spirituality" in previous literatures

On reviewing various definitions of workplace spirituality, there are three main aspects identified clearly i.e., Inner life to the workplace, purposeful and meaningful work and connectedness with the co-workers and community at large. (Badrinarayanan & Madhavaram, 2008). We see multiple meanings and dimension of workplace spirituality which is very natural and logic as subject is very complex. There is no single recognised and established definition of WPS and there is need to have a holistic definition covering various dimensions (Dufrene, T., 2021).

After detailed systematic literature review, the below holistic definition of workplace spirituality (see Diagram 1) is developed.

"WPS is adopting spiritual values while discharging corporate functions in organisation (individual and organisational level) by:

- bringing whole person to work and not to leave your soul at home,
- performing meaningful work and making a difference and impact to the society at large,
- creating strong interconnectedness with colleagues and organization, striving to achieve a higher purpose beyond individual role in organization connecting nature, ecosystem, and environment and
- achieving mystical experience and transcendence which leads to higher and continuous self-motivation."

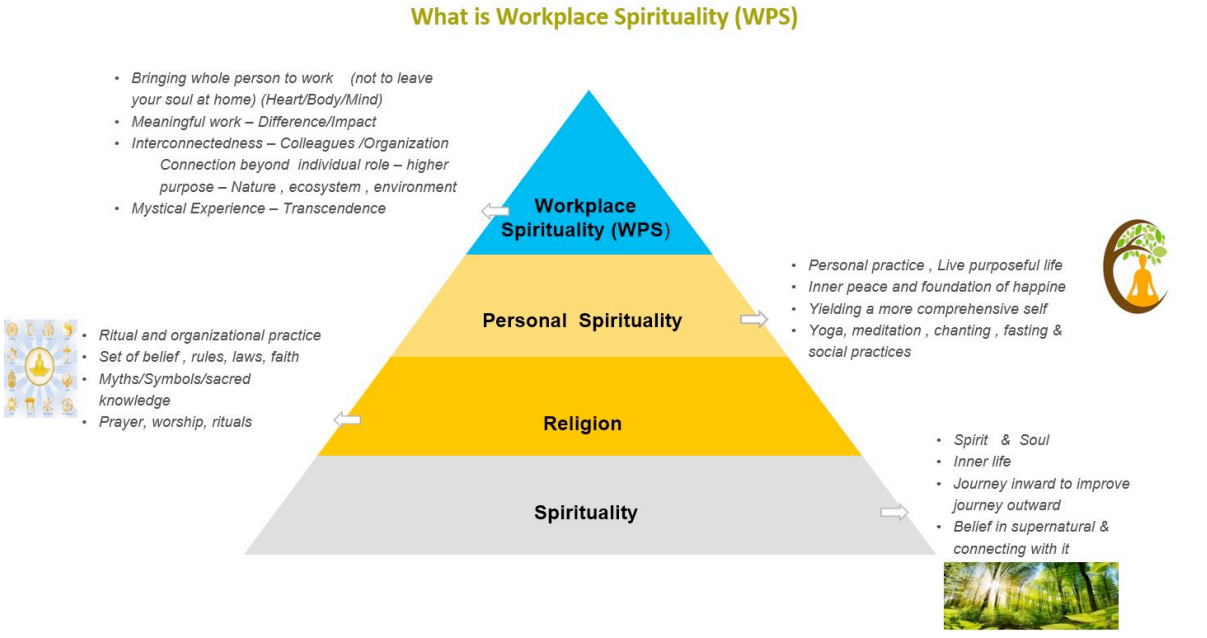



Diagram 1 - Definition of Workplace Spirituality

## Workplace Spirituality – Systematic Literature Review

Based on the topic of research, the goal of the literature review is to study the prior body of knowledge and research gaps in respect of Workplace spirituality (WPS).

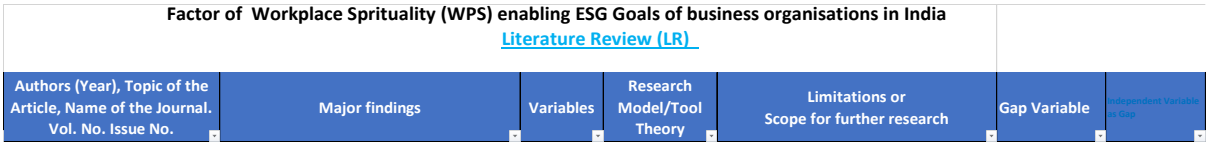
Within the scope of this study, secondary source of data was used to seek knowledge already existing on this topic. To perform the search for literature on this topic, leading international electronic databases, journals publications & articles, books & dissertations, white papers and

Google scholar were used. Most of the research applied to this thesis was published between 2017 and 2023. However few research literature or studies published before 2017 were included that reflected a significant contribution or inclusion restated a significant development in the field of workplace spirituality or its factors.

There were many search words were used including workplace spirituality, spirit at work, factor affecting workplace spirituality, ESG (Environment, Social and Governance), organizational culture, spiritual leadership, ethical leadership, personal values at work, emotional intelligence at work, spiritual intelligence, transformational leadership, higher purpose at work, sustainable behavior at work and business ethics.

A mapping of research gap describing the limitations of the research in the existing literature and research findings was carried out to position the scope of this this research. Research gaps plays an important role in discovering new facts and making new contribution to the body of knowledge.

A systematic literature review database (in excel sheet) was formulated with over 250 literatures across all four independent variables and four outcome variables. Diagram 2 illustrates how literature were summarized and analyzed.



Factor of Workplace Sprituality (WPS) enabling ESG Goals of business organisations in India

Literature Review (LR)

| Authors (Year), Topic of the Article, Name of the Journal. Vol. No. Issue No. | Major findings | Variables | Research Model/Tool Theory | Limitations or Scope for further research | Gap Variable | Independent Variable as Gap |
|---|---|---|---|---|---|---|

Diagram 2 - A snapshot exemplifying the summary of systematic literature review

There are various studies on workplace spirituality and its impact on the organizational commitment and performance. Number of studies shows that adoption of spirituality at workplace is at a nascent stage and there is tremendous scope for research in this area. As this is relatively new area of research, the present study will bring various factors, elements and variables effecting Workplace Spirituality (WPS) in business organizations in India. Although several studies have been conducted in the areas of workplace spirituality empirical and quantitative studies in this area is scarce (Hisam, M. W., 2021).

**T**he interest in the topic of Workplace Spirituality (WPS) is growing rapidly. Research study (Meng. Y., 2016) describe various perspective and theories on spiritual leadership at the workplace. It explains the need of effective and motivational leadership driven by values and shared vision. It provides detailed study on leadership through models of spirituality and its relevance to management at workplace. The study finds that spirituality driven leadership empowers care of body, mind, heart, and spirit of the colleagues in the organization. The study also indicates that spirituality at work is at early stages and most of the organizational theories pertain to western religious and practices.

Spirituality and Management once thought incompatible have fallen in love in recent time. An active spiritual life helps employees finding purpose and creates positive energy at workplace. Positive energy and working with purpose increase the commitment level and thereby output and performance. There are some theories and approaches on spirituality but there is limited application of model, and it is an emerging area of research. Potential benefits

of spirituality are hardly quantified in research models (Aravamudhan, N. R., & Krishnaveni, R., 2014).

There is a recent study (Paul, M., Jena, L. K., & Sahoo, K., 2020) that examines the importance of agile workforce in academic and teaching institutions. It also describes the impact of Workplace Spirituality (WPS) on Agile teaching workforce. Agility brings innovation, positive attitude, and energy at workplace. The study emphasizes need of future research on the role of various other mindset and factors such as satisfaction, commitment, trust as mediating factor for workforce agility (Muduli, A., 2017).

An exploratory study (Garg, N., 2018) was conducted to examine the relationship between workplace spirituality and organizational commitment with reference to Indian setting. It was an interesting study which covers six elements and dimensions of workplace spirituality i.e. kritagayata, Swadharma, Lokasangraha, Authenticity, Sense of Community and Karma Capital. The study was done with a very small sample and there is ample scope of future research to study these factors using qualitative and quantitative approach.

There is dire need of adoption of workplace spirituality in hospitality and healthcare industry. One such study (Pirkola H., Rantakokko P. & Suhonen M., 2016) was conducted for healthcare institution to examine as to how nurse managers in healthcare center use workplace spirituality as a tool to increase job satisfaction and work outcome. The study also describes that adopting spirituality at work helps reducing staff turnover. The study was conducted with a healthcare center and particularly nursing department. There is abundant scope to cover other industry and functions where factors of workplace spirituality can be examined.

In various studies, impact has been seen of workplace spirituality on job satisfaction. One such study covers three dimensions of workplace spirituality i.e. engagement of employees, community sense and inner life connection. The detailed study defined nineteen themes such as ethics, honesty, integrity, and trust under workplace spirituality. The study emphasizes the need to conduct further research on inner and external job satisfaction (Misbah Hassan, Ali Bin Nadeem & Asma Akhter, Tahir Nisar, 2016).

One of the interesting studies (Adawiyah, W. R., Purnomo, R., Pramuka, B. A., & Sholikhah, Z. (2020) covers people aspect of Total Quality Management (TQM) and its relationship between job satisfaction and workplace spirituality. It demonstrates that the effectiveness of TQM can be significantly enhanced by embedding spirituality aspect at work. It leads to enhance the overall quality when workforce is positively and spiritually connected to their work. The study is conducted covering only an Islamic Bank in Indonesia, there is pressing need and ample scope to conduct research on these areas covering other industries and geographies in India.

Relationship and impact of adopting spirituality at work are also seen with respect to ethical conduct of the employees. One such study (Otaye-Ebede, L., Shaffakat, S., & Foster, S., 2020) was conducted covering 51 retail chain stores in UK involving 676 employees where the findings clearly revealed that workplace spirituality is positively related to ethical climate, motivation and moral judgement. The study highlights the clear need of future research for additional factors such as ethical leadership through spirituality at workplace.

A research in BFSI sector in India (Habeeb, S., 2019) assessed the relationship between Organizational Citizenship Behavior (OCB) and spirituality at workplace. The study demonstrated that engagement of employees and job satisfaction can be significantly enhanced by embedding spirituality aspects in the organization. It also defines different aspects and factors of OCB and its relationship with workplace spirituality. However, the employees participated in the research and survey were not agreed to disclose their position and did not want to discuss any organizational aspects to support qualitative findings. There is ample scope for future research on OCB and spirituality at workplace with robust qualitative and quantitative tools and methodology.

There is another research conducted with the Centre for Excellence in Leadership (CEL) as a case study of an organization and its leader (CEO) (Louis W. Fry, Ph.D., 2010). The study found that spiritual leadership is a growing paradigm and has the potential to guide organizational transformation and development of positive organizations that maximize the triple bottom line.

One other study (Lata, M., & Chaudhary, R., 2020) found that spirituality-based leadership and workplace spirituality are evolving concepts and practices in the business organizations. Theoretical knowledge as well as practical aspects of leadership ethics & values are very limited. The results confirmed that practicing workplace spirituality (WPS) in the business organization result into high reduction of uncivil behavior by the colleagues and managers. There is need of further research which can better comprehend possible connection between spirituality at workplace and incivility experienced by colleagues at work.

In recent research (Koburtay, T., & Haloub, R., 2020) the results provides that ethical and spiritual behavior of employees are influenced by P-O (Person- Organization) spirituality fit. The study further establishes that ethical behavior and conscious leadership is enhanced by bringing spiritualty at individual and organizational level. The result further shows that integration of workplace spirituality (WPS) in the business organization enhances good relationship, truthfulness and honesty.

A very detailed study (Majeed, N., Mustamil, N. M., & Nazri, M., 2018) concludes that spirituality at work plays a significant role to reduce stress and provide healthy work environment better job satisfaction. The concept of workplace spirituality is rooted in business ethics and spiritual leadership. There is need for future research work to examine the influence of spiritual leadership, transformational leadership and emotional intelligence on workplace spirituality in the organization.

With the help of the literature survey, the following independent variables were found to influence the Workplace Spirituality (WPS) in Indian organization.

a. Organizational Attributes
b. Leadership Style
c. Individual Psychological competencies
d. Higher Purpose at work.

**Maslow's Theory on Hierarchy of Needs**

In this study, Maslow's hierarchy of needs (Maslow, 1943) is researched and considered in detail. A recent study (Eleonora Louca, Saeed Esmailnia & Niki Thoma, 2021) describe that Maslow theory focused entirely materialistic and deterministic sphere of individual and

ignores the moral and spiritual aspect which is very important in human development and motivation (Seligman, 2011, p. 90; Garrison, 2001, p. 98, 100; Guillén, Ferrero, & Hoffman, 2015; Harter, 2006; Maritain, 1947/1972; Reader, 2006, p. 345). According to the researchers, Maslow's original theory is fully focused on "self" in the process of personal growth of individual in the organization. Maslow's original theory has been criticized by various scholars as a self-focused process for personal growth. In the later years (Maslow 1954), he extended that self-actualizing people do have attitudes that is centered on others and society. In fact, he included prosocial behaviors and personality traits such as interpersonal relations, tolerance, democratic character and dedication to others as few of the 15 characteristics of self-actualizing people (Maslow, 1987). Thus, during the later years he explored a further dimension of needs, while criticizing his original vision of self-actualization.

Maslow in his second edition of his book "Towards a Psychology of Being" (Maslow, 1968, p. iv) introduced the concept of transpersonal psychology and added new level to his pyramid above the need of self-actualization. He described and focused on transpersonal, transhuman, centered in the cosmos much beyond self-actualization that is much "bigger than we are."

Later in his life (Maslow, 1971) he developed Theory Z explaining that all self-actualizing people do not reach to transpersonal experience. He divided the self-actualizing people into two categories i.e., 'peakers' and 'non speakers.' He differentiated self-actualizers who obtain no experience of transcending (non peakers) and those for whom transcending experience is very important and central. He further described first type of people (non peakers) live for here and for immediate needs however trascenders (peakers) lives at the level of being, of inherent vales and gains peak experience with insights which transform their view of world and themselves (Maslow, 1971, pp. 270–271). Transcenders carry values of being including perfection, truth, goodness, unity, and they transcend the ego. All these aspects of transcendence resonate well with spirituality which can provide peak experience to colleagues at work.

Koltko-Rivera (2006, p. 302) in his detailed study referred to later version of Maslow 's hierarchy of needs model which extended and added self-transcendence as next level of motivational need beyond self-actualization. They further explained that Maslow reconsidered his theory and integrated spirituality as basic notion to it. This was considered as monumental shift in the conceptualization of human development & growth. At the level of self-transcendence, individual in the organization focus beyond his/her personal needs towards service to others and connected to the higher force and bigger purpose in life. (Bouzenita & Boulanouar, 2016, p. 66).

Maslow's later version of ultimate need of transcendence is more compatible with the notion of spirituality where people overcome self and commit themselves to higher purpose or goal.

In a recent study, Ackerman (2020) points out that with a shift in focus from self to others and higher purpose, Maslow added transcendence as next step further which is growth oriented and highest motivation for the person. This stage equates with sixth level of human needs in Maslow hierarchy as depicted in Diagram 3 below.

**Maslow Theory on Hierarchy of Needs – Later Version**

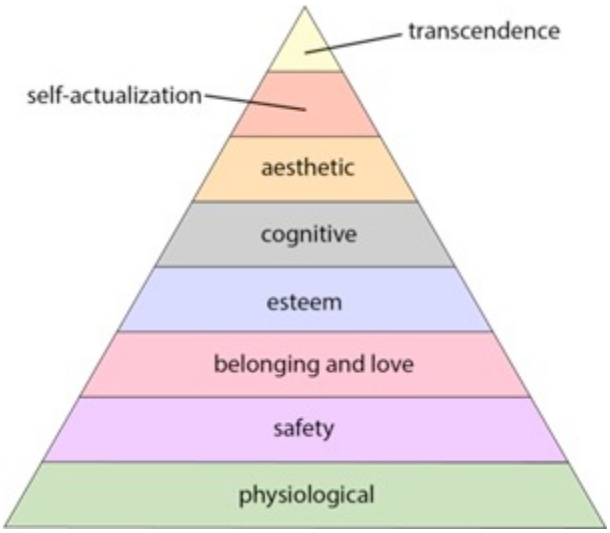



Diagram 3 - Later version of Maslow theory on hierarchy of needs

**Conceptual Model**

Conceptual model of the present study covers four independent variables of Workplace Spirituality derived from detailed systematic literature review. These variables influence the level of spiritualty and its impact at the workplace.

Various independent factors influencing workplace spirituality as dependent variables are as below:

**Organisational Attributes** cover various aspects of spirituality at organisational level which includes Organisation Citizenship Behaviour (OCB), Human Resource Practices & Policies and Organisational Culture and Values. It primarily focuses on environment and governance in the organisation that leads to positivity, creativity, and appropriate citizenship behaviour.

**Leadership Style** cover environment of caring and concern in the organisation infused by leaders. This brings cross functional collaboration and successful partnership through transformational and inclusive leadership. Spiritual leadership is also very important which focus on care for the society adopting triple benefit theory balancing profit, planet and people. Fair treatment and principled environment through ethical leadership is also an important factor to enhance spirituality at workplace.

**Individual Psychological Competencies Factors** mainly focused on individual psychological capabilities beyond Intelligence Quotient (IQ) and technical expertise which enhance workplace spirituality in the organisations. Spiritual intelligence helps to handle the corporate challenges with a holistic approach by providing deeper connection to the work. Freedom to express personal spiritual practices at workplace also plays an important role in enhancing workplace spirituality. Human resources policies and practices of the organisation developing and enhancing emotional intelligence further helps workplace spirituality (WPS).

**Higher Purpose at Work** focus on sense of meaningful work, responsible innovation and diversity and inclusion.

Based on detailed literature review evidencing research gaps, a conceptual model is developed. It describes these factors influencing Workplace Spirituality (WPS) and lead to employees' wellbeing, social responsibility and ethical & sustainable behavior which helps to achieve self-transcendence as illustrated in Diagram 4 as below.

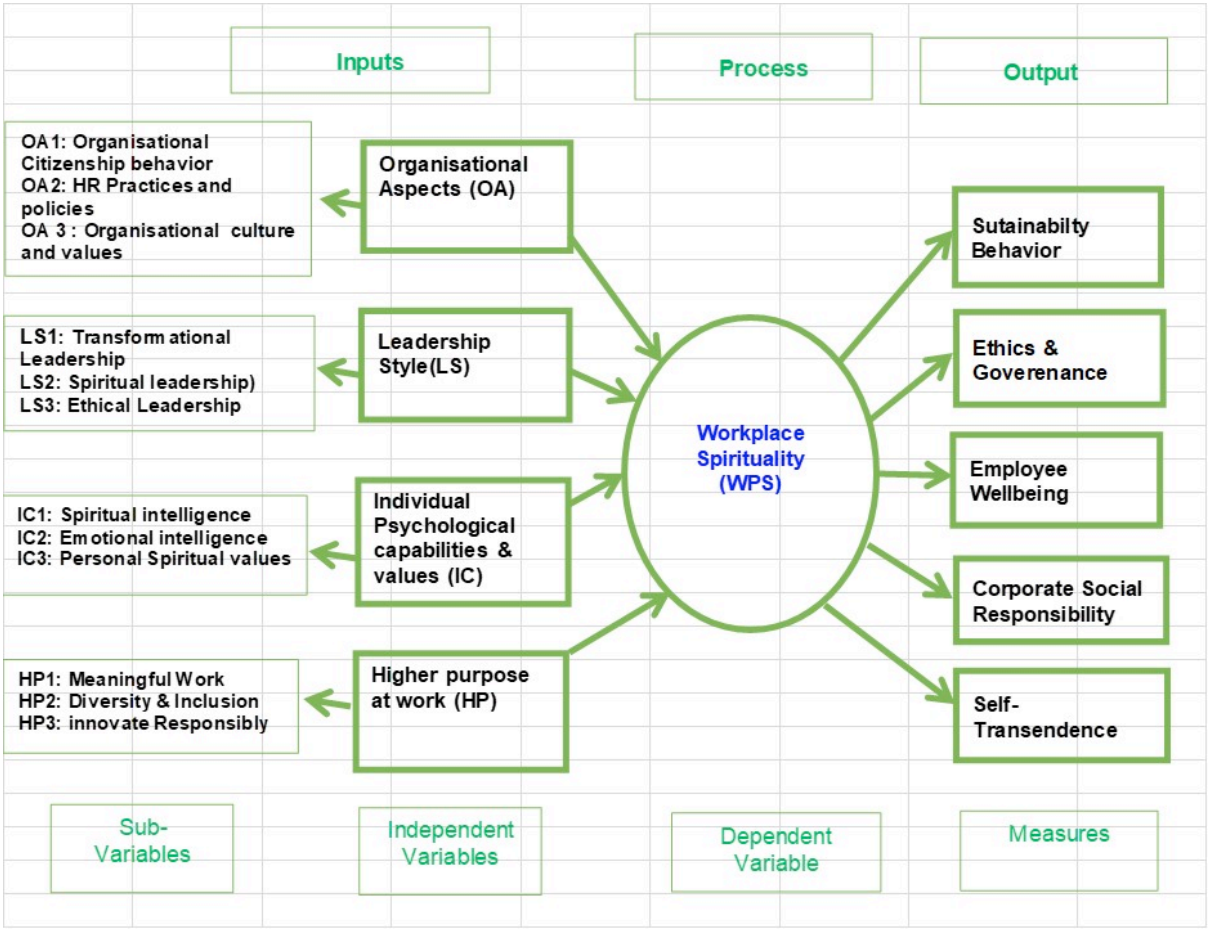



Diagram 4 - Conceptual Model based on systematic literature review

## Conclusion

In summary, the study based on detailed literature review developed the conceptual model on factors and impact of workplace spirituality in the business organization in India. It enhances the understanding of various factors and role of workplace spirituality in the organization and thereby facilitates achievement of ESG goals.

The study reveals that imbibing spiritual values at organisational, leadership and individual level to work for higher purpose enhances ethical, sustainable and social behavior. It thereby provides highest level of motivation at wok through self-transcendence and helps to achieve ESG goals of business organization.

Howell (T. R. Howell, 2013) conducted detailed research to find out the benefits of spirituality by examining more than 30 surveys. As per this detailed research, there were five key advantages by workplace spirituality in the organization.

1. Employees learned to be gracious and express gratitude. This generates positive energy which helps them to handle any difficult situation calmly.
2. Employees become more compassionate which leads to care for coworkers and society.
3. Spirituality helps people to flourish in any situation.
4. Spiritual values help colleagues to focus on internal life and perform best in the life.
5. In a spiritual work environment, employees enjoy their work and learn from the life experiences.

Further, the research emphasis that when spirituality is infused in our work culture of the organization, the following changes may take place at the workplace.

1. Business organizations adopt purpose driven approach in all their operations.
2. Management will more focus on mission and values in addition to efficiency and effectiveness.
3. Better understanding and adoption of workplace spirituality will reduce fear-based culture and enhance teamwork and partnership-based culture.
4. Decisions and practices adopted by the management will be aligned with spiritual values such as honor, morality, kindness, hope, love, nurturing and esteem.
5. Hierarchy based culture will be replaced by culture of collaboration, belongingness, and sense of community.
6. Open-door policy will be encouraged by the management where colleagues can speak freely without fear of reprisal.
7. There will be a shared attitude that products and services manufactured by the company are for the customers and are also beneficial for the community.

Moreover, it has been proven that “Spirited Workplaces” have done better with respect to profitability and a workplace without spirituality can ultimately result in high absenteeism, high turnover rates, high stress associated with work deadlines and depression (Thompson, 2000). According to Mitroff and Denton (1991- P.91), no organization can survive for long without spirituality and soul.

Maslow’ theory gained a global fame and widely accepted to explain motivational need of human being in a growing trajectory. However, it seems to have somewhat ignored the spiritual aspect and needs which connect to the higher purpose, mystic experience and beyond personal needs. However, Maslow in his later works added ‘transcendence’ to his pyramid and brought a very important element of human growth and behavior.

As per Koltko-Rivera, M. E. (2006), it clearly shows that self-transcendence and spirituality goes beyond the satisfaction of our emotional, cognitive, aesthetic and esteem need but depends upon our internal qualities which reflects the deeper part of human development. Including self- transcendence at the top need in the hierarchy is more appropriate reflection of Maslow’s theory. It really builds and important gap and help psychology develop a better grasp of different people and culture in the organisation connect to deeper meaning and purpose. This shift provides us a theoretical tool to pursue more comprehensive understanding of human personality and behaviours.

This study on workplace spirituality adds significant contribution to enhance understanding on spiritual need of employees and strengthen the argument of next and ultimate need of self-transcendence in Maslow Theory.

There is ample scope of empirical research for scholars in the field of psychology, education, management, sociology, and behavioral science to investigate further the application of later version of this theory especially the notion of spirituality and self-actualization.

This study is exploratory in nature. It examines and explores based on systematic literature review various factors and sub factors of WPS that enables ESG. An empirical study to explore the level of relationship of factors and outcome can be done in future.

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# *From Imagination to Buying Things: Exploring the Moderation Role of Fear of Missing Out in Parasocial Relationship and Purchasing Intention*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstracts**
One of the unique research topics studied is purchasing merchandise among fandoms or communities that have specific interests, such as cartoons, anime, or celebrities. The satisfaction one gets and the feeling of happiness from being attached to one's idol is one of the factors that makes someone willing to spend money to buy idol items. This purchasing behavior has multifaceted causes, one of which is caused by parasocial relationships. Parasocial relationships are defined as socio-emotional interactions with fictional characters like cartoons, anime, or celebrities and are perceived as two-way interactions despite being one-sided. This phenomenon raises questions about when individuals experiencing PSRs may be satisfied purchasing character-related items. Therefore, this study aims to investigate the influence of parasocial relationships on purchasing intentions and the potential moderating role of FOMO among 200 early adults aged 18 to 25. Data analysis in this research employs a moderation model using Process by Hayes in SPSS 22.0. Previous studies have identified how parasocial relationships can increase individuals' intentions to buy character merchandise. The hypothesis suggests that fear of missing out can strengthen the experience of someone with an inner attachment to their idol, which will make them buy goods to support their idol. Furthermore, this research can deepen our understanding of how parasocial relationships influence the intention to purchase character-related items. This study can expand the study of fandom to maximize the potential to increase subjective well-being and happiness by looking at the uniqueness of fandoms.

Keywords: Parasocial Relationships, Parasocial Love, Parasocial Friendship, FOMO, Idol Merchandise Purchasing Intentions

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## Introduction

The fandom phenomenon has become quite a significant influence on Indonesian society today. Several unique cultures and a combination of subcultures considered cool by teenagers and adults are essential phenomena that will influence individual behaviour. This rapid growth occurs almost all over the world. It focuses on two popular cultures in Indonesia, namely Japanese Culture (J-pop, Anime, Manga and Video games) and South Korean culture (K-pop music, drama, fashion and cosmetics ) (Baudinette, 2020). The word fan refers to all people enthusiastic about particular performers, actors, books, musicians, television, and works of art. Fan behaviour refers to supportive actions done by individuals towards their idols. Despite this, the fandom context does not only focus on human celebrities but also celebrities in the form of pictures or cartoons (Abd-Rahim, 2019; Derbaix & Korchia, 2018).
This fan phenomenon has been around for a long time. Starting from childhood to old age. This behaviour also develops from time to time according to life events experienced by the individual. The phenomenon experienced by individuals when forming their liking for celebrities is caused by the development of their social identity. Several scholars state that in identity formation, several characteristics can disrupt the stability of an individual's life course. This stability can be caused by physiological changes, such as puberty or menopause, then age-graded life transitions, such as graduating from high school and transformations in commitment to essential relationships. So that when they are teenagers, individuals begin to develop a feeling of liking for the object of their fans because of the exploration of their sense of self and overall independence. This collection of fans will form the term fandom (Harrington & Bielby, 2010).

In a stable fandom, fans will form an idea practice so that it develops into a liking for their celebrity object, which will lead to consumption behaviour among the fandom (Derbaix & Korchia, 2018). Idols or the management of an idol group create a brand that will enhance the consumer behaviour of fans (Chen et al., 2021). Fans will automatically demand that they buy the product as a feeling of love for their idol (Zhang, 2017). This consumptive behaviour is supported by the characteristics of fans motivated by their emotional condition, so purchasing merchandise will generate self-pleasure and a sense of belonging to the group of fans or fandom (Zaharieva, 2022).

Before consumer behaviour occurs, there is a feeling of intention to buy it. Purchasing intention occurs due to internal and external factors that cause someone to desire to buy an item through the media. This buying behaviour is based on the influence of the internet and social media, and there are characteristics, namely trust and intrinsic evaluation, in oneself to move to buy a product (Meskaran et al., 2013). Pop culture fans tend to own merchandise owned by celebrities, virtual celebrities, or idol groups because this is one of the brands built by that celebrity group, resulting in brand recognition and persuasion, which can generate consumer behaviour in a celebrity's fandom ( Liu et al., 2020).

One of the factors that can cause someone to have purchasing intention is because there is parasocial interaction between individuals. Parasocial interaction or relationship is a social factor in which an individual forms an illusion of closeness with a celebrity, giving rise to an attachment that increases feelings of care and wanting to support the celebrity (Xiang et al., 2016). Parasocial relationships are divided into 2, namely parasocial romantic love, which is when the individual imagines his idol in the form of love or affection like a romantic partner, and parasocial friendship, which is when the individual feels friendly with his idol (Tukachinsky, 2011). Parasocial interactions will generate an intention to purchase and

increase a fan's impulsive purchases (Vazquez et al., 2020; Xiang et al., 2016). In pop culture, including fans of K-pop idols and manga or anime, interaction by viewing information, the latest album or episode, as well as concerts or exhibitions will increase fan interest and engagement, which will result in increased parasocial interaction and the tendency to purchase products issued by the brand strategy in each celebrity group (Goncalves et al., 2020).

Social media interaction is also assumed to increase parasocial interaction with fans' merchandise purchase intentions. The tendency to purchase is due to influence and word of mouth, which can insert messages into a person's subconscious mind. The messages displayed on social media and the comments therein will cause euphoria so that someone can easily be influenced to buy a product (Wagner et al., 2017; Zafar et al., 2019).

The behaviour of being afraid of missing a moment or Fear of Missing Out also occurs when there is deep interaction on social media, which explicitly makes the celebrity feel essential to the fans. Korean wave and otaku culture are often associated with someone influenced by one of them to take supportive steps towards the brand built by the celebrity. This can also increase the bandwagon effect so that fans are obsessed with merchandise made by their idol group (Aw & Labrecque, 2020; Kung, 2021; Kang & Ma, 2020).

From the background created, We propose three hypotheses, namely:

- H1:There is an influence of Parasocial Friendship Support on Idol Goods Purchase Intention
- H2:There is an influence of Parasocial Friendship Communication on Idol Goods Purchase Intention
- H3:There is an influence of Parasocial Love Physical on Idol Goods Purchase Intention
- H4:There is an influence of Parasocial Love Emotional on Idol Goods Purchase Intention
- H5:There is an influence of Fear of Missing Out on Idol Goods Purchase Intention
- H6:There is an influence of Parasocial Friendship Support on Idol Goods Purchase Intention, which is moderated by Fear of Missing Out
- H7:There is an influence of Parasocial Friendship Communication on Idol Goods Purchase Intention, which is moderated by Fear of Missing Out
- H8:There is an influence of Parasocial Love Physical on Idol Goods Purchase Intention, which is moderated by Fear of Missing Out
- H9:There is an influence of Parasocial Love Emotional on Idol Goods Purchase Intention, which is moderated by Fear of Missing Out

## Method

Collecting respondent data in this study used a convenience sampling method, meaning anyone who felt willing could fill out the questionnaire without coercion and have the right to refuse. The questionnaire was distributed using online Google Forms media. The criteria set are respondents aged 18 to 29 who like anime, K-pop, or both.

Table 1. Demographics Participant (N = 264)

| Demography | Frequency | Percentage (%) | Cumulative (%) |
|---|---|---|---|
| **Gender** | | | |
| Male | 53 | 20,1% | 20,1% |
| Female | 211 | 79,9% | 100,0% |
| Age (M = 23.96, SD = 3.08) | | | |
| **Pendidikan Terakhir** | | | |
| Secondary School | 1 | 0,4% | 0,4% |
| Highschool | 80 | 30,3% | 30,7% |
| Diploma | 12 | 4,5% | 35,2% |
| Undergraduate | 157 | 59,5% | 94,7% |
| Master Program | 12 | 4,5% | 99,2% |
| Doctoral Program | 2 | 0,8% | 100,0% |
| **Interest** | | | |
| Anime | 59 | 22,3% | 22,3% |
| K-Pop | 128 | 48,5% | 70,8% |
| Anime & K-Pop | 77 | 29,2% | 100,0% |
| **Monthly Income** | | | |
| Less than Rp500.000 | 54 | 20,5% | 20,5% |
| Rp500.000 - Rp1.000.000 | 37 | 14,0% | 34,5% |
| Rp.1.000.000 - Rp3.000.000 | 53 | 20,1% | 54,5% |
| Rp3.000.000 - Rp5.000.000 | 62 | 23,5% | 78,0% |
| More than Rp5.000.000 | 58 | 22,0% | 100,0% |
| **Monthly Expenditures for Purchasing Favorite Anime / K-Pop Merchandise** | | | |
| Less than Rp100.000 | 162 | 61,4% | 61,4% |
| Rp100.000 - Rp500.000 | 68 | 25,8% | 87,1% |
| Rp.500.000 - Rp1.500.000 | 25 | 9,5% | 96,6% |
| Rp1.500.000 - Rp3.500.000 | 7 | 2,7% | 99,2% |
| More than Rp3.500.000 | 2 | 0,8% | 100,0% |
| **Preference for purchasing location for Anime/K-Pop merchandise** | | | |
| Shopping at the Official Mall Store | 14 | 5,3% | 5,3% |
| Community Blog | 11 | 4,2% | 9,5% |
| Community Café | 6 | 2,3% | 11,7% |
| E-Commerce (Tokopedia, Shopee, Blibli, dan sebagainya) | 69 | 26,1% | 37,9% |
| Social Media (Twitter/Instagram/TikTok) | 164 | 62,1% | 100,0% |

| | | | |
|---|---|---|---|
| **Number of Watching Favorite Anime Characters/K-Pop Idols on Videos/Television/Films** | | | |
| 1 times per week | 63 | 23,9% | 23,9% |
| 2 - 3 times per week | 54 | 20,5% | 44,3% |
| 3 - 5 times per week | 43 | 16,3% | 60,6% |
| Almost Everyday | 104 | 39,4% | 100,0% |
| **Number of favorite Anime / K-Pop events or concerts that have been attended so far** | | | |
| Never had Any Event | 118 | 44,7% | 44,7% |
| 1 time | 34 | 12,9% | 57,6% |
| 2 - 3 times | 54 | 20,5% | 78,0% |
| 4 - 5 times | 23 | 8,7% | 86,7% |
| More than 5 times | 35 | 13,3% | 100,0% |
| **Have Favorited this Anime / K-Pop Character for (Years)** | | | |
| 1 - 3 years | 66 | 22,4% | 22,4% |
| 4 - 6 years | 63 | 21,4% | 43,9% |
| 7 - 10 years | 72 | 24,5% | 68,4% |
| More than 10 years | 93 | 31,6% | 100,0% |
| Total Participant | | | 264 |

This research involved 264 participants aged between 18 and 29 years (M=23.96; SD= 3.08), including those who liked K-Pop, Anime, and both. Women constitute the majority of respondents from this research, namely 79.9%. Participants also reported their last level of education, where the most were Bachelor's degrees at 59.5%, followed by high school, diploma and master's degrees at 30.3%, 4.5% and 4.5%. Information on participants' hobbies was also recorded in this research, dominated by participants who liked K-pop at 68.6%, followed by participants who liked both and Anime at 29.2%. Participants also reported monthly income; the results were Less than Rp. 500,000 as many as 54 (20.5), Rp. 66.5% of working participants dominated this research, followed by participants who had not worked as much as 33.5%. Finally, the average frequency of participants' smartphone use in a day was divided into three categories: more than 6 hours a day as much as 61%, 3-6 hours a day as much as 36.1%, and < 3 hours as much as 2.9%.

## Results

The main objective of this study is to examine whether (a) PFS will affect IGPI, (b) FOMO will affect IGPI, (c) FOMO will moderate the influence between PFS and IGPI, (d) PFC will affect IGPI, (e) FOMO will moderate the influence between PFC and IGPI, (f) PLE will affect IGPI, (g) FOMO will moderate the influence between PLE and IGPI, (h) PLP will affect IGPI, (i) FOMO will moderate the influence between PLP and IGPI. The research questions will be discussed in several stages of the study results.

***Preliminary Analysis***

Table 2 shows the mean, SD and Pearson correlation for the variables studied. The results show that higher loneliness will cause FOMO, and higher Envy will cause FOMO.

Table 2. Descriptive statistics and the matrix relationship between variables

| | M | SD | PFS | PFC | PLE | PLP | FOMO | IGPI |
|---|---|---|---|---|---|---|---|---|
| **PFS** | 1.19 | 2.03 | - | | | | | |
| **PFC** | 0.726 | 1.73 | 0.671*** | - | | | | |
| **PLE** | 0.628 | 1.85 | 0.727*** | 0.552*** | - | | | |
| **PLP** | 4.46 | 3.10 | 0.415*** | 0.362*** | 0.629*** | - | | |
| **FOMO** | - 0.823 | 1.29 | 0.264*** | 0.205*** | 0.390*** | 0.257*** | - | |
| **IGPI** | 0.232 | 2.29 | 0.539*** | 0.399*** | 0.545*** | 0.380*** | 0.289*** | - |

Note: N= 264. *=p < 0.05, **=P < 0.01, ***=P < 0.001

*Regression and Moderation Test between variables*

Table 3. Regression Variable to IGPI

| No | Model | IGPI |
|---|---|---|
| | | **B** |
| 1 | PFS | 0.297*** |
| 2 | PFC | 0.024 |
| 3 | PLE | 0.265** |
| 4 | PLP | 0.081 |
| 5 | FOMO | 0.289 |

PFS= Parasocial Friendship Support; PFC= Parasocial Friendship Communication; PLE= Parasocial Love Emotional; PLP= Parasocial Love Physical; FOMO= Fear of Missing Out; IGPI; Idol Goods Purchasing Intention; Model 1= PFS; Model 2= PFS, PFC; Model 3= PFS, PFC, PLE; Model 4= PFS x PFC x PLE, PLP; *=P<0.05; **=P<0.01; ***=p<0.001

The regression analysis results in table 3 show that the PFS variable influences IGPI in the context of moderator regression ($\beta = 0.297$, $p < a$). And, PLE variable also has an effect on IGPI ($\beta = 0.265$, $p < a$) with the multiple regression both variables have effect on IGPI. But, PFC ($\beta = 0.024$, $p > a$) and PLP ($\beta = 0.081$, $p > a$) variable do not have effect on IGPI. Therefore, the findings support only hypothesis 1.

When tested by adding the interaction between 4 dimensions of PSR and IGPI, tidak terdapat interaksi moderasi yang signifikan antara semua dimensi PSR dan IGPI. In conclusion, when

FOMO becomes a moderator maka tidak terjadi moderasi antara 4 dimensi PSR terhadap IGPI; therefore, hypothesis 3 is not proven.

## Discussion

This study proves two of the three hypotheses. The variable examined in this study is the intention to purchase. This research limits the intention to purchase to the population of pop culture fans, especially those with the most extensive fan base. 2 pop cultures are developing in Indonesia, namely Korean pop culture, such as idol groups or music bands. Then, Japanese pop culture focuses on manga, anime and idol groups. The phenomenon seen in this research was examined by purchasing merchandise among this fan group.

Hypothesis 1 in this research is that there is an influence of parasocial interaction on purchase intention. This research found that parasocial interactions with celebrities or idol groups, with the type of parasocial in the form of love or parasocial in the form of friendship, will increase purchase intention. Several studies have found related to this hypothesis. In one study, it was found that social interaction had a positive effect on purchase intention; this was due to the feeling of envy and comparison shown to the idol group, so there was a particular emotional attachment (Purwanto, 2021). This also agrees with other research, which states that engagement with viewers or followers can strengthen parasocial interaction and purchase intention (Lee & Lee; Shen et al., 2022).

Then, hypothesis 2 in this research wants to find the influence of Fear of Missing Out on purchase intention. In this research, it was found that fear of missing out will increase purchase intention. One study explains that the fear of missing out on purchasing goods is caused by the individual's tendency to socially compare what happens to them (Blasé et al., 2023; Purwanto, 2021). Fomo will create anxiety and fear of being left behind by what is being updated, including when the idol group releases merchandise (Good & Hyman, 2021).

Then, to answer hypothesis 3 in this research, namely FOMO as a moderator or strengthening or weakening the influence between parasocial interaction and purchase intention. In this research, FOMO does not moderate parasocial interaction, namely love and friendship. This could be because individuals aged 18-29 years already have good enough self-control so that FOMO does not become one of the criteria for someone to purchase merchandise to the point of impulsive buying (Fumar et al., 2023).

One of the limitations of this research is that not much has been studied in depth regarding merchandise purchases among pop culture lovers or fans, so the reference material is relatively small and needs to be deepened. Second, there are possible differences between Korean pop and Japanese pop fanbases that need to be separated to help researchers see the dynamics of the differences between fans in the two cultures. Third, the fans in this study were aged 18-29 years, where the formation of identity in fan culture occurs during adolescence, ranging from 11 to 17 years.

## Conclusion

It can be concluded that this research can add to the scientific knowledge of PSR, FOMO and IGPI research. The results showed no moderation effect between PSR and IGPI when moderated by FOMO. However, the correlation results between variables show correlations with high significance between all variables. Suggestions for future research development

could be to conduct research by looking at the intention to purchase idol goods as a predictor of parasocial relationships, which FOMO moderates. Then this research is also limited to adults and has not explored teenagers who are currently searching for identity and looking for role models. Therefore, further research can take samples from teenagers to obtain comprehensive results related to this parasocial relationship phenomenon.

## Acknowledgements

The author is awardee LPDP would like to thank LPDP Scholarship provided by the Indonesian Ministry of Finance for being the primary source of funding for this research without them this research almost impossible to be done.

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# *From Screens to Souls: Parasocial Relationship, Belongingness, and Zest for Life Among Emerging Adulthood K-pop Fans*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
In the era of technological advances and widespread internet use, forming parasocial relationships, those one-sided connections with admired figures like Korean celebrities, have become effortlessly accessible. These relationships often play a pivotal role in enhancing individuals' zest for life - enthusiasm and energy to live. While past research has delved into parasocial relationships and belongingness, there remains an unexplored territory: the relationship between parasocial relationships and zest for life, with belongingness as the mediator. This study endeavors to bridge this gap by involving 182 K-pop fans (aged 18-29 years old), acknowledging the profound influence of K-pop's popularity and the prevalence of parasocial relationships within this fan community. Moreover, emerging adulthood is characterized by a fundamental need to build intimate relationships, making it a critical stage for investigating how parasocial relationships may affect overall well-being. Data analysis for this research will use Model 4 of the Hayes PROCESS for SPSS 27. The research findings reveal a significant direct effect of Parasocial Friendship Communication and Parasocial Friendship Support on the zest for life among emerging adulthood K-Pop fans. Interestingly, both Physical and Emotional forms of Parasocial Love do not demonstrate a significant direct effect. Furthermore, belongingness does not appear to act as a mediator between parasocial relationships and zest for life. These findings will contribute not only to our understanding of this unique fan culture but also to the broader exploration of one-sided relationships in the digital age. As we navigate the ever-evolving landscape of fan interactions in the digital era, this study offers a glimpse into how the virtual bonds forged between fans and their idols can have a tangible impact on their overall enthusiasm for life.

Keywords: Parasocial Relationship, Belongingness, Zest for Life, Korean Pop Fans

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## 1. Introduction

In the past two decades, Korean culture has spread to various countries. The diffusion of Korean popular culture encompasses various aspects, ranging from dramas, music, to lifestyle. This phenomenon is known as the "Korean Wave" or "Hallyu". The Korea Foundation (2022) states that the number of Hallyu fans worldwide has reached 178.8 million people. This figure has increased 19 times compared to 2012. This demonstrates that the "Hallyu" phenomenon has gained broad acceptance among people worldwide, including in Indonesia.

The dominance of Korean Pop music, or K-Pop, is one of the most prominent aspects of the Hallyu phenomenon. K-Pop music, characterized by its unique musical style and spectacular stage performances, has achieved significant global popularity. K-Pop groups and solo artists from South Korea have managed to capture the attention of fans worldwide, forming a strong and diverse fan base. According to CNN Indonesia (2022), Indonesia is the country with the largest K-Pop fanbase in the online world. Indonesia is also noted as the country that discusses K-Pop the most on the Twitter platform, reaching 7.5 billion tweets related to K-Pop (Javier, 2021). This position is followed by the Philippines, South Korea, and Thailand.

According to the IDN Times survey (Triadanti, 2019), 40.7% of K-Pop fans in Indonesia are aged 20-25 years, 38.1% are aged 15-20 years, 11.9% are over 25 years old, and 9.3% are aged 10-15 years. From the survey results, it is evident that the majority of K-Pop fans come from the emerging adulthood age range, i.e., 18-29 years old. The emerging adulthood stage is a phase with the task of establishing intimate relationships with others. If individuals do not fulfill this stage, it can result in feelings of isolation from their environment and potentially disrupt their psychological well-being (Arnett, 2014; Santrock, 2006).

Koreaboo (2024) recently shared stories of several netizens who credited their idols for saving them from deep depression and suicidal thoughts. The idols igniting a zest for life within them. Despite recent struggles with isolation and social issues, they find solace and strength in their idols' support, acknowledging they would not be alive today without them. These testimonies underscore the profound impact idols can have on their fans' mental health and well-being, serving as beacons of hope and inspiration in challenging times.

Collins et al. (2016) define zest for life as the desire to live that emerges as a feeling of engagement in life and a positive outlook on life. According to Peterson et al., (2007), individuals with a strong zest for life typically experience heightened activation and motivation in their daily activities. This zestful outlook has been associated with decreased feelings of anxiety and boredom. However, as noted by George et al. (2020), zest for life may diminish when desires for belonging remain unfulfilled, highlighting the interconnectedness between belongingness and one's zest for life.

Zest for life is crucial for individuals to develop adaptive coping mechanisms. Moreover, it maintains the feeling that life is worth living, even when an individual feels pressured or unpleasant. As an individual's zest for life increases, disturbances like depression decrease (Lam, 2020). Furthermore, Shahram et al. (2021) discovered that zest for life appears to act as a protective factor against suicide among young individuals and is linked to traits of resilience.

Concurrently, the relationship between K-Pop and its fans has given rise to parasocial relationships, which are deeply embedded in fan culture. Parasocial relationships refer to one-sided relationships formed by individuals with media figures, such as celebrities or idols (Horton & Wohl, 1956). These parasocial relationships are characterized by feelings of closeness, emotional attachment, and identification with idols, even without reciprocal interaction (Dibble et al., 2015). Fans engage in parasocial relationships by following their idols' activities, enjoying their music and content, and participating in fan communities both online and offline (Purwaningtyas & Oktara, 2023). The phenomenon of parasocial relationships has become an essential aspect of K-Pop fans' lives, depicting how fans feel an emotional connection with their idols, as if they have a personal relationship with them.

Tukachinsky (2011) divides parasocial relationships into two dimensions: Parasocial Friendship (PSF) and Parasocial Love (PSL). Parasocial Friendship (PSF) is the imagined support and closeness one would experience if the media character were real. Parasocial Friendship consists of two factors. The first factor of friendship centers on communication themes like disclosure and seeking advice. The second factor of friendship is defined by themes of support and companionship, encompassing trust, sharing, and mutual assistance. Next, the second dimension is parasocial love (PSL) refers to feelings of affection and physical attraction towards the media character. Parasocial Love is divided into two factors: physical attraction and a deep emotional response to the character (e.g., admiration, mood alteration).

Parasocial relationships are often associated with negative impacts on individuals such as loneliness, depression, and low self-esteem due to comparisons between individuals and their idols (Baek et al., 2013; Hoffner & Bond, 2022). However, on the other hand, parasocial relationships potentially contribute to enhancing an individual's well-being. This is because of the feeling of connection with idols, which could potentially fulfill an individual's need for belongingness. This phenomenon can be explained by the social surrogacy theory, which suggests that individuals can develop meaningful bonds with media figures. These connections can act as substitutes for real social relationships. Thereby fulfill their belongingness needs (Derrick et al., 2009).

Belongingness involves feeling accepted, respected, and supported by one's environment. It stems from the need-to-belong theory where individuals strongly desire to form and maintain close and enduring relationships with others (Baumeister & Leary, 1995; Gao et al., 2017). When individuals lack belongingness, it can lead to pathologies such as depression, loneliness, and social anxiety (Baumeister & Leary, 1995; Moeller et al., 2020). Meanwhile, McAdams and Bryant (as cited in Moeller et al., 2020) found that belongingness significantly contributes to human well-being and happiness. This indicates that belongingness is a crucial aspect for individuals to possess.

Building on the preceding discussion, this research aims to examine the relationship between parasocial relationships and zest for life, with belongingness as a mediator, among K-Pop fans in the emerging adulthood age group. While previous studies have explored the connection between parasocial relationships and belongingness (Derrick et al., 2009), and indicated that zest for life may diminish when the need for belongingness remains unmet (George et al., 2020). There is a gap in the literature regarding the relationship between parasocial relationships, belongingness, and zest for life among emerging adulthood-aged K-Pop fans. Hence, this study aims to bridge this knowledge gap.

## 1.1. Research Hypothesis

This study aims to examine the effect of the independent variable (parasocial relationship) on the dependent variable (zest for life). Furthermore, the analysis is conducted to determine whether the variation in the relationship between the two variables is influenced by the mediator variable (belongingness). Based on this description, the hypotheses proposed in this study are:

H1: There is an influence of parasocial relationships on Zest for Life (ZFL) among participants mediated by belongingness.
H2: There is a direct or indirect influence of parasocial friendship communication on ZFL.
H3: There is a direct or indirect influence of parasocial friendship support on ZFL.
H4: There is a direct or indirect influence of parasocial love physical on ZFL.
H5: There is a direct or indirect influence of parasocial love emotional on ZFL.

The following is the interaction model among the variables in this study, which will help us understand how the parasocial relationship with K-Pop idols can affect belongingness and subsequently influence the zest for life of individuals in the emerging adulthood age group.

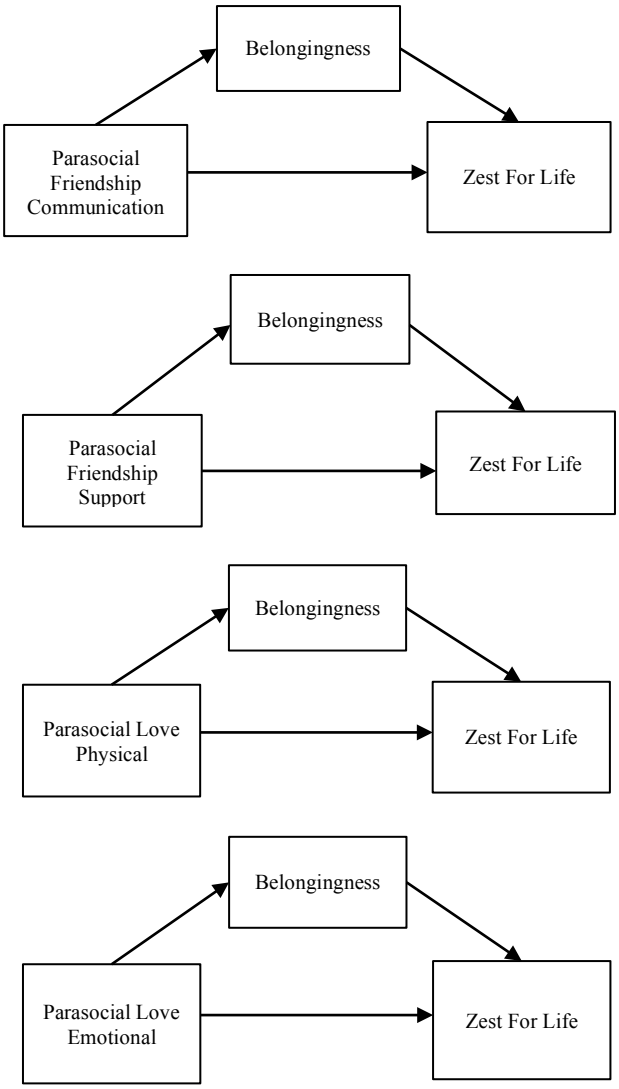



Figure 1. Interaction Model

## 2. Method

### 2.1 Participant and Research Design

This research employed a quantitative survey method utilizing purposive sampling as the chosen sampling technique. The participants in this study met the criteria of (a) being between the ages of 18-29 and (b) having an interest in K-Pop. The rule of thumb utilized to determine the minimum sample size is as follows: 150 - 315 respondents (Muthén & Muthén, 2002). Initially, 205 individuals completed the questionnaire; however, after screening for alignment with the research criteria, a total of 182 participants were found eligible. According to this rule of thumb, the minimum number of respondents for conducting hypothesis testing in this study exceeds the prescribed threshold.

### 2.2. Instrumentation

In this study, three measurement tools were used: the multiple parasocial relationship scale, need to belong scale, and zest for life scale. Validity testing was conducted using the Confirmatory Factor Analysis (CFA) method. In determining model fit, several common fit statistics and indices were utilized, including Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), and Standardized Root Mean Square Residual (SRMR). The standards used to assess model adequacy are RMSEA<0.08, SRMR<0.08 (Furr & Bacharach, 2013), and also CFI>0.9, TLI>0.9 (Schumaker & Lomax, 2016). JASP software version 0.18.1.0 with the maximum likelihood estimation method was used in conducting this analysis.

#### *2.2.1 Parasocial Relationship*

The measurement of parasocial relationships utilized the Multiple Parasocial Relationship Scale (Tukachinsky, 2011). MPSR consists of 24 items assessed on a 5-point Likert scale ranging from Strongly Disagree to Strongly Agree. The M-PSR encompasses two dimensions: Firstly, parasocial friendship, comprising two factors — parasocial friendship communication and parasocial relationship support. Secondly, parasocial love, consisting of two factors — parasocial love physical and parasocial love emotional. In this study, the M-PSR exhibited satisfactory psychometric properties. The Confirmatory Factor Analysis (CFA) indicated an acceptable fit of the scale model: RMSEA = 0.074, CFI = 0.909, TLI = 0.895, and SRMR = 0.076. The Cronbach's α coefficient for this scale in this study was 0.930.

#### *2.2.2 Belongingness*

The measurement of belongingness utilized the Need to Belong Scale (Leary et al., 2013). NTB consists of 10 items assessed on a 5-point Likert scale ranging from Not at all to Extremely. The NBS has been found to have satisfactory psychometric properties in this study. The index of CFA showed an acceptable fit of the scale model: RMSEA =0.073, CFI =0.934, TLI =0.910, and SRMR =0.059. The Cronbach's α coe□cient of this scale in this study was 0.807.

### *2.2.3 Zest for Life*

The measurement of zest for life used the Zest for Life Scale (George et al., 2020). ZLS consists of 12 items assessed on a 9-point Likert scale ranging from 0 (not at all) to 8 (very much). ZLS encompasses two dimensions: (a) general zest, which includes a general desire for life and a positive outlook on life, and (b) engagement, reflecting current involvement in life. The ZFL has been found to have satisfactory psychometric properties in this study. The index of CFA showed an acceptable fit of the scale model: RMSEA =0.079, CFI =0.959, TLI =0.948, and SRMR =0.51. The Cronbach's α coe□cient of this scale in this study was 0.874.

## 2.3 Data Analysis

The collected data will be analyzed using various software tools. Firstly, JASP software version 0.18.1.0 will be utilized with the maximum likelihood estimation method to process the instrumentation analysis. Subsequently, SPSS version 27.0 will be employed for descriptive statistical testing and correlation analysis. Finally, the researcher will utilize the PROCESS macro model 4 (Hayes, 2017) to investigate the presence of a direct effect between parasocial relationships and zest for life, as well as to explore the potential mediation of belongingness between parasocial relationships and zest for life.

## 3. Result

The results of this study are divided into four parts: (1) participant demographic information in the study, (2) descriptive statistics, (3) direct effects between variables, and (4) indirect effects between variables.

Table 1. Demographic Data of Research Participants (N = 182)

| *Demography* | | *N* | *Percentage* |
|---|---|---|---|
| Gender | Male | 15 | 8.2% |
| | Female | 167 | 91.8% |
| Age | 18 | 9 | 4.9% |
| | 19 | 11 | 6.0% |
| | 20 | 6 | 3.3% |
| | 21 | 10 | 5.5% |
| | 22 | 12 | 6.6% |
| | 23 | 28 | 15.4% |
| | 24 | 31 | 17.0% |
| | 25 | 21 | 11.5% |
| | 26 | 10 | 5.5% |
| | 27 | 20 | 11.0% |
| | 28 | 11 | 6.0% |
| | 29 | 13 | 7.1% |
| Education level | High School/Vocational High School | 55 | 30.2% |
| | Diploma | 10 | 5.5% |
| | Undergraduate | 110 | 60.4% |
| | Graduate | 10 | 5.5% |
| Domicile | Sumatera | 10 | 5.5% |
| | Kalimantan | 12 | 6.6% |
| | Java | 149 | 81.9% |

| *Demography* | *N* | *Percentage* |
|---|---|---|
| Sulawesi | 4 | 2.2% |
| Papua & Nusa Tenggara | 7 | 3.8% |

The results in Table 1 indicate that the majority of participants in this study were female (91.8%), aged between 23 and 24 years old (15.4% and 17% respectively), their highest education level were undergraduate (60.4%), and the majority residing in the Java Islands (81.9%).

Table 2. Descriptive Statistics

| Variable | M | SD | Pearson Correlations | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 |
| 1. PSF_Com | 17.34 | 4.37 | — | | | | | |
| 2. PSF_Sup | 25.54 | 5.47 | -.573** | — | | | | |
| 3. PSL_Phy | 21.95 | 2.72 | -.268** | .278** | — | | | |
| 4. PSL_Emo | 24.20 | 5.93 | .360** | -.423** | -.276** | — | | |
| 5. Belonging | 32.00 | 6.09 | .103 | -.116 | -.117 | .124 | — | |
| 6. Zest for Life | 71.73 | 15.59 | -.157* | .169* | .115 | -.097 | -.125 | — |

Note: *p<0.05 , **p<0.01.

The tables above present detailed descriptive information regarding the mean (average) values, standard deviation (a measure of data dispersion), and correlations of each variable. This information aims to provide a more comprehensive understanding of the characteristics and variability of each element studied in this research. In correlations, it was found that some variables correlate significantly, but there are also some variables that show non-significant correlations.

Table 3. Direct Effect Between Variables

| *Path* | *B* | *S.E* | *Z-Value* | *β* | *p* | $R^2$ | *Note* |
|---|---|---|---|---|---|---|---|
| PSF_Com → ZFL | -.143 | .072 | -2.00 | -.146 | .049 | .037 | Significant |
| PSF_Sup → ZFL | .153 | .072 | 2.14 | .157 | .035 | .040 | Significant |
| PSL_Phy → ZFL | .101 | .074 | 1.38 | .102 | .172 | .026 | Not significant |
| PSL_Emo → ZFL | -.078 | .071 | -1.12 | -.082 | .270 | .022 | Not significant |

Based on the table above, it can be seen that there is a direct effect on parasocial friendship, while there is no direct effect on parasocial love. First, the parasocial friendship communication variable has a negative significant influence on the ZFL. This can be seen from the value of z-value = -2.00 ($z > 1.96$). Second, the parasocial friendship support variable has a positive significant influence on the ZFL. This can be seen from the value of z-value = 2.14. Third, the parasocial love physical variable has non-significant influence on the ZFL. This can be seen from the value of z-value = 1.38. Lastly, the parasocial love emotional variable has non-significant influence on the ZFL. This can be seen from the value of z-value = -1.12.

Table 4. Indirect Effect Between Variables

| *Path* | *B* | *S.E* | *Z-Value* | *95% CI* | *Note* |
|---|---|---|---|---|---|
| PSF_Com → B → ZFL | -.011 | .010 | 1.02 | (-.044, .008) | Not significant |
| PSF_Sup → B → ZFL | -.012 | .011 | 1.07 | (-.007, .046) | Not significant |
| PSL_Phy → B → ZFL | -.013 | .011 | 1.10 | (-.006, .049) | Not significant |
| PSL_Emo → B → ZFL | -.013 | .011 | -1.14 | (-.047, .006) | Not significant |

Based on Table 4 above, the interaction between parasocial relationships and enthusiasm for life which is mediated by belongingness is not significant. First, the parasocial friendship communication variable has non-significant influence on the ZFL through the mediator variable belongingness. This can be seen from the value of z-value = 1.02. Second, the parasocial friendship support variable has non-significant influence on the ZFL through the mediator variable belongingness. This can be seen from the value of z-value = 1.07. Third, the parasocial love physical variable has non-significant influence on the ZFL through the mediator variable belongingness. This can be seen from the value of z-value = 1.10. Lastly, the parasocial love emotional variable has non-significant influence on the ZFL through the mediator variable belongingness. This can be seen from the value of z-value = -1.14.

## 4. Discussion

This research aims to investigate the relationship between parasocial relationships and zest for life among K-Pop fans. Furthermore, it explores whether belongingness plays a mediating role in this relationship. Upon analysis, the final model illustrating these connections can be observed in Figure 2.

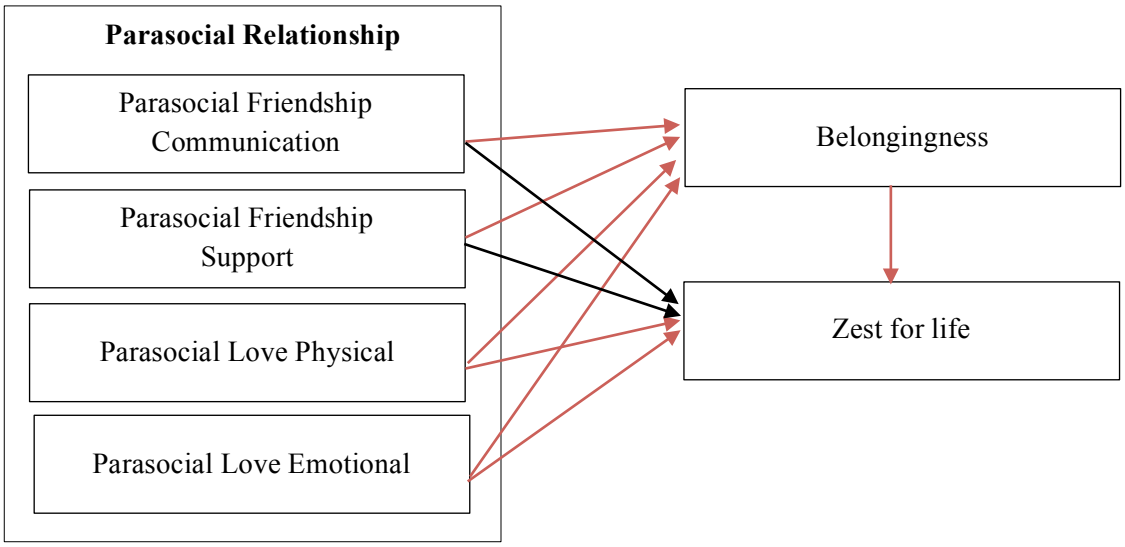



Figure 2. Final Model

(*Note: Red Line= Not significant; Black Line= Significant*)

The study's findings highlight a significant direct impact of Parasocial Friendship Communication (PSF Communication) and Parasocial Friendship Support (PSF Support) on the zest for life among K-Pop fans. Interestingly, PSF Communication exhibits a noteworthy negative influence, while PSF Support demonstrates a positive effect on zest for life. These outcomes are explained by the dynamics of these interactions. The negative impact of PSF Communication could be attributed to the unmet expectations associated with seeking advice, attempting to open up, and desiring direct communication. When these expectations remain

unfulfilled, it may lead to dampening individual enthusiasm for life. As highlighted by Bi and Wang's study (2021), positive communication patterns, characterized by openness and ease of interaction, have been consistently linked to increased life satisfaction, while challenging communication has been correlated with lower levels of satisfaction.

Conversely, the positive impact of PSF Support likely arises from the affirming and constructive aspects found in supportive relationships. There's a sense of contentment in providing support to others (Hu et al., 2021; Laffan, 2020), even in the absence of face-to-face interactions, which lead to individual zest for life. This is particularly evident in the passionate support exhibited by fans towards their K-pop idols. Despite physical distance and limited personal interaction, the bond between fans and idols often serves as a source of encouragement and inspiration. Directly contributing to the well-being of fans and the continued popularity success of K-pop artists in the global entertainment industry.

In this study, both physical and emotional parasocial love did not demonstrate a significant direct effect. This supports Tukachinsky's findings (2011), suggesting that adolescents may report higher levels of parasocial love compared to older adults. On the contrary, older adults tend to develop higher levels of para-friendship than adolescents. This could be attributed to earlier research, Karniol (2001) proposing that individuals might form affectionate connections with fictional characters or personas during adolescence to shape their personal identities, prepare for their sexuality, and integrate into peer culture. Consequently, teenagers might be more predisposed to developing feelings of affection towards individuals that aren't purely romantic - a phenomenon known as parasocial love. Moreover, studies indicate that the peak of celebrity idolization (admiration and imitation) occurs during early adolescence and diminishes with age (Raviv et al., 1996). Therefore, it would be intriguing to examine parasocial relationships, belongingness, and zest for life among teenagers.

This study found that belongingness does not act as a mediator in the relationship between parasocial relationships and zest for life. This phenomenon could occur because in Indonesia, as a collective country, the sense of belonging primarily originates from real-life communal interactions. If these interactions are communal and available face-to-face interactions, there might be a possibility belongingness mediate this relationship. Furthermore, according to Chaturvedi et al., (2015), when individuals have a moderate need to belong, it may lead to reduced online interactions, such as parasocial relationships. This happens as individuals feel their belonging needs are already fulfilled through face-to-face relationships in the real world (Baumeister & Leary, 1995). Consequently, belongingness did not mediate the relationship between parasocial relationships and zest for life. Furthermore, it is crucial to explore the sense of belonging within fandom groups, an area that remains largely unexplored. Kim and Kim (2017) suggested that K-Pop culture might offer individuals a sense of belonging in online K-Pop fan community groups. However, current research has not thoroughly examined this aspect.

Nevertheless, this study provides important initial information regarding the role of parasocial relationship to zest for life in emerging adulthood. Furthermore, the findings of this research will contribute not only to our understanding of this unique fan culture but also to the broader exploration of one-sided relationships in the digital age. As we navigate the ever-evolving landscape of fan interactions in the digital era, this study offers a glimpse into how the virtual bonds forged between fans and their idols can have a tangible impact on their overall enthusiasm for life.

## 5. Limitation and Future Research

This study has several limitations. Firstly, the primary limitation lies in the fact that the majority of participants were female. This could potentially introduce gender bias into the findings. Future studies should aim for a more balanced gender representation to ensure broader generalizability. Secondly, this research did not differentiate participants based on their involvement or non-involvement in the community, which might affect their belonging. Future research could focus on how parasocial relationships, the sense of belonging within the K-Pop community influences members' zest for life. Moreover, future research could explore how parasocial relationships impact zest for life during adolescence. Given the potentially stronger influence of parasocial relationships during adolescence and the uncertainties of this developmental phase that can impact one's zest for life during this phase. Investigating this relationship could offer valuable insights.

## 6. Conclusion

The research findings reveal a noteworthy direct effect of Parasocial Friendship Communication and Parasocial Friendship Support on the zest for life among emerging adulthood K-Pop fans. Interestingly, both Physical and Emotional forms of Parasocial Love do not demonstrate a significant direct effect. Furthermore, belongingness does not appear to act as a mediator between parasocial relationships and zest for life. Nevertheless, this study serves as a critical initial exploration shedding light on the influence of parasocial relationships in shaping the zest for life during the phase of emerging adulthood.

## Acknowledgement

The participation to present the abstract at IAFOR 2024 has been made possible through the support of the LPDP Indonesian Ministry of Finance Scholarship Fund and Universitas Gadjah Mada. Sincere appreciation is extended to Meylisa Permata Sari, M.Sc for her invaluable insights and support throughout this research journey. Additionally, heartfelt gratitude is expressed to all study participants for their invaluable contributions and unwavering dedication in completing this research.

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# *Coping Strategies and Fatigue Among Undergraduate Students*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
This research aims to study and compare the differences of coping strategies and fatigue among undergraduate students. The sample included 345 individuals who were selected using a stratified random technique. Quantitative data was obtained using fatigue and coping strategy questionnaires. Qualitative data was gathered through a focus group method with 12 individuals to explore how they cope with fatigue. Descriptive statistics and One-way ANOVA were used to analyze the data. In terms of qualitative data, interconnected data were classified together in the same category. The findings revealed fatigue among undergraduate students was moderate overall. The students relied mostly on the following coping strategies: problem-focused, avoidance, and seeking information or reference to others, respectively. When the fatigue was compared depending on the students' coping strategies, students who preferred avoidance had levels of fatigue higher than those who preferred seeking information or reference from others, and problem-focused, respectively. Data from focus groups revealed that students dealt with fatigue in a variety of ways, including focusing on the roots of the problem, seeking a mental refuge, consulting a professional when required, taking a break to relax, and avoiding the problems entirely. As a result, practicing positive strategies can help to reduce fatigue and promote well-being.

Keywords: Coping Strategies, Fatigue, Undergraduate Students

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## Introduction

University students play a pivotal role in national development, actively engaged in acquiring, applying, and refining their knowledge and skills (Hoidn & Kärkkäinen, 2014). Mental health stands as a critical determinant of effective learning and personal development. The advent of the COVID-19 pandemic, characterized by intermittent disruptions and the emergence of new variants, has led to significant changes in students' lives, demanding considerable adaptability (Ding & Zhang, 2020; Bountress et al., 2022; Gupta et al., 2023). A noteworthy paradigm shift from traditional on-site classes to online learning has become the predominant mode, thereby disrupting the conventional university experience (Maqsood et al., 2021).

As per the 2021 report from the Department of Mental Health, students exhibit heightened stress levels, with 29.29% reporting elevated stress and 16.67% grappling with fatigue or burnout in their academic pursuits. Notably, this stress-to-fatigue ratio among students surpasses that observed in adults with high level and by approximately threefold (Kizhakkeveettil et al., 2017). Maslach and Jackson's seminal work in 1986 categorizes fatigue into three types: 1) Emotional Fatigue, characterized by a sense of exhaustion and an aversion to work or study; 2) Depersonalization, a symptom arising subsequent to emotional fatigue, resulting in a negative attitude towards peers and social associates; 3) Lack of Personal Accomplishment, where individuals perceive falling short of expectations, leading to negative self-evaluation and a perceived deficiency in problem-solving skills. These three types of fatigue markedly hinder students' productivity in both academic and professional domains. As a result, chronic stress emerges as a central precursor to fatigue, potentially giving rise to a range of mental health issues, notably including depression. This report seeks to systematically examine and comprehend the nuanced interconnections between stress, fatigue, and mental health challenges among university students (Mariotti, 2015), specifically in the context of the shifting dynamics brought about by the COVID-19 pandemic, encompassing both the periods of remote and on-site learning (Ding & Zhang, 2020; Prowse et al., 2021; Bountress et al., 2022).

An additional life skill that merits attention for students in mitigating fatigue is the adoption of coping strategies (Klonoff-Cohen, 2022). Lazarus and Folkman (1984a) provide a comprehensive definition of coping strategies, characterizing them as a dynamic process by which individuals endeavor to master or diminish stressors and life challenges. This multifaceted process is expressed through behavioral manifestations encompassing the regulation of thoughts and emotions, ultimately aimed at mitigating stress and addressing prevalent problems. Lazarus and Folkman ((1984a; 1984b) delineate coping strategies into three distinct categories. First, Problem-Focused Coping entails directly confronting stressors, allowing students to methodically break down tasks, set realistic goals, and actively seek solutions to academic or personal challenges. This approach empowers students, fostering a sense of control that has the potential to reduce stress and prevent the onset of fatigue. Secondly, Seeking Support from Others involves reaching out to friends, family, or professionals for emotional reassurance and practical assistance during challenging times. Encouraging students to cultivate a robust support network is integral, fostering a profound sense of connectedness that can effectively alleviate stress. Lastly, Avoidance Coping seeks to minimize exposure to stressors through distraction or deliberate avoidance of anxiety-inducing situations. While providing momentary relief, it is crucial to note that avoidance coping may lack sustainability and could contribute to long-term stress (Sirois, 2023). Understanding the nuances of these coping strategies is imperative for guiding students

toward more adaptive alternatives, steering them away from less effective coping mechanisms, and nurturing their overall well-being (Erschens et al., 2018; Van der Walt et al., 2019).

The impartation of life skills, coupled with an education on effective coping strategies, holds profound significance for students (Townsend, 2014; Alborzkouh et al., 2015). Advising students to employ strategies such as problem-solving or seeking professional support is crucial, surpassing the approach of allowing them to grapple with challenges and potential exhaustion through self-devised, inappropriate, or ineffective strategies (de Wit & Deca, 2020). Recognizing this, the researchers posit a hypothesis that undergraduate students, in their diverse academic and personal contexts, employ coping strategies to navigate and alleviate fatigue.

To comprehensively investigate this hypothesis, quantitative data collection was employed through the utilization of a focus group method. This methodological choice ensures a more nuanced understanding of how coping strategies are practically applied by students in real-world scenarios, offering valuable insights into the dynamic interplay between coping strategies and the experience of fatigue among undergraduate students. In essence, this research seeks to contribute to the broader discourse on student well-being, shedding light on the efficacy of coping mechanisms in the face of academic and personal challenges, particularly within the context of the evolving landscape brought about by the COVID-19 pandemic.

With the objective of understanding how students navigate challenges using various coping strategies, this research aims to create a model for mental health development specifically designed for Chiang Mai University students. Furthermore, it endeavors to develop a proactive plan to aid students in dealing with fatigue, promoting their adaptation and effective problem resolution. The study is closely aligned with the field of counseling psychology within the university setting, underscoring the notion that prevention is more advantageous than an exclusive focus on treatment.

## Methods

### *Procedure*

This study enrolled undergraduate students from Chiang Mai University who met the following criteria: undergraduate status, aged between 18 and 25 years old, proficient in reading, listening, and writing. Participants were required to be willing and independent in their participation in the research.

### *Participants*

For Study 1, a sample size of 345 individuals was determined using the G*Power program. Study 2 comprised a Focus Group consisting of 12 participants. Qualitative data were collected from volunteers recruited through online public relations channels.

## Measures

### *Study 1: Quantitative Methodology*

In the quantitative phase, the Checklist Individual Strength Questionnaire (CIS), adapted from Worm–Smeitinka et al. (2017), was utilized. Additionally, a Fatigue Scale was developed based on the conceptual framework proposed by Maslach and Jackson (1986a),

encompassing four dimensions: Subjective Fatigue, Reduction in Activity, Reduction in Concentration, Reduction in Motivation. Each dimension comprises 17 items, and the overall reliability, assessed by Cronbach's alpha, stands at a commendable level of .894.

***Study 2: Qualitative Methodology (Focus Group)***

Study 2, a Focus Group methodology was employed. Group discussions were conducted to comprehensively explore and understand how students utilize coping mechanisms to address both problems and fatigue.

***Statistical Analysis***

Descriptive statistics summarized general data, while group differences were assessed with One-Way ANOVA and Scheffe method for pairwise comparisons. Focus group outcomes were carefully analyzed through content categorization.

## Results

***Study 1***

In the study sample, the majority identified as female, comprising 272 individuals (78.8%). Among them, 213 students (61.7%) reported moderate fatigue, while 99 students (28.6%) reported high fatigue (Table 1). Problem-focused coping was the most common, with 155 individuals (44.9%) using this approach. Additionally, 113 students (32.8%) employed avoidance coping, while 77 students (22.38%) sought reference from others (Table 2).

Table 1. Number and percentage of students categorized based on their level of fatigue

| **Levels of Fatigue** | *n* | % |
|---|---|---|
| Low | 33 | 9.5 |
| Moderate | 213 | 61.7 |
| High | 99 | 28.6 |

Table 2. Number and percentage distribution across coping methods

| **Coping Strategies** | *n* | % |
|---|---|---|
| Problem-focused | 155 | 44.9 |
| Seeking reference from others | 77 | 22.3 |
| Avoidance | 113 | 32.8 |

Table 3. Displays the minimum, maximum, mean, and standard deviation differences between the utilization of coping strategies and levels of fatigue

| **Coping strategies** | Fatigue | | | |
|---|---|---|---|---|
| | Min | Max | Mean | S.D. |
| Problem-focused | 1.00 | 5.82 | 3.90 | .910 |
| Reference to others | 1.59 | 6.47 | 4.24 | .922 |
| Avoidance | 3.71 | 6.94 | 5.24 | .676 |

According to Table 3 indicates that students who favored avoidance coping exhibited higher levels of fatigue compared to those who preferred seeking reference to others and problem-focused coping strategies.

The Levene test confirmed a significant correlation in standard deviation, supporting the hypothesis. One-Way ANOVA analysis revealed differing levels of fatigue among students employing different coping strategies, significant at the 0.05 level. Post hoc analysis with the Scheffe method identified differences in coping strategies between each pair.

Table 4. The pairwise comparison of students' fatigue levels using the Scheffe method

| Coping strategies | | Problem-focused | Reference to others | Avoidance |
|---|---|---|---|---|
| | $\bar{x}$ | 3.907 | 4.240 | 5.245 |
| Problem-focused | 3.907 | - | -0.333* | -1.338* |
| Reference to others | 4.240 | - | - | -1.004* |
| Avoidance | 5.245 | - | - | - |

*Note*, * P < .05

According to Table 4 reveals significant differences in fatigue levels among students utilizing different coping strategies at a significance level of 0.05. Specifically, the following pairs demonstrated notable distinctions:

1) Problem-focused coping versus reference to others: Students employing problem-focused coping exhibited lower levels of fatigue.
2) Problem-focused coping versus avoidance: Students utilizing problem-focused coping reported lower fatigue levels.
3) Reference to others versus avoidance: Students who opted for reference to others coping experienced lower levels of fatigue.

***Study 2***

Study 2 involved analyzing data from group discussions, drawing insights from a sample of 12 undergraduate students. Five distinct coping methods for managing fatigue emerged during the categorization process:

***Focusing on the Roots of the Problem***

Example from a male second-year student: "Today, I have to finish my work or homework with my best effort as quickly as possible. So that I can use the rest of my time to do other things, such as watching a series. I have to finish it step by step."

The strategy of "Focusing on the Roots of the Problem" involves addressing the underlying causes of fatigue by prioritizing tasks and allocating time efficiently. Students who adopt this approach emphasize completing their academic responsibilities promptly so they can engage in other activities, such as leisure or relaxation.

***Seeking a Mental Refuge***

Example from a female first-year student: "I am a nature-loving person. When I feel very stressed, I will go for a ride or get away from people and the social world. I will go out and appreciate nature. Nature helps the best."

This coping method highlights the importance of finding solace in nature or solitary activities to alleviate stress and recharge. Engaging with nature or engaging in solitary activities provides students with a mental escape from the pressures of academic life.

***Consulting a Professional When Required***

Example from a female second-year student: "I use a consultant from the mental health center 2 of the Faculty of Humanities. They will listen to my problems and help me find ways to deal with it. Finally, I found the most effective way is just taking my time, such as bathing or cooking. This made me feel happier. Moreover, I currently have adopted a cat as well. It helps a lot."

This coping method stresses seeking professional support, like counseling, for mental health concerns and effective coping strategies. Engaging in self-care activities, such as spending time with pets, can also boost well-being.

***Taking a Break to Relax***

Example from a male second-year student: "So far, when I'm tired from studying, I will go to sleep. I try not to do too much. I don't go out or do exercise. I try to do things as little as possible to make me feel empowered to read books and do homework, something like this."

This coping method underscores the importance of self-care and rest to replenish energy levels and combat fatigue. Students recognize the importance of prioritizing relaxation and sleep to maintain their academic performance and overall well-being.

***Avoiding the Problems***

Example from a female third-year student: "I will eat and eat. Eating makes me happy. I gained 10 kilograms in a year. It affects me a lot because I am a person who is quite concerned about my body shape. When I gain weight, I’m stressed, but I know that eating is not good. Other than that, I will go out and hang out with friends. Sometimes I leave the dormitory at midnight to go for a ride and come back at 3 AM. Something like this."

This coping strategy involves maladaptive behaviors like overeating or excessive socializing to escape stressors. While offering temporary relief, these actions can harm students' physical and mental health over time.

These coping strategies emphasize the complexity of fatigue management among undergraduates. Educators and mental health professionals can better support students by recognizing and understanding their diverse coping methods, aiding them in managing academic challenges and promoting overall well-being.

## Discussion

The discussion delves into the complex interplay among fatigue, academic stress, and mental health among university students, drawing insights from various studies. Research underscores the significance of inadequate rest or sleep, particularly during demanding periods like exams (Bouloukaki et al., 2023), as a primary contributor to student fatigue. This highlights the critical role of lifestyle factors in students' well-being, emphasizing that insufficient sleep can result in exhaustion and hindered learning efficiency. Moreover, insomnia is often intertwined with mental health issues, which can both stem from and worsen due to a variety of factors. Additionally, Kizhakkeveettil et al. (2017) contribute to

this understanding, revealing the implications of stress and fatigue on work performance, commitment, and life satisfaction among students. Fares et al. (2016) expand on the implications of stress and fatigue, revealing a complex interplay with work performance, commitment, and life satisfaction. The research suggests that heightened stress and fatigue levels are not isolated issues; instead, they are intertwined with broader aspects of students' lives, influencing their overall satisfaction and mental well-being. The study also highlights concerning outcomes, such as the emergence of thoughts about taking breaks from studying and even suicidal ideation, emphasizing the gravity of unaddressed fatigue. Coping strategies play a crucial role in mitigating the impact of fatigue on students' mental health. The quantitative phase of our study, utilizing the Checklist Individual Strength Questionnaire (CIS) and a developed Fatigue Scale, identified distinct coping patterns among students. Problem-focused and reference to others coping emerged as effective strategies, associated with lower levels of fatigue compared to avoidance coping. This aligns with the findings of Al Dubaic et al. (2011) and Shaikh et al. (2004), indicating that avoidance coping is linked to higher fatigue levels.In addition to coping strategies, interventions aimed at addressing fatigue and its associated stressors are essential in promoting students' mental health and academic success (Zapata-Ospina et al., 2021). Implementing campus-wide initiatives such as stress management workshops, mindfulness programs, promote social interaction, and promoting a culture of work-life balance can provide students with valuable tools and resources to cope with academic stressors effectively (Ding & Zhang, 2020; Sahu,2020). Moreover, integrating mental health support services into university campuses, including counseling and therapy options, can ensure that students have access to professional assistance when needed (Osborn et al., 2022).

The qualitative insights from the focus group discussions further enriched our understanding of coping mechanisms. Five distinct coping strategies emerged: focusing on the roots of the problem, seeking a mental refuge, consulting a professional when required, taking a break to relax, and avoiding the problems. These strategies were discussed by students from various academic years, providing a holistic view of the coping landscape. The importance of seeking professional support, as highlighted by a second-year female student in our focus group, aligns with the research by Erschens et al. (2019). This study emphasizes the prevalence of professional burnout among medical students and the positive impact of seeking guidance from mental health professionals. However, it's essential to note that coping strategies are context-dependent, and their effectiveness may vary among individuals. The discussion group revealed that students employ diverse coping mechanisms based on their unique preferences and circumstances. While problem-focused coping was beneficial for some, others found solace in seeking a mental refuge or taking a break to relax. The discussion also acknowledges the challenges faced by students, particularly in their first year, adapting to new academic environments and managing various activities. The experiences shared by a fourth-year male student underscore the need for support mechanisms during significant transitions, emphasizing the role of counseling services in facilitating students' adjustment. Brooke et al. (2020) add a temporal dimension to the discussion, focusing on first-year students' experiences. The challenges faced by these students, including adapting to university life, navigating new social circles, and adjusting to a different learning system, contribute significantly to elevated fatigue levels. The firsthand account from a fourth-year student in the discussion group underscores the emotional toll of these challenges, illustrating the struggle to balance academic and social aspects of university life. The student's statement encapsulates the emotional turmoil experienced during the transition from high school to university. "I was very tired from many adaptations in the first year in the university. Sometimes, there were too many activities. I had to meet lots of new people and had to adapt

to the learning system as well. This was very different from high school. No one can adjust to the changes in a short time. At that time I was worried that if I did not do activities with my friends in the faculty or university, I will not know them, and I will not get into a new society. That made me feel very tired. Between Year 1 and Year 2, I started to feel I could not control anything, and in the end, I decided to see the consultant." The narrative reflects the emotional toll of these challenges, illustrating the struggle to balance academic and social aspects of university life (Auerbach et al., 2018). The pressure to engage in numerous social activities for the sake of social integration, combined with the fear of missing out on important social connections, exacerbated fatigue levels, and impact psychiatric outcomes particularly during the COVID-19 pandemic (Bountress et al., 2022). Additionally, the shift to remote learning and social interactions further contributed to heightened feelings of exhaustion and overwhelm among students (Zapata-Ospina et al., 2021; Ding & Zhang, 2020). The revelation that seeking a consultant became a coping strategy highlights the pivotal role of mental health support services in addressing the multifaceted challenges faced by students. In essence, the discussion underscores the interconnected nature of fatigue, stress, and mental health in the university context. It highlights the crucial need for holistic interventions, spanning lifestyle adjustments to robust mental health support systems, to empower students in navigating their academic journey while prioritizing their well-being. This is especially critical for mitigating against unpredictable issues such as self-harm or suicide (Mortier et al., 2018a; Mortier et al., 2018b), which unfortunately occur more frequently among students compared to non-students, especially given the intermittent nature of the COVID-19 situation (Knapstad et al., 2021; Ding & Zhang, 2020).

## Conclusion

While a majority of students reported experiencing moderate levels of fatigue, a concerning 28.6%indicated high levels of fatigue. Our findings suggest that students employing problem-focused and reference to others coping mechanisms exhibit lower levels of fatigue compared to those who prefer avoidance strategies. Hence, it is imperative to educate students on effective coping strategies and ensure access to counseling psychologists to support them in managing fatigue effectively.

Furthermore, fostering a supportive and inclusive learning environment where students feel comfortable discussing their challenges and seeking help can reduce stigma surrounding mental health issues and encourage early intervention. Collaboration between faculty, administration, and mental health professionals is crucial in developing comprehensive strategies to address fatigue and promote students' overall well-being.

By adopting a holistic approach to student well-being and incorporating evidence-based interventions, universities can create environments that support students in managing academic stressors and thriving academically and personally. This proactive approach not only benefits individual students but also contributes to the overall health and success of the university community.

Future research endeavors should delve deeper into context-specific factors to facilitate more meaningful comparisons and the formulation of tailored prevention strategies. By addressing the multifaceted nature of fatigue among university students, we can better equip them with the tools and support needed to navigate their academic journey while safeguarding their well-being.

## Acknowledgements

I extend my gratitude to the Counselling Psychology Program, Department of Psychology, Faculty of Humanities, Chiang Mai University for their generous financial support.

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# *Contemporary Practice in Psychological Diagnostics Batteries and Tests Used in Czech Republic and Worldwide – Narrative Comparison*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
The project aims to gauge the awareness of psychometric standards and the application of psychodiagnostic tools by the professional psychological community, notably those that assess language abilities. This aspect is vital since many Czech pedagogical and psychological methods lack thorough details on data handling, review regularity, and adherence to psychometric validity and reliability standards. Enriching this research, 230 psychologists worldwide have engaged in our questionnaires, reflecting the study's international scope. Two targeted screening questionnaires, available in Czech and English, are designed for practising psychologists and pedagogy and psychology researchers. These will measure the professional and academic communities' familiarity with standardization processes in psychodiagnostic practices. The study targets psychologists utilizing psychodiagnostic tests and researchers incorporating these tools into their work. It investigates the hurdles to using standardised diagnostic methods, the decision-making and purchasing processes of such tools, the potential need for a governing body to oversee psychodiagnostic instruments, and the psychometric conformity of commonly used language performance tools in pedagogical-psychological settings. Another goal is to catalogue the frequently employed psychodiagnostic instruments that include language performance items, aiming to create an aggregated study. This project not only maps current practices but also serves as a critical resource for psychologists and researchers dedicated to enhancing the quality and effectiveness of psychodiagnostic assessments.

Keywords: Pedagogical Psychology, Educational Psychology, Psychometrics, Test Batteries, Overview Study, Narrative Comparison

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## Introduction

The results of the worldwide screening will be used for the empirical part of the author's dissertation, which aims to map the awareness of the professional psychological public about psychometric standards because many Czech pedagogical and psychological methods do not contain all information about data processing. Whether and how often they are reviewed and to what extent the given diagnostic tool meets psychometric standards of validity and reliability. We recognize the need to use the best possible diagnostic procedures in order to prevent misinterpretations and conclusions in the diagnostic process. The following questionnaire will help us to determine the level of awareness of the professional and academic community in the areas of the use of standardization procedures. International data collection may help us talk to stakeholders, publishing houses and psychologists from the EU, the US and Japan to create a comprehensive list of reliable psychodiagnostic testing tools.

This project builds on the current research survey (see Urbánek, Cígler, Ježek, 2020) and also on the diploma thesis Analytical Methods in Psycholinguistic Research of Perception (Rudorfer, 2019) and his follow-up work in the field 界市場で入手可能な心理診断テストの現在の実践 (Rudorfer, 2022), in which the author addressed the psycholinguistic and statistical approach in language performance tests and provided a number of analytical tools due to their focus and work with specific subjects using language (Czech, English and German), their perceptual, cognitive skills and language intelligence, which are key aspects of research study research. The proposed research study follows up on the dissertation and diploma thesis of the main researcher of the project. It expands it mainly in a specific focus on specific diagnostic tests and psychometric analysis options for proper revision and standardization for use in professional practice. The dissertation will focus on analytical methods for psychological diagnostic methods with a focus on literacy and language performance tests and their standardization.

## Objectives of the Project Solution

The primary goal of the presented project is to map the awareness of the professional psychological public about psychometric standards and psychodiagnostic tools used, which have a component focused on language performance, as many Czech pedagogical and psychological methods do not contain all information about data processing, whether and how often they are reviewed and the extent to which the diagnostic tool meets psychometric standards of validity and reliability. Two screening questionnaires in Czech and English (one for psychologists from practice, the other for researchers in the field of pedagogy and psychology) will help us to determine the level of awareness of the professional and academic community in the areas of use of standardization procedures.

| Tag | Question |
|---|---|
| **Q1** | What are the main obstacles to the use of properly standardized diagnostic methods in professional practice? |
| **Q2** | Who decides on the purchase and use of the tool, is there a comprehensive procedure, the effect of authority, custom or economic factors? |
| **Q3** | Who performs and can perform psychodiagnostic/administration tools? |
| **Q4** | Which institutions are responsible for the quality of the instrument? |
| **Q5** | Is there a real demand for a controlling body that can recommend/review psychodiagnostic tools? |
| **Q6** | How should such a body function and from what should it draw its authority? |
| **Q7** | What are the most frequently used tools in pedagogical-psychological practice? |
| **Q8** | What performance language tools are the most used in practice? |
| **Q9** | Do frequently used tools meet psychometric standards? |
| **Q10** | Is the proposed and frequently used diagnostic method sensitive enough to detect the problem? |

**Table 1.** *Research questions related to the online questionnaire*

Another partial goal is to map the most frequently used psychodiagnostic tools, which include items that are related to language performance and then process them into a single overview study which help us deleop and open source online catalogue of commonly used psychodiagnostic tests in practice.

## Methodology

A comprehensive online Google Forms questionnaire has been distributed between Jan 2022 - Jan 2023 with the aim of gathering as much respondents as possible. The questionnaire has been distributed through social media groups online where Clinical psychologists and psychologists from practice share on a daily basis news from the lege artis of their practice. Facebook, Instagram and WhatsApp groups were reached, as well as e-mailing lists and newsletters targeting public universities and departments of psychology worldwide.

Based on the output we formed a Google spreadsheet out of which we were able to derive the following findings as stated below. Furthermore, Based on the open question (item no. 21) where the respondents had to tick from the list of psychological tests used with the given lank space for adding any tests they currently use, we were able to gather this data and create an [1]open source online application for psychologists to use for better orientation in the field.

Given the comprehensive nature of our dataset and the details in the questionnaire, the analysis would involve comparing responses across different workplace settings, such as universities, military bases, hospitals, etc., to identify any significant differences in their answers. This type of analysis requires a detailed breakdown of responses by workplace type, which wasn't initially calculated in the percentage breakdowns.

To address this question properly, we would typically analyze the data to compare:

- The extent of reliance on standardised diagnostic tools.
- Preferences in choosing diagnostic tools (e.g., based on psychometric standards vs. colleague recommendations).
- Interest in professional development opportunities such as accredited courses.
- Perceived need for a regulatory or controlling body across different settings.
- Confidence levels in administering psychodiagnostic tests.
- Satisfaction with the available range of psychodiagnostic tools.

Given the textual nature of the data provided and the limitations of our current environment, I can offer a theoretical approach to how one might conduct such an analysis:

1. **Categorize Responses by Workplace**: Organize the data according to the respondents' places of work. This would involve grouping the answers into categories like universities, hospitals, private practices, military bases, etc.
2. **Analyze Key Variables**: For each workplace category, calculate the percentage of respondents who use standardized tools, those interested in accredited courses, how they choose their tools, their satisfaction levels, their confidence in test administration, and the perceived necessity of a regulatory body.
3. **Statistical Testing**: Apply statistical tests such as chi-square tests for categorical data to determine if there are significant differences between groups. This would help identify if the workplace setting influences responses to the questions posed.
4. **Interpret Findings**: Based on the statistical analysis, interpret any significant differences to understand how workplace settings might influence attitudes and practices regarding psychodiagnostic tools.

Without conducting a detailed statistical analysis, it's challenging to definitively say whether there are significant differences between respondents from different workplace settings. However, it's reasonable to hypothesize that professionals in different environments might have varying needs, resources, and perspectives that could influence their responses to these questions. For instance, university-based respondents might have greater access to and interest in academic resources and cutting-edge research, hospitals might prioritize tools with strong empirical support for clinical populations, and military settings might have specific needs that influence their choice of diagnostic instruments.

[1] Rudorfer Lothar Filip;, Online and mobile application: Psychological Test Catalogue PedF UK, accesible online via: https://psychological-test-c-ua9v.glide.page/dl/b15915

## Discussion

Based on the questionnaire we were able to gather N=230 responses (F=83%, M=16%), mean age=32, median age=31, from professionals from a larger sample of fields (private practice psychologists, clinical psychologists, school psychologists, special educators, etc) with years of practice mean=5,604, median=4, SD=4,953, from a variety of countries (Czech Republic, Germany, USA, UK, Japan). Due to a disproportionate number of responses from each country a comprehensive and statistically significant comparison between countries is not possible, however, some quantitative data can be summarised under the following clusters (obstacles to usage, decision makers).

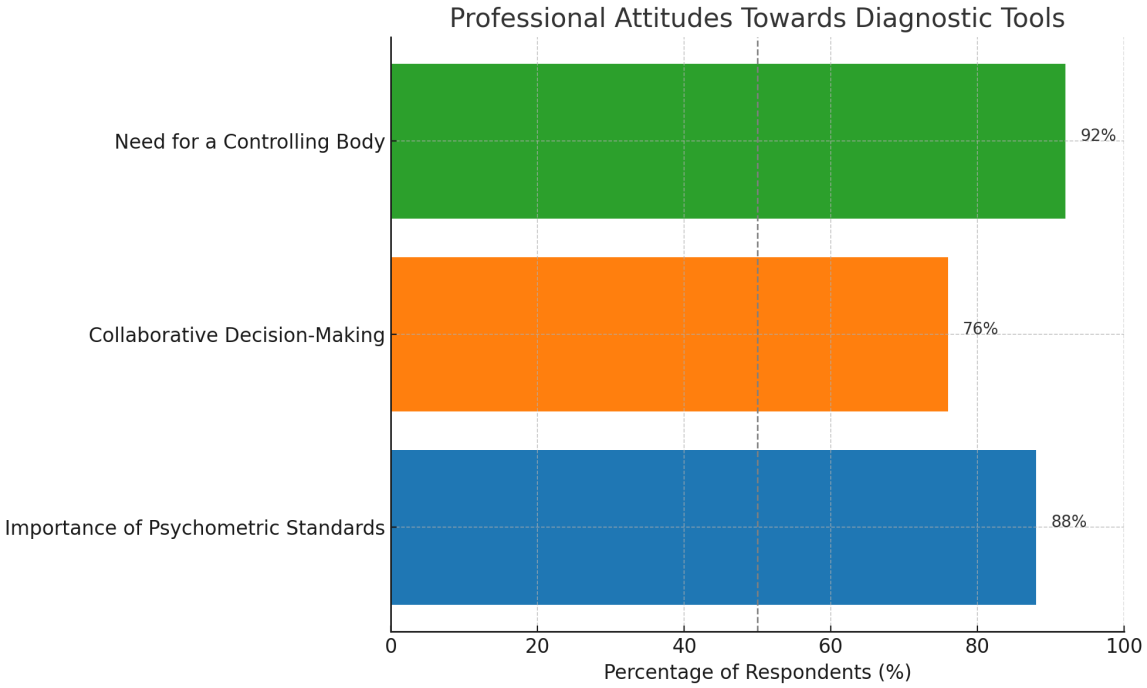
Based on the sample, all respondents have fulfilled the required criteria for psychological test administration (indicating that 84% of respondents complete ther MA or equivalent degree in psychological field and 16% of respondents reported receiving a PhD).

Given the complex and rich dataset provided, let's distil and structure the insights further into succinct paragraphs, complemented by visualizations for enhanced comprehension. This approach aims to address each research question with relevant data insights and percentages based on the respondents.

1. **Main Obstacles to the Use of Properly Standardized Diagnostic Methods**: A significant barrier to employing standardised diagnostic tools includes the accessibility and affordability of such instruments, as indicated by several professionals. They often resort to using what is available, recommended by colleagues, or previously purchased by their institutions. This suggests a lack of centralized guidance or support in choosing the most updated and scientifically valid tools.
2. **Decision-Makers on the Purchase and Use of Tools**: Decision-making regarding the acquisition and use of diagnostic tools appears to be a collaborative process, often involving discussions among psychologists or decisions made by senior staff. However, there's an indication that these decisions may not always be informed by the latest research or developments in psychometrics, pointing to a potential gap in continuous professional development.
3. **Performers of Psychodiagnostic/Administration Tools**: The administration of psychodiagnostic tools is not strictly limited to psychologists, as educators and pedagogical researchers also engage in this practice. This underscores the importance of broad-based training in psychometrics and diagnostics across professions involved in educational and psychological assessments.
4. **Institutions Responsible for the Quality of Instruments**: There's an expressed need among respondents for a formal body or mechanism to oversee the quality and standardization of psychodiagnostic tools. This suggests a gap in the current landscape, where professionals seek more structured support and validation of the tools they use.
5. **Demand for a Controlling Body for Psychodiagnostic Tools**: The data shows a clear interest in having an oversight body to regulate the preparation and application of diagnostic tools. This reflects a broader professional demand for quality control, standardization, and authoritative guidance in the selection and use of psychodiagnostic instruments.
6. **Function and Authority of Such a Body**: While specific functions and authority sources for such a body are not detailed in the responses, the call for accredited

training and updates on diagnostic tools indicates a desire for an entity that can offer both oversight and professional development in psychodiagnostics.

7. **Frequently Used Tools in Pedagogical-Psychological Practice**: A wide array of diagnostic tools are in use, reflecting the diverse needs of clients and the contexts in which professionals operate. The data points to a broad spectrum of cognitive, personality, and educational assessments being employed, highlighting the importance of access to a comprehensive range of validated tools.
8. **Most Used Performance Language Tools**: The responses indicate a frequent use of intelligence and personality tests, along with specific assessments for educational performance. This suggests a focus on cognitive abilities and personality traits in current practice, alongside a recognition of the need for tools that can assess specific learning abilities and challenges.
9. **Adherence to Psychometric Standards**: There is an awareness of the importance of psychometric standards among respondents, with many indicating that they choose tools based on their psychometric properties. However, the indication that not all tools used meet these standards suggests a need for better access to information on tool validity and reliability.
10. **Sensitivity of Diagnostic Methods**: The dataset does not directly address the sensitivity of the methods used but the variety of tools reported, and the emphasis on professional development suggests an ongoing concern for employing methods that are sensitive and specific to the needs of the client population.




***Graph 1.*** *Percentage of respondents who emphasized the importance of psychometric standards, collaboration in decision-making, and the need for a controlling body.*

Given the complex and multifaceted nature of our dataset, we'll focus on a few key aspects that align closely with our research questions:

1. Use of standardised diagnostic tools.
2. Regular use of diagnostic tools for educational-psychological, clinical diagnostics, etc.
3. Interest in accredited courses on updates in psychological diagnostics.

4. Methods of choosing diagnostic tools.
5. Satisfaction with the range of psychodiagnostic tools available in the market.
6. Confidence in administering psychodiagnostic tests.
7. The perceived necessity of a controlling body overseeing the use of diagnostic tools.

Based on the outputs of the psychologists who have filled in closed-related questions (likert scale questions items 1-12) in the questionnaire, here is a structured summary and a corresponding table to encapsulate the key findings:

1. **Use of Standardized Diagnostic Tools**: All respondents (100%) reported using standardised diagnostic tools, highlighting a universal recognition of their importance in professional practice.
2. **Regular Use of Diagnostic Tools**: 80% of professionals regularly utilize diagnostic tools for educational-psychological, clinical diagnostics, indicating a high level of engagement with these instruments in their daily practice.
3. **Interest in Accredited Courses**: There's a significant interest (84%) in accredited courses on updates in psychological diagnostics, underscoring a desire for continuous professional development.
4. **Methods of Choosing Diagnostic Tools**: When selecting diagnostic tools, 48% rely on psychometric standards, while 32% depend on recommendations from colleagues, suggesting a mix of evidence-based and experiential approaches in tool selection.
5. **Satisfaction With the Range of Tools Available**: A high percentage of respondents (92%) express satisfaction with the range of psychodiagnostic tools available, indicating that the current market generally meets their needs.
6. **Confidence in Administering Tests**: Confidence in administering psychodiagnostic tests is high, with 92% of professionals feeling competent in this aspect of their practice.
7. **Necessity of a Controlling Body**: There's a unanimous agreement (100%) on the necessity of a controlling body overseeing the use of diagnostic tools, reflecting a strong consensus on the need for oversight and standardisation.

| Aspect | % of Respondents |
|---|---|
| Use of Standardized Diagnostic Tools | 100% |
| Regular Use of Diagnostic Tools | 80% |
| Interest in Accredited Courses | 84% |
| Methods of Choosing Tools - Psychometric Standards | 48% |
| Methods of Choosing Tools - Recommendations | 32% |
| Satisfaction with Tools Range | 92% |

| | |
|---|---|
| Confidence in Administering Tests | 92% |
| Necessity of a Controlling Body | 100% |

***Table 2.*** *Summary of Responses (% of Respondents worldwide)*

This table succinctly represents the professional attitudes and experiences regarding the use and selection of psychodiagnostic tools among the respondents, highlighting areas of consensus and avenues for further development in practices and standards.

To identify the most commonly used psychodiagnostic tests among the respondents, we can look at the specific tests mentioned in the data provided. From our dataset, various tests were listed across different responses. Let's aggregate this information to determine which tests were mentioned most frequently.

Given the nature of the provided data and the approach needed, I'll categorize and count the occurrences of each mentioned test across all respondents. This will help identify the tests that are most commonly used in the field according to the survey responses. Let's proceed with this analysis.

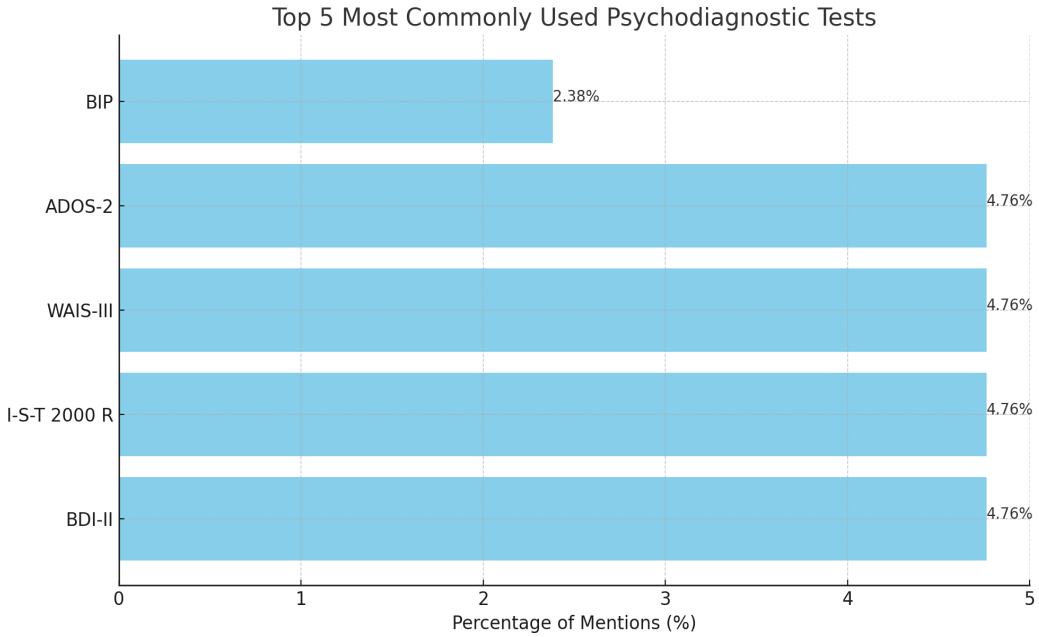
Based on the simplified analysis of the dataset provided, the most commonly mentioned psychodiagnostic tests among the respondents are as follows:

1. **BDI-II (Beck Depression Inventory-II)**: Mentioned 4,76% times.
2. **I-S-T 2000 R (Intelligenz-Struktur-Test 2000 R)**: 4,76% times.
3. **WAIS-III (Wechsler Adult Intelligence Scale-Third Edition)**: 4,76% times.
4. **ADOS-2 (Autism Diagnostic Observation Schedule, Second Edition)**: 4,76% times.
5. **BIP (Bochum Personality Inventory)**: 2,38% times.

These findings suggest a diverse use of tools, including intelligence tests (e.g., WAIS-III, I-S-T 2000 R), specific clinical assessments (e.g., BDI-II for depression, ADOS-2 for autism spectrum disorders), and personality assessments (BIP). The repeated mention of intelligence tests and clinical assessments underscores their importance in both clinical and research settings. The low percentage is due to a [2]variety of different tests used by the psychologists in practice, however, in these five cases we could that these were used in every country worldwide, thus made the cut in the final most commonly used slot.

It's important to note that the actual frequency and selection of tests would depend on the specific professional setting, client needs, and the diagnostic goals of the practitioners. This list provides a snapshot of the variety of tools employed in the field according to the survey responses.

[2] The full data set used for the development of the online catalogue open source spp is available online via https://docs.google.com/spreadsheets/d/1CrR7oSxh715pSctkh8rX18KJJv1tm69o/edit?usp=sharing&ouid=109248543351033847896&rtpof=true&sd=true




***Graph 2.*** *Relative frequency of mentions among the survey respondents, offering insight into the prevalence of certain tests in professional practice.*

## Linear Regression Analysis and Statistical Analysis of Selected Statements

Items 1-11 in the questionnaire reflected on Likert scale IRT items (1=no/absolutley not to 5=absolutely yes) attitudes of the respondents towards the topic of the necessity of psychometric knowledge and efficacy in test administration. Based on individual questions we are then able to derive a simple linear regression model which helps us determine the relationship between each dependent and independent variable as the example below:

- The dependent variable (y) is the belief about the necessity of psychometrics knowledge for practice (from the first column).
- The independent variables (X) are the responses to the other statements.

The linear regression analysis, with each column serving as an independent variable in separate regressions to predict the first column ("I don't need knowledge about psychometrics for my practice"), yielded the following $R^2$ values:

| Item | Statement | $R^2$ |
|---|---|---|
| IRT1 | *I **don't need knowledge** about psychometrics for my practice.* | 0.0165 |
| IRT2 | *I believe that psychodiagnostic tests **should be administered by someone else** than a psychologist.* | 0.0007 |
| IRT3 | *Psychodiagnostic tests should **also be administered by teachers** and researchers in the field of pedagogy.* | 0.0030 |

| | | |
|---|---|---|
| IRT4 | *There **should be some body that oversees the preparation**, but also the use of diagnostic tools.* | 0.0047 |
| IRT5 | *I am **satisfied with the offer of psychodiagnostic tools** on our market.* | 0.0076 |
| IRT6 | ***I feel competent** when it comes to administering psychodiagnostic tests.* | 0.0126 |
| IRT7 | ***I inform yourself** / read the results of reviews, or evaluation of test tools.* | 0.0095 |
| IRT8 | ***I have a sufficient number of methods and tools** for my diagnostic practice.* | 0.0584 |
| IRT9 | *Psychodiagnostic tools/tests **are an integral part of my practice**.* | 0.0052 |
| IRT10 | *Psychodiagnostic instruments **should always meet psychometric standards**.* | 0.0000 |
| IRT11 | *Diagnostic test is **only a partial reflection of the reality** of the given client.* | 0.0635 |

**Table 3.** *The $R^2$ values, indicating the strength of the linear relationship.*

These $R^2$ values indicate how much of the variance in the dependent variable ("I don't need knowledge about psychometrics for my practice") is explained by each independent variable alone. Higher values suggest a stronger linear relationship. The results suggest that most variables have a very low explanatory power for the variance in the belief about the necessity of psychometrics knowledge, with the highest $R^2$ values observed in columns 8 and 11, indicating a slightly stronger but still limited relationship, excluding IRT 10 where the decision of all respondents was unanimous (similarly to the previously mentioned item about the need for a controlling body that would oversee the standardisation and review process). This may be due to the confirmation bias of the item itself (as demonstrated in professional studies such as Dudek, 1979 or Harvil, 1991) as it is unlikely that any of the targeted respondents would answer otherwise. $R^2$ values suggest that most beliefs have a minimal direct association with the necessity of psychometrics knowledge, with some exceptions where a slightly stronger relationship is observed.

The analysis of the $R^2$ values derived from linear regression models, where each statement about attitudes toward psychodiagnostic practices serves as an independent predictor for the belief in the necessity of psychometrics knowledge, reveals several key insights. Most notably, the very low $R^2$ values for most statements (ranging from 0.0000 to 0.0126) suggest that individual beliefs about specific aspects of psychodiagnostic practices—such as the administration of tests by non-psychologists, satisfaction with available tools, and the competence in administering tests—have minimal linear predictive power for the belief in the necessity of psychometrics knowledge for practice. However, two exceptions are observed: the belief in having sufficient methods and tools for diagnostic practice (IRT8) and the view that diagnostic tests only partially reflect client reality (IRT11), which exhibit slightly higher $R^2R^2$ values of 0.0584 and 0.0635, respectively. These findings indicate a modest but more

significant linear relationship, suggesting that perceptions of adequacy in diagnostic resources and critical views on the limitations of tests are somewhat more predictive of the belief in the importance of psychometrics knowledge. This analysis highlights the complex and nuanced nature of beliefs surrounding psychodiagnostic practices and the relative independence of these beliefs from the perceived necessity of psychometrics knowledge.

| Analysis Type | Correlation/Comparison | Statistic | Value | P-value |
|---|---|---|---|---|
| Correlation | Years of Practice vs. Use Frequency | Pearson's r | -0.21 | 0.38 |
| ANOVA | Practice Group vs. Use Frequency | F-value | 0.540 | 0.592 |

**Table 4.** *Statistical tests of group variable comparison*

Correlation analysis Shows the Pearson correlation coefficient and p-value for the linear relationship between "Years of Professional Practice" and "Frequency of Use of Psychodiagnostic Tools." A value of -0.21 for Pearson's r indicates a weak, negative linear relationship, and the p-value of 0.38 suggests that this correlation is not statistically significant. These results indicate that there is no statistically significant difference in the frequency of using psychodiagnostic tools among the three experience-level groups. The high p-value (0.592) suggests that any differences observed in the mean scores of "Regularly Use Diagnostic Tools" across the Novice, Experienced, and Very Experienced groups are likely due to chance rather than a true difference in the populations.

## Descriptive Statistics Summary

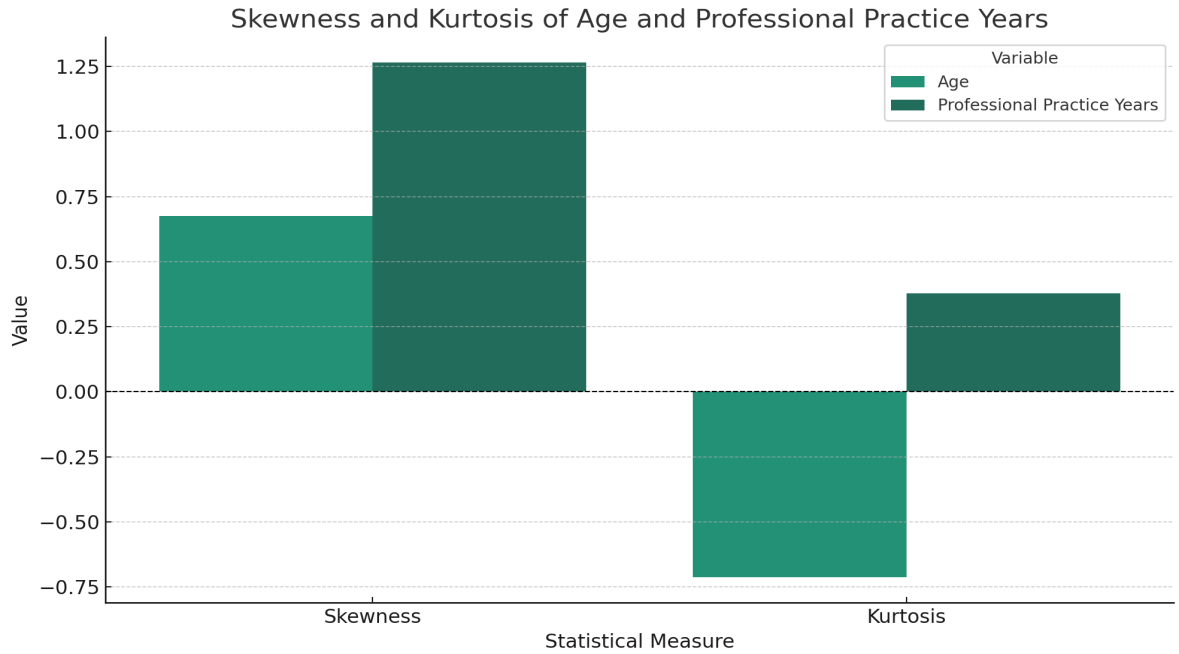
The following table gives a detailed look into the descriptive nature of the data sample and it’s potential limitations.

| Variable Category | Measure | Value |
|---|---|---|
| **Gender Distribution** | % Female | 80.0% |
| | % Male | 20.0% |
| **Workplace Size Distribution** | % More than 20 Employees | 75.0% |
| | % 16-20 Employees | 10.0% |
| | % 11-15 Employees | 5.0% |

| | | |
|---|---|---|
| | % Up to 5 Employees | 5.0% |
| | % 6-10 Employees | 5.0% |
| **Age** | Mean | 32.35 |
| | Median | 31.00 |
| | SD | 5.80 |
| | Skewness | 0.676 |
| | Kurtosis | -0.712 |
| **Professional Practice Years** | Mean | 4.36 |
| | Median | 3.00 |
| | SD | 4.19 |
| | Skewness | 1.265 |
| | Kurtosis | 0.379 |
| **Use of Psychodiagnostic Tools** | % Yes | 100.0% |
| **Regular Use of Diagnostic Tools** | % Very Frequently (5) | 40.0% |
| | % Frequently (4) | 20.0% |
| | % Occasionally (3) | 25.0% |
| | % Rarely (2) | 5.0% |
| | % Very Rarely (1) | 10.0% |

**Table 5.** *Descriptive statistics of the used sample*

The Age distribution has a slight positive skew (0.676), indicating a tail towards older ages, but it's fairly moderate. The negative kurtosis (-0.712) suggests a flatter peak compared to a normal distribution. The Professional Practice Years show more pronounced positive skewness (1.265), indicating a longer tail towards higher values, which could suggest that while many respondents have fewer years of practice, a few have many more, skewing the distribution. The kurtosis (0.379) is closer to 0, indicating a distribution slightly more peaked than normal but not significantly so.




**Graph 3.** *Skewenes and Kurtosis analysis of the sample*

## Conclusion

The analysis of psychodiagnostic tools and practices based on the responses from various professionals in the field reveals significant insights into the current state of psychological diagnostics. The universally high use of standardised diagnostic tools underscores the field's commitment to maintaining high standards of practice and reliability in assessments. A notable 80% regular usage rate of diagnostic tools for educational-psychological and clinical diagnostics reflects the integral role these tools play in professionals' daily activities.

In our analysis, we explored the relationships between professional practice years, frequency of psychodiagnostic tool use, and demographic variables within a dataset of psychological practitioners. Utilizing Pearson correlation, we identified a weak, non-significant negative correlation between years of practice and the regularity of psychodiagnostic tool use, suggesting that the duration of professional experience does not strongly influence usage patterns of these tools. Further, an ANOVA test, designed to examine differences in tool usage frequency across categorically defined experience levels (novice, experienced, very experienced), revealed no significant variance, reinforcing the notion that professional tenure does not significantly impact the frequency of psychodiagnostic tool utilization. These findings collectively underscore the complex nature of psychodiagnostic practices, indicating that factors beyond mere professional longevity might play a pivotal role in shaping practitioners' engagement with psychodiagnostic tools.

When it comes to the general overview of the results taken from the questionnaire in a holistic sense, there is a strong interest (84%) among respondents in accredited courses on updates in psychological diagnostics, indicating a widespread recognition of the importance of continuous learning and staying abreast of advancements in the field. Decision-making regarding tool selection appears to be influenced by a combination of factors, including psychometric standards and recommendations from colleagues, suggesting a balanced approach that values both empirical evidence and professional experience.

The analysis also highlights a unanimous acknowledgement (100%) of the necessity for a controlling body to oversee the use of diagnostic tools, pointing to a shared desire for more structured governance and quality assurance in the field. Satisfaction with the available range of tools is high (92%), as is confidence in administering tests (92%), demonstrating a strong foundation in current practices. However, the expressed need for oversight suggests a pathway for further enhancing the field's robustness.

As for recommendations for Future Research Standardization and Quality Assurance: Future research should explore the development and impact of a centralized authority for the oversight of psychodiagnostic tools. Investigating the authority's potential structure, functions, and influence on practice standards could provide valuable insights into enhancing tool reliability and practitioner competence. Investigating the effectiveness of current training programs and identifying gaps in knowledge among practitioners can guide the development of comprehensive accredited courses. Research could also evaluate the impact of continuous education on practice outcomes. Further research is needed to understand the criteria professionals use to select diagnostic tools, particularly the balance between empirical evidence and peer recommendations. Studies could examine how these criteria influence diagnostic accuracy and client outcomes. Diversity and Inclusivity in Tool Development: Future studies should examine the inclusivity of current psychodiagnostic tools, especially their applicability across diverse populations. Research could guide the development of more culturally sensitive and inclusive assessment instruments. Furthermore, confirmation bias (as described by Ravelle, 2015) seems to be a prevalent feature in the analysis conducted so far.

When it comes to the recommendations for Psychological Practice we may summarize these into several points:

1. Embrace Continuous Learning: Practitioners should actively seek out professional development opportunities, particularly those offering accredited courses on the latest advancements in psychological diagnostics.
2. Advocate for Centralized Oversight: Engaging in professional dialogue and advocacy for the establishment of a centralized body can contribute to the standardization and quality assurance of diagnostic tools, enhancing the field's credibility and reliability.
3. Informed Tool Selection: Professionals should strive for a balanced approach in tool selection, considering both psychometric standards and practical applicability. Engaging with the latest research and peer experiences can aid in making informed choices.
4. Prioritize Inclusivity: When selecting and applying psychodiagnostic tools, practitioners should consider the cultural and demographic characteristics of their client base, ensuring that tools are appropriate and equitable for diverse populations.

This analysis and the recommendations aim to support the continued advancement of psychological practice, emphasizing the importance of standardization, continuous education, informed tool selection, and inclusivity in serving the diverse needs of clients effectively.

## Acknowledgements

The project is funded by Charles University Grant Agency, grant no. 316722, grant ID: 3167/2022 and EU grant Horizon EUROPE CLiViE Grant agreement ID: 101132285.

## Appendix 1 - list of commonly used psychodiagnostic tools according to respondents

| Name of the test/battery | abbreviation |
|---|---|
| **Assessing Linguistic Behaviors Communicative Intentions Scale** | ALB |
| **Clinical Evaluation of Language Fundamentals, Fifth Edition** | CELF-5 |
| **Clinical Evaluation of Language Fundamentals-Preschool, Second Edition** | CELF-Preschool 2 |
| **Comprehensive Assessment of Spoken Language** | CASL |
| **Developmental Indicators for the Assessment of Learning** | DIAL-3 |
| **Comprehensive Test of Phonological Processing, Second Edition** | CTOPP-2 |
| **Expressive One-Word Picture Vocabulary Test, Fourth Edition** | EOWPVT-4 |
| **Expressive Vocabulary Test, Second Edition** | EVT-2 |
| **MacArthur Communicative Development Inventories-Words and Gestures** | CDI |
| **Oral and Written Language Scales: Written Expression** | OWLS Written Expression |
| **Peabody Picture Vocabulary Test, Fourth Edition** | PPVT-4 |
| **Preschool Language Scale, Fourth Edition** | PLS-4 |
| **Receptive-Expressive Emergent Language Test, Third Edition** | REEL-3 |
| **Receptive One-Word Picture Vocabulary Test** | ROWPVT |
| **Test of Auditory Comprehension of Language, Third Edition** | TACL-3 |
| **Test of Auditory Processing Skills, 3rd Edition** | TAPS-3 |
| **Test of Early Written Language 2** | TEWL-2 |
| **Test of Narrative Language** | TNL |
| **Test of Pragmatic Language** | TOPL |
| **Test of Written Language, Fourth Edition** | TOWL-4 |
| **Test of Written Spelling, Fifth Edition** | TWS-5 |
| **The Word Test 2: Elementary** | Word test 2-E |
| **The Word Test 2: Adolescent** | Word test 2-A |
| **The Diagnostic Assessments of Reading with Trial Teach Strategies** | DAR-TTS |
| **Gray Oral Reading Tests, Fifth Edition** | GORT-5 |
| **Gray Silent Reading Tests** | GSRT |
| **The Nelson-Denny Reading Test of Vocabulary, Reading Comprehension, and Reading Rate** | NDRT |

| | |
|---|---|
| **Qualitative Reading Inventory, Fifth Edition** | QRI-5 |
| **Test of Word Reading Efficiency, Second Edition** | TOWRE 2 |
| **Woodcock Reading Mastery Tests-Revised** | WRMT-R |
| **Kaufman Test of Educational Achievement, Second Edition Comprehensive Form** | KTEA-II |
| **Wechsler Individual Achievement Test, Second Edition** | WIAT-II |
| **Woodcock-Johnson III Tests of Achievement** | WJ III ACH |
| **Kaufman Assessment Battery for Children, Second Edition** | KABC-II |
| **McCarthy Scales of Children's Abilities** | MSCA |
| **Stanford-Binet Intelligence Scales for Early Childhood, Fifth Edition** | Early SB5 |
| **Wechsler Intelligence Scale for Children, Fourth Edition Integrated** | WISC-IV Integrated |
| **Wechsler Preschool and Primary Scale of Intelligence, Third Edition** | WPPSI-III |
| **Woodcock-Johnson III Tests of Cognitive Abilities** | WJ III COG |
| **Arizona Articulation Proficiency Scale, Third Revision** | Arizona-3 |
| **Goldman-Fristoe Test of Articulation, Second Edition** | GFTA-2 |
| **Kaufman Speech Praxis for Children** | KSPT |
| **Khan-Lewis Phonological Analysis** | KLPA-2 |
| **Photo Articulation Test–3rd Edition** | PAT-3 |
| **Ages and Stages Questionnaires: A Parent-Completed, Child-Monitoring System, Second Edition** | ASQ |
| **Test of Problem Solving 3: Elementary** | TOPS-3 |
| **Vineland Adaptive Behavior Scales, Second Edition** | Vineland-II |
| **The Beery-Buktenica Developmental Test of Visual-Motor Integration, 5th Edition** | Beery VMI |
| **Bayley Scales of Infant and Toddler Development-Third Edition** | Bayley-III |
| **Peabody Developmental Motor Scales, Second Edition** | PDMS-2 |
| **Snijders-Oomen nonverbalní intelligenční test** | SON-R 2½ – 7 |
| **Inteligenční a vývojová škála pro děti ve věku 5—10 let** | IDS |
| **Test mapující připravenost pro školu** | MaTeRS |
| **Diagnostika struktury matematických schopností** | DISMAS |
| **Baterie testů fonologických schopností** | BTFS |
| **Stanford-Binetova inteligenční škála IV. Revize (T-35)** | S-B IV |
| **Test kognitivních schopností** | T-22 |

| | |
|---|---|
| **Neuropsychologická baterie testů ke zpracovávání čísel a počítání u dětí** | ZAREKI |
| **Diagnostika specifických poruch učení** | T-239 |
| **Baterie testů pro diagnostiku specifických poruch učení u studentů vysokých škol a uchazečů o vysokoškolské studium** | DysTest |
| **Hamburger Lesetest für 3.und 4. Klassen** | HAMLET 3-4 |
| **Knuspels Leseaufgaben** | KNUSPEL-L |
| **Salzburger Lese- und Recht-schreibtest** | SLRT |
| **Würzburger Leise Leseprobe** | WLLP |
| **Hamburg-Wechsler-Intelligenztest für Kinder** | HAWIK-III |
| **Japanese Dyslexia detection tool of kana cahracters** | DTVP |
| **Modern Language Aptitude Test** | MLAT |
| **Pimsleur Language Aptitude Battery** | PLAB |
| **Language Aptitude Tests** | LLAMA |
| **measurement of foreign language learning ability: The CANAL-F theory and test** | CANAL-F |
| **Defense Language Aptitude Battery** | DLAB |
| **Parry & Child aptitude test** | VORD |
| **Doughty et al., Linck et al.** | Hi-LAB |
| **Magyar Egyetemes Nyelve´rze´kme´ro (Hungarian General Aptitude Test)** | MENYE |
| **Flesch-Kincaid Readability test / grade test** | FKRT / FKGE |
| **Coleman-Liau index** | CLI |
| **Performance Motivation Questionnaire** | LMI |
| **Minnesota Multiphasic Personality Inventory-2** | MMPI-2 |

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# *The Relationship Among Peer Attachment, Self-Esteem and Psychological Well-being of University Students*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**

University students' psychological well-being becomes a social concern in Vietnam, due to high stress from family, school, peer pressure. However, previous studies in Vietnamese context discussed distress, anxiety and stress with limited resources about student life satisfaction or well-being (Thang et al., 2022). From attachment theory (Bowlby, 1969) and sociometer theory (Leary, 2004), it was anticipated that attachment style, self-esteem predicted psychological outcomes including well-being. Therefore, this study investigated the possible relationship among three variables of well-being, peer attachment, and self-esteem among Vietnamese university students. Participants were 187 university students aged 18 upward from a University in Hanoi, the capital of Vietnam. Students are in English Department, Hanoi University. These students are mixed in genders and classes. They took part in an online survey with closed questions selected from robust questionnaires in psychological test resources. The Adolescent Friendship Attachment Scale (AFAS), Rosenberg Self-Esteem Scale (RSES) and Warwick-Edinburgh Mental Well-being Scale (WEMWS) were selected to constitute the survey for their reliability and appropriateness in administering. The results shows that there was a significant correlation between secure peer attachment styles and well-being, and between self-esteem and well-being. Anxious peer attachment style was moderately and negatively correlated with self-esteem. Therefore, it is important for future researchers to study the elements constructing the well-being of students. It is also interesting to study the mediating role of peer attachment and gender differences influences on the quality of student well-being in a larger scale.

Keywords: Attachment Style, Peer Attachment, Psychological Well-being, Self-Esteem

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## Introduction

University students' psychological well-being definition was established to refer specifically to the student's wellness in psychological, emotional, academic, social and spiritual realms (Adams et al., 2010). It is not astonishing that several studies investigated the factors to identify and improve the level of well-being (Bradburn, 1969; Leary, 2004; Ruff, 1989). Among those, self-esteem is considered a direct indicator. Self-esteem is defined as a person's positive or negative subjective evaluation of the personal value as a whole to be successful and valuable (Goldsmith, 1986; Orth & Robin, 2014; Rosenberg, 1965). However, available literature profoundly discussed the interaction between self-esteem and academic results (Booth & Gerard, 2011; Moss & St-Laurent, 2001); meanwhile, the connection between self-esteem and well-being of adolescents has not been fully articulated.

The attachment theory was first presented by Bowlby (1969). Bowlby (1969, 1997) proposed that the early attachment with the caregiver would have an impact on emotional and societal development in the future. Similarly, it would influence the quality of relationship ones maintain; and subsequently, their well-being. Different attachment styles were classified as secure attachment style and two insecure attachment styles including anxious (ambivalent) attachment style, and avoidant attachment style (Ainsworth, 1978; Aviezer et al., 2002). Given the fulfillment in need of emotional support from the initial caregiver, secure individuals grow in autonomy and are confident to explore the world outsides, also they enjoy closeness comfortably (Ainsworth, 1978; Aviezer et al., 2002). On the other hand, insecure attachment prohibits active discovering in new conditions due to an extant mindset from particular memories (Ainsworth, 1978). The anxious (ambivalent) individuals tend to be afraid of rejection or abandonment for not feeling they deserve love (Ainsworth, 1978; Aviezer et al., 2002). They have low in self-evaluation and are negative about their values so in close relationships, they depend extremely on other' acceptance (Levy et al., 2011). Last but not least, avoidant attachment style is demonstrated in a self-directed way presenting a strong self-reliance and a dismissive attitude towards close relationships (Ainsworth, 1978; Aviezer et al., 2002). They dislike intimacy experienced jealous feeling in a relationship (Hazan & Shaver, 2009). By the turn of the 21$^{st}$ century, Wilkinson and Walford (2001) extended the theory to peer attachment that refer to peers as influential sources of social and emotional support among adolescents. This highlighted the role of peers in the critical developmental stage of adolescence. In recent studies, it was indicated that the secure attachment style predicted positively the well-being outcomes, the insecure attachment styles are indicators of lower well-being status (Aviezer et al., 2002; Ein-Dor et al., 2011; Karreman & Vingerhoets, 2012; Parr et al., 2020; Pietromonaco et al., 2000; Wei et al., 2011).

Although attachment is closely related to the upbringing and development of children, it received little media attention and institutional support in Vietnam. According to UNICEF Vietnam (2018), the adolescent mental health problem record in Vietnam increased at an alarming rate causing subsequent outcomes including substance abuse (2018), suicide thoughts (Nguyen et al., 2013). Given the increase in the number of mental health problems, adolescence well-being has become a growing concern in Vietnam. However, previous studies in Vietnamese context discussed distress, anxiety and stress with limited resources about student life satisfaction or well-being (Thang et al., 2022). Additionally, peer attachment was much less concerned than familial relationship in measuring well-being (Karreman & Vingerhoets, 2012). Also, it was apparent that research on peer attachment, adolescent, and university student's well-being was scarce.

During adolescence, friends play an critical role in social communication and become a source for social and emotional support (Wilkinson et al., 2015). In the period of adolescence, the mutual time between parents and adolescents decreases significantly, while the time with peers increases (Gorrese & Ruggieri, 2012) so peer attachment is important to discuss when adolescents establish relationships with other people apart form their familial bonds (He et al., 2018). Additionally, self-esteem was synthesised as the consequence of one relating themselves with another in association with the contextual setting to decide on positive or negative evaluations (Fleming & Courtney, 1984) which was align with the attachment theory (Bowlby, 1969, 1997). Consequently, attachment provides the initial mechanism to understand how a person to relate to others in regulating emotions and behaviors in a social context. Comprehension of the connection of attachment and self-esteem prompts both theoretical and practical application in promoting self-evaluation and improve mental health condition for people.

**Different Attachment Styles and Psychological Well-being**

He et al. (2018) studied the parent and peer attachments of 941 Chinese adolescents in China found out that parent and peer attachment were not analogous and both had contributing impacts on psychological outcomes of adolescents. This blew a fresh insight into the perception about attachment and separation in parent and peer attachment styles. Despite interesting findings, the conclusion did not specify causality for psychological outcomes. Besides, adolescents were below 17, which excluded the later stages in adolescence; hence, the generalisation for adolescence may be misinterpreted. Also, gender was not observed as a fundamental factor, which limited a complete understanding of gender roles as an important social psychology related concepts (Rosander & Eriksson, 2012). From another point of view, Gorrese and Ruggieri (2012) reported that females were more closely attached to others than males either securely or anxiously.

Armsden and Greenberg (1987) first proposed that between peer attachment and self-esteem existed a optimistic connection in late adolescence. Although this robust findings provided the direction for further research, the participants in the first test and re-test were 86 and 27 respectively, leaving a sceptical view due to the sample size among critics. Another study suggested that peer attachment was correlated to self-esteem level among institutional students ($\beta = 0.23$) (Mota & Matos, 2013). This finding was consistent with results in structural equation modeling conducted by Laible et al. (2004). Both highlighted the relevance of attachment with peers and self-evaluation, indicating that the better quality of relationship supports the sense of security, hence, fosters self-esteem. However, the demographic distribution of genders in these studies was dominant females, which may impacts on the response bias due to gender roles.

The anxious individuals depend on others to value them as concerns about self and others lead to the reduction in self-evaluation. When receiving positive responses of others, they gained higher self-esteem; and vice versa. On the other hand, avoidant people do not rely on others for self-recognition so the other's assessment does not necessarily have a meaning. According to Foster et al. (2007), anxious attachment was highly associated with unstable self-esteem; whereas, avoidant attachment was not significantly related to stability in self-esteem. This introduced a new direction in measuring the stability of self-esteem in a longitudinal approach. However, this study on young and older adult population sample, which reflects the maturity in personality and social conformity. This direction would better

match for adolescent group as they have not fully developed a constant self-perception and are vulnerable to several changes.

Self-determination theory by Ryan et al. (2001) established an association between well-being and attachment styles. The level of fulfilment in three fundamental mental desires for autonomy, competence, and correspondence to other defines human well-being. Therefore, the level of attachment quality attributes to the well-being status of people. According to the attachment theory by Bowlby (1967, 1997), attachment provides a sense of belonging that increases the confidence and reduces the worry. For example, deep love and trustful friendship provide sources of happiness; also, the relationship at work shapes happiness (Haar et al., 2019.; Kim et al., 2020). These above stated relational aspects are globally endorsed in a cultural and religious perspectives (Ryff & Singer, 2008). In the life-span theory, adult developmental stage is accompanied by both intimacy as closeness to others and generativity as willingness to direct to others (Erikson, as cited in Ryff & Singer, 2008).

To date, several studies concluded that adolescents' outcomes in mental health, and well-being were closely connected to their friendship (Armsden & Greenberg, 1987; Balluerka et al., 2016; Karreman & Vingerhoets, 2012; Oldfield et al., 2016). To illustrate, Karreman and Vingerhoets (2012) reported that in a sample of 632 Dutch participants, secure attachment was found to relate with better well-being; while anxious attachment influences negatively on one's well-being. However, they also reported that avoidant attachment could positively anticipate the level of well-being. They argued that although avoidant attachment was an insecure style, it could possibly predict an increase in the level of wellness for a reason. People of avoidant attachment do not expect other’s opinion to evaluate themselves. Besides, they tend to be self-reliant and independent; therefore, they hold a strong belief in themselves and are not intefered by others. Unfortunately, this study covered a wide age range from 16 to 65, which made it difficult to produce a fair conclusion for all age groups so the findings remained skeptical.

Balluerka et al. (2016) presented a further support for the above theoretical framework that well-being increase was connected with higher secure attachment level among secondary students. In this study, correlation and regression tests at individual level and class level were conducted, which was reasonable and feasible for this population. They concluded that well-being reduced overall when adolescents grow older; however; there was a link between peer attachment and higher well-being. As a result, they highlighted the importance in promoting a class environment to assure the development of well-being through building up self-esteem and emotional intelligence rather than traditional deductive approach. However, this study imposed a limitation in the methodology as findings purely from quantitative data hindered generalisation for such a larger group of population and self-report measure faced obvious restriction in response bias. Nevertheless, this study on a big sample size contributed interesting results for the less-focussed domain of well-being and peer attachment.

## Self-Esteem and Well-being

Sociometer theory (Leary, 2004) defined self-esteem as an internal monitor of an individual's social acceptance and inclusion. Individuals with high self-esteem evaluate themselves as socially appreciated and accepted. This perception increases the level of the psychological well-being with positive emotions, life satisfaction, and application of coping strategies in difficulties. This argument is consistent with approach by Ryff (1989) in terms of analogous constitutional element of well-being. Demirtaş (2023) investigated the level of self-esteem and happiness among students of different faculties in Turkey. It was concluded that music

students had higher level of happiness and self-esteem in comparison to other groups. However, other students presented a higher level of self-competence but a moderate level in self-liking realm. This conclusion implied an association; however, only among music students and the impact of music may also be a confounding factor that was not explicitly discussed. Likewise, self-esteem was found to be positively related to the well-being among young adults in Italia (Matera et al., 2019; Nonterah et al., 2023). In these studies, researchers conducted correlational and regression analysis, so they could hardly conclude the direction of causality, which limited the practitional application from the research findings.

Both attachment styles and self-esteem have been compiled together in evaluating psychological wellness in adult population (Sechi et al., 2020), adolescent population (Gallarin & Alonso-Arbiol, 2012; Millings et al., 2012; Mota & Matos, 2013). The findings in those studies were consistent that secure peer attachment and higher self-esteem correlate with better quality of mental health. Sechi et al. (2020) concluded these variables as protection for female living quality; meanwhile, insecure attachment and low self-esteem predicted lower quality of lives. The population sample was all females, so it failed to reflect the reality of the mix-gender society. Additionally, in measuring peer attachment, self-esteem and depression level, Millings et al. (2012) reported that positive self-esteem and secure peer attachment style correlated negatively with the level of adolescent depression among 5022 teenagers from 11 to 16 in the UK. Similarly, Gallarin and Alonso-Arbiol (2012) disclosed an analogous tendency with agressiveness and anti-social behaviors. Those finding was critical and valuable for building up suitable intervention for young adolescents. Although those studied different aspects of mental health, the findings still implied that higher self-esteem and secure attachment correlated with elevated positivity and vice verse. These appeared to be coherent with the theory of attachment (Bowlby, 1969, 1997).

## Method

### *Participants*

Data was collected from first-year students at Hanoi University in the Falculty of English Language. To recruit participants, convenient sampling method was utilised for the suitability in the openess to acess, geographical vicinity and availability during researching time frame (Etikan et al., 2016). After excluding invalidated responses, 134 responses were collected for the survey. The mean age of participants was 19.9 (*SD*=2.06), in which mean of male age was 19.76 (*SD*= 2.47), mean of female age was 18.82 (*SD*= 2.89) and one participant (19 years old) prefers not to mention their gender.

### *Measures*

An online survey consisting of three main parts of measuring attachment styles, psychological wellbeing and self-esteem was designed. Besides, the turvey asked basic demographic information of participants. Online survey was helpful in the procedure of creating a questionnaire, storing responses and visualising data (Siva et al., 2019). All items in the Adolescent Friendship Attachment Scale (AFAS) (Wilkinson, 2008), Warwick-Edinburgh Mental Well-being Scale (WEMWBS) (Tennant et al., 2007), and Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965) were examined for the purpose of this study. The first scale, the Adolescent Friendship Attachment Scale (AFAS) was designed for self-report to evaluate the adolescent close relationship with their friend as an attachment figure in the society. The AFAS was reported to attain a high level of interal consistency. Cronbach alpha

value >.70 presents acceptable internal consistency (Wanous & Hudy, 2001). For this scale, Cronbach's alpha coefficients for each subscale in the AFAS are Secure (α= .914), Anxious (α=.810), Avoidant (α=.788), and overall (α=.916) (Wilkinson, 2008). Wilkinson (2008) evaluated the convergent and criterion-related validity and concluded that this scale attained a significant convergence ($r$=.667, $p$<.01) with peer attachment subscales in the Inventory of Parent and Peer Attachment (IPPA) (Armsden & Greenberg, 1987). This scale has been widely used in psychological studies since its publication and translated and validated in various languages including Italian, Chinese and Korean (Baiocco et al., 2017; Jiang et al., 2018; Lee et al., 2017). Secondly, the WEMWBS was constructed to measure the positive affect, interpersonal relationship and active functioning. The overall Cronbach's alpha was α = .83 for student sample and α = .91 for population sample, which indicated a significant internal consistency (Tennant et al., 2007). Besides, the test- restest reassure the reliability with high Cronbach's alpha coefficient α =83 (Tennant et al., 2007). Lastly, the Rosenberg Self-Esteem Scale (Rosenberg, 1965) of 10 self-report items with five negative and five affirmative statements developed to measure the perception of individuals about their values. Some studies discussed the dimensionality of the RSES to criticise the privilege of this scale in comparison with other multi-factor constitutions (Fleming & Courtney, 1984; Goldsmith, 1986). Although controversy exists, the global self-esteem attained a wide popularity for its reliability and validity. Regarding the internal consistency, Cronbach's alpha was reported to be from .86 to .93 (Goldsmith, 1986) and of .88 (Fleming & Courtney, 1984), both of which assure a high reliability of the RSES.

For the age range, all above scales were applied for adolescents, which matched with the age group of population in this study. Last but not least, the administrating advantages including being concise, time-saving meet the needs of this study purpose.

### *Data Analysis Plan*

After excluding unanswered responses, there were missing data in the dataset. Considering the missing mechanism (Little & Rubin, 2019), it did not affect the analysis whether missing or observing because the missing value in the dataset is not related to the values of variables. This feature was grouped as Missing Completely at Random (MCAR). Besides, it is necessary to make use of the most collected data when the research recruited small participants (Song & Shepperd, 2007). Therefore, Pairwise Deletion (PD) missing data ignoring technique was used. In other words, all recorded data enter statistical analysis; meanwhile, missing data were ignored (Strike et al., 2001). The statistical values were scored according to the original instructions of the instruments. In each instrument, for items with opposite semantic meaning, the values were reversed appropriately to be positively correlated with the traditional meaning of the scale (Barnette, 2000).

For items on a continuum, mean and SD were reported in tables and categorical items were reported in percentage. Test of normality and histogram visualisation were used to assure normal distribution of statistic. Reliability of each variable was checked via Cronbach's alpha to assure the internal consistency. After that, correlational analysis and regression were conducted for statistical analysis.

## Results

Within the scope of this study, the AFAS recorded overall Cronbach's value ($\alpha$=.72) and sub-scales: secure ($\alpha$=.88), anxious ($\alpha$=.64), avoidant ($\alpha$=.80), which also revealed good total internal consistency. The Cronbach's alpha for anxious was lower than previous studies,

which might be the results of responding patterns and cease cautions in interpretation in the analysis. However, regarding the overall quality, AFAS measure is suitable in terms of the scale reliability. Within the present study, the Cronbach's alpha of the WEMWBS and the RSES is .89 and.81 respectively. These values indicated that items in each instrument were consistent in measuring the construct of the scale.

Secure attachment style was recorded with numerical values (*M*= 2.93, *SD*= .52). In comparison to previous research, this sample had a lower Mean in Secure and higher standard deviation (Lee et al., 2017). Shapiro Wilk statistics for Secure score (*w*= .98, *p*= .264), in association with skewness (.31), kurtosis (.11) indicated a normal distribution. Regarding other attachment styles, anxious attachment style scores (*M*= 2.15, *SD*= .61) with males (M= 2.29, *SD*= .71) and females (*M*= 2.11, *SD*= .56). Shapiro Wilk statistic of anxious (*w*= .97, *p*= .068) bearing in mind the skewness (.58) and kurtosis (.78) provide evidence for the normality. On the other hand, it was evident that students were more significantly associated with avoidant attachment style (*M*= 3.10, *SD*= .69). Shapiro-Wilk test of normality indicated a deviation from normal data distribution (*w*= .97, *p*= .029) in avoidant scale. Given the deviation in data distribution of avoidant variable, non-parametric test of association Spearman's r was used to compute the correlation for avoidant and the variables of self-esteem and well- being.

In terms of self-esteem scale (*M*= 2.67, *SD*= .44), Shapiro Wilk statistic (*w*= .98, *p*= .187), skewness (-.01), kurtosis (.08) implied good evidence of the normality. According to descriptive data of self-esteem, males (*M*= 2.7, *SD*= .51) displayed greater self-esteem than females (*M*= 2.6, *SD*= .42). Generally, 83% students showed a positive attitude toward their selves. Far more than 50% of students agreed or strongly agreed to be satisfied with themselves, have good qualities, be able to do things well equally to other people, meanwhile 35%, 44%, and 45% of those felt that they were a failure, sometimes useless or no good respectively. What's noteworthy is that while 80% reported to wish they could have more respect for themselves., 17% did not have positivity of their own. Although these suprising statistics were at high rate, the statements were not representative but happened at time as stated in these items. In other words, students generally had positive emotions and confidence, however, those feelings were inconsistent. This self-reported evidence highlighted a direction for practitioners to integrate proper support to improve listed negative feelings.

In well-being scale, mean value was 2.67 (*SD*= .44) and Shapiro Wilk statistic (*w*= .98, *p*=.204), skewness (-.14), kurtosis (-.68) supported for data's normal distribution. Male students (*M*= 3.51, *SD*= 1.03) were at a higher level of well-being in comparison to female counter-part (*M*= 3.34, *SD*= .79). More than 50 percent of students reported that they often or always had positive feeling of being useful, optimistic, relaxed, confident and interested in others. However, about 30% of those who never or rarely thought positively about themselves.

### *The Relationship Among Peer Attachment Styles, Self-Esteem and Well-being*

From Pearson's r value analysis, the correlation coefficient indicated that there was not a significant correlation between secure attachment and self-esteem. However, it is worth noting that according to Schober and Schwarte's (2018) interpretation framework, the connection between anxious attachment and the level of self-esteem was found to be negatively and moderately correlated (*r*(178)= -.28, *p*= .014). About 7.8% of the variability in

statistical self-esteem was accounted for by the anxious attachment ($r2$ = .078). Besides, from the Spearman's correlation testing, avoidant attachment style was not significantly correlated with the level of self-esteem (*rho*(175)=.13, n.s).

The result showed that the relationship between secure attachment style and well-being was statistically significant ($r$(172)= .29, $p$= .015). The Pearson's r value ($r$=.29) suggests a moderate positive relationship between these two variables (Schober & Schwarte, 2018). Approximately 8.4% of the alterability in well-being was accounted for by the secure attachment ($r2$ =.084). Meanwhile, there was no significant correlation between anxious attachment and the level of well-being because p value= .148. Lastly, Spearman's r test of correlation showed that the association between avoidant attachment and the level of well-being was not found to be statistically significant because $p$ value= .726.

It was evident that a positive correlation existed between self-esteem and well-being ($r$(172)= .58, $p$<.001), indicating a strong and positive relationship between these two variables. Approximately 33,6% of the variance in well-being was by the self-esteem ($r2$ = .336).

### *Regression Analysis*

Multiple linear regression analysis was applied with well-being score as criterion variable and self-esteem and secure attachment as predictor variables. The residual errors proved no first order autocorrection (*DW*=1.8, $p$=.384) and Omnibus ANOVA preceded significant value because $p$ <.001 and $p$= .011 respectively for self-esteem and secure attachment. The connection between criterion variable and predictor variables illustrated a moderate connection ($R$= .66) with an adjusted $R^2$ of 42, indicating that 42% of deviation in well-being statistics could be predicted. Statistical evidence suggested that this relationship was significant higher than the chance level ($F$(2,164)= 24.94, $p$<.001). Both self-esteem and secure attachment were significant predictors for the level of well-being ($t$(164)= 6.51, $p$<.001 and $t$(164)= 2.63, $p$= .011 respectively). In particular, each adding unit in self-esteem could predict an extra 1.16 unit of well-being, whereas, an additional point in secure attachment could predict an increase of 0.4 unit in well-being.

From statistical analysis, self-esteem and well-being had a significant association. This supported the sociometer theory that self-esteem as a contributing factor for overall well-being of a person ( Leary, 2004). The findings presented evidence for valiadting the sociometer theory in Asian context with university population. This was also meaningful for interventions or project advancing well-being that self-esteem should be a core component to improve.

**Table 1.** *Multiple Regression Output*

*Model Fit Measures*

| | | | | Overall Model Test | | | |
|---|---|---|---|---|---|---|---|
| **Model** | **R** | **$R^2$** | **Adjusted $R^2$** | **F** | **df1** | **df2** | **p** |
| 1 | 0.66 | 0.44 | 0.42 | 24.94 | 2 | 164 | < .001 |

*Model Coefficients - Well-being*

| | | | 95% Confidence Interval | | | | |
|---|---|---|---|---|---|---|---|
| **Predictor** | **Estimate** | **SE** | **Lower** | **Upper** | **t** | **p** | **Stand. Estimate** |
| Intercept | -0.98 | 0.66 | -2.29 | 0.34 | -1.49 | 0.142 | |
| Self-esteem | 1.16 | 0.18 | 0.81 | 1.52 | 6.51 | < .001 | 0.61 |
| Secure | 0.40 | 0.15 | 0.10 | 0.71 | 2.63 | 0.011 | 0.25 |

## Discussion

### *Peer Attachment Styles*

Results of the peer attachment style survey (AFAS) presented that only 10.6% participants presented an anxious peer attachment, 32.1% indicated a secure peer attachment and 57.3% affirmed avoidant peer attachment. This meant avoidant attachment style was prevalent among all attachment styles among university students in Hanoi University, Vietnam. Participants in this population were at their late adolescence, which indicated they were independent enough to work and study and university friends may not be their only source of emotional support all the times. Therefore, the finding provided good illustration for the developmental stage in late adolescence in terms of self- regulation and interpersonal adjustment. Subsequently, it can be implied that university students do not indeed rely on their university friends for emotional and social support.

The percentage of people with secure attachment styles was lower than findings from previous studies in Western and Asian contexts. The mean score of secure in this scale was below other past research following the same scale (Lee et al., 2017). This finding should be interpreted carefully because it may be a result of cultural, familial and social factors. The parenting styles between Eastern and Western countries are way distinct (Nguyen et al.,2020), which may contribute to the formation of attachment styles. Oriental culture regards parents as main source of income of the family and it should be normal and ethical for children to obey and follow the instructions of parents to keep face for the family, work and show respect for the elders (Sung, 2010). This kind of practice put the relationship in family in line with a hierarchical order in stead of basing on care giving and affectionism. As a result, children either avoided sharing or being close to their parents, otherwise, they were afraid of punishment and wanted to stick to another adult to rely on for instant emotional

protection. These features are categorised into insecure attachment styles of avoidant and anxious respectively.

### *Self-Esteem*

Previous studies explored the level of self-esteem in various social contexts baring in mind the origin of adolescence as a contributing factor (Millings et al., 2012). They concluded that Asian descent students had significantly lower self-esteem levels in comparison with native English speaking students in a cross-cultural context. However, in Vietnamese context, the overall self-evaluation was proved to be higher than the average level of the scale, especially with general assessments. Therefore, the researcher proposed that in a social context of the same native culture, students gained more confidence and belief in themselves.

### *University Students' Well-being*

The percentages of negative well-being evaluation were found to be in line with previous fidings about mental health among Vietnamese youngsters (Thi et al., 2018). According to Thi et al. (2018), depression of first-year undergraduate students in Tra Vinh University were 39.9% and it followed an increasing pattern till the 4$^{th}$ year with significant p value ($p$= .0.019). It can be observed a similar prevalence in the low well-being report and depression level of university students in Vietnamese context. The percentage results showed a similar pattern with students' well-being report in Denmark, Finland, Iceland, and Sweden with more than 50% feeling positive and perceived good qualities in themselves while aroung 30% never or rarely experienced that positivity (Lyyra et al., 2021). Previous studies on student well-being compared the level of distress of students in year one, year two and year three (Bewick et al., 2010) yielded a particularly comparable trend. It was concluded that the level of depression was always higher than the time prior to enter higher education, which indicated a challenge in adjusting to university. Although this study was in the UK, the level of well-being among university students throughout university time was proportional with statistical report in Vietnamese context. Subsequentlly, there exists a raising concern that in the upcoming time, this population would undergo a lower level of well-being accompanied by higher depression.

### *The Relationships Among Peer Attachment, Self-Esteem and Students' Well-being*

This study's finding supported previous results from several studies that self-esteem and well-being had a significant association (Blank et al., 2016; Leary, 2004; Lynn, 2009; Millings et al., 2012; Peng et al., 2019). Although these studies were conducted in diverse population of adolescents and adults, the conclusion converged the connecting pathway of these variables. Regarding peer attachment styles, previous findings synthesised comparable results that anxious attachment was associated with lower self-esteem (Aviezer et al., 2002; Marshall & Mazzucco, 1995; Millings et al., 2012; Sechi et al., 2020; Wilkinson et al., 2015). It was statistically evident that avoidant peer attachment style was significantly correlated with the level of psychological well-being in this study, which deserved future investigation into the confounding factors for better insights.

## Conclusion

It is worth-noting that the avoidant attachment style was dominant among university students. The correlational test outcomes demonstrated that anxious attachment was negatively correlated with self-esteem scale, which supported for attachment theory (Ainsworth, 1978; Bowlby, 1969) and self-determination theory (Ryan et al., 2001). Therefore, this finding confirmed the above theoretical viewpoints in Vietnamese context. From statistical analysis, self-esteem and well-being had a significant association. This backed up the sociometer theory that self-esteem as a contributing factor for overall well-being of a person ( Leary, 2004). The findings supported validating the sociometer theory in Asian context with university population. However, there was not a significant correlation between secure attachment and self-esteem in this study, which was different from previous research. Possible confounding factors for this outcomes such as origin, year of relationship, gender and so on could impact on the level of connection between two variables. That said, both were correlated to well-being in general, indicating a bridging connection for positive psychological features.

These findings were limited by several factors. Self-reported data from questionnaire survey may mitigate the validity (Wilkinson & Parry, 2004). This likely resulted in underestimating some data as confounding factors.

In summary, this report has increased the awareness of the university students' well-being in Vietnam and provided a direction to support school managers and policy makers in fostering student well-being not by approaching it as a single target in educational settings but through promisingly promoting secure attachment and self-esteem. Future research should on the construct of student well-being and varied indicators to identify explicit components to boost student's well-being for practitional purposes.

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# *Correlates of Affectual, Associational and Functional Solidarity Among Digitally Literate Adults*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**

People in the society and workplace needs to conduct well by appreciating one another and not criticizing as there must be solidarity. This will ensure social cohesiveness and harmony. However, this remains an issue as there are personal and environmental constraints such as needs that are unattained, opportunities that are not captured and cultural structures that are not contextualized mindfully. The integration of Mindfulness, intergenerational solidarity and relational-cultural theories would prove helpful in achieving intergenerational solidarity as needs are met, culture is contextualized well and opportunities are captured well. A study of 279 digitally literate adults employing quantitative method (means, standard deviation and Pearson r) from three sets of questionnaires measured the hypothesized correlates (needs attained, opportunities captured, cultural contextual structures,) to affectual, associational and functional solidarity were employed. Findings equally prove high mean values for all facets of solidarity as affectual (3.99), associational (3.60) and functional (3.61), explaining 23 %, 14% and 13% of the variance. There were significant correlations among needs attained (0.56), opportunities captured (0.50), cultural contextual structures (0.51) to all facets of solidarity 0.001 probability accepting the hypotheses. Findings infer that personal and environmental factors correlate significantly with solidarity. Implications for learning support and future directions are forwarded.

Keywords: Correlates, Cultural Contextual Structures, Mindfulness, Relational-Cultural Theory, Solidarity

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## Introduction

Across generations, the practice of giving and receiving is observed but there is lacking in appreciation and oneness in the toil, groups are not solid (Llorito, 2020). This is a trend that transpired in media posts: help seeking, giving and taking between the more capable and the less capable members of the human race but adults who claim to be digitally literate do post complaints and groans rather than cooperating and cohering with others (Beaujot & Ravanera, 2008). To Tai, Ajjawi, & Boud, (2018) these ar manifestations of *intergenerational tension* expressing unattained needs, opportunities that are not captured and appreciated, and relationships that are not contextual and culture bound.

The trend calls for minding the affect or value of solidarity especially among professionals who tend to stray away from each other than becoming cohesive, sympathetic and understanding (Llorito, 2020). This situation depicts dearth of *solidarity* between and among the more digitally literate adults (The Reader 2010). Literature is silent and unclear whether what is given is what is really needed and appreciated and thus yield satisfaction and self-fulfillment (Kuranchie-Mensah, Boye; Kwesi, 2016). Givers see in gifts and other provisions as uplifting their own morale but, receivers tend not appreciate fully such giving, as posts and blogs present complaints than otherwise. Even as needs are provided, it seems on the part of the receivers, there is more that they expect. Seemingly, there is a need to be mindful of one's personal and environmental circumstances such that oneness or cohesion may be ensued (Vansteenkiste, Ryan & Soenens, 2020). Mindfulness would yield the state of solidarity among individuals who would show such concern of each other's welfare.

*Solidarity* refers to the value of agreeing, uniting, harmonizing with others and yield the actualized state (Taylor-Gooby, 2011). That the receiver gets what would fulfill his desire, while the giver feels fulfilled at his act of giving. This is gleaned in the provision of wellness, sustenance and satisfaction and attain mutual appreciation (Galuschek, 2017). The state of *mindfulness* about one's self, environment, culture must be reflected and requisites to the attainment of solidarity needs to be explored.

Liu (2017) put in digitization as separating individuals than binding them. Frega (2019) pointed that solidarity must permeate in the levels of individual, family and society. Individually, it relates to one's valuing of reflections and effort to reach out to others (Sharma, 2013; Ferrera & Burelli, 2019). On a family level, solidarity is attained in fulfilling the family's needs first and then reach out to neighborhood to show such concern about other's welfare. On a societal level, solidarity depicts a fulfillment of a group of families, leaders and people's organization (de Miranda & Snower, 2020). These are stages where solidarity should permeate, it would however be best if the affect will be explored among the more literate adults who are knowledgeable of the existence and non-existence of the affect.

*Mindfulness theory* posits reflections on the self and of others, thus intrinsic and extrinsically observing what best present the self well (Adarves-Yorno, Mahdon, Schueltke, Koschate-Reis, & Tarrant, 2020). Mindfulness is a mental state that is achieved by focusing one's awareness on the present moment, while calmly acknowledging and accepting one's feelings, thoughts, and bodily sensations (Carpenter, Conroy, Gomez, Curren, & Hofmann, 2019). Mindfulness means working out solutions to observed problems by exerting best foot forward and be appreciating than criticizing. It would yield harmonizing with others and exerting concern of other's welfare (McGann, 2021).

Individuals in societies possess needs ranging from the lower ones -food, clothing, shelter, money, livelihood to higher ones: social, esteem, love, aesthetic up to self-actualization (Perrotte, Shattuck & Daniels, 2021). As these are attained among individuals, solidarity is sure to result. *Needs* are necessities which if attained would yield better living (McLeod, 2020). A survey of needs points out to the more biological needs undermining the deeper person whose internal being is empty and longs for intrinsic gratification (Kenrick, Neuberg, Griskevicius, Becker & Schaller, 2010). Tay and Diener (2011) tested Maslow's theory and forwarded a universal existence of the need for self-actualization that is fulfilled no matter how low other needs are met. That people possess such a deep desire to be at peace with himself and his environment, a kind of solidarity that cannot be fulfilled externally but internally by the more reflective and helpful ones (Lu, 2001).

*Opportunities* refer to the chances of growing and expressing oneself in a particular locale (Marks, Barnett & Strugnell, 2015). These opportunities are observed in educational, exposure, job, child care, travel chances, financial capability, presence of social contacts, knowledge of possible sponsors to projects, digital literacy, faith in the Almighty, social status, deep connection to life, equitable government support, work ethics and other kinds of opportunities that may be rendered to individuals, families and societies. Pradhan, Fischer, van Velthuizen, Reusser & Kropp, (2015) forwarded the claim that a wealth of knowledge is gained from capturing opportunities in the environment as one be mindful of his potential. Individuals in the society should be able to capture opportunities such that the affect solidarity is effected (Jordan, 2017; Shogren, Singh, Niemiec & Wehmeyer, 2017).

*Cultural contextual structures* refer to ways of life, standards and styles that characterize a particular group of people (Coyne, 2016). The politics involved and the state of economy, with the laws and customs are elements of cultural-contextual structures (Szydlik, 2012). Donald, Sahdra, Van Zanden, Duineveld, Atkins, Marshall, Ciarrochi (2019) pointed out that mindfulness has a positive effect in prosocial and helping behavior, by being non-judgmental to someone's experiences. This is where cultural structures respond to needs, presents opportunities and promote finest relating with one another (Marks, Barnett, & Strugnell, 2015; Merkes, 2010). Creswell, Lindsay, Villalba, & Chin, (2019) reiterated the structures that should be understood by adults in order to yield solidarity.

*Intergenerational solidarity theory* frames both specific and generic behavior of belongingness and close bonds between generations (Szydlik, 2012). The theory involves a series of facets that can be classified into three dimensions as: *Affectual solidarity* (Hwang, Yoon, Silverstein & Brown, 2019) referring to emotional closeness, *associational solidarity* (Fleming, 2021) which refers to common activities shared by a group of people and *functional solidarity* that entails giving and taking of money as well as time and space (Krems, Kenrick & Neel, 2017; McLeod, 2020).

According to Szydlik (2012), help, care and bequests are a form of functional solidarity that are given by the more capable ones and those who have attained the self-actualized status. Accordingly, there is connection between individual needs and opportunities where families and cultural contextual structures serve as precedents to the attainment of solidarity.

*Relational–cultural theory* would prove worthy of integration, because people grow through and toward relationships throughout their life span (Garcia-Guerrero, Lopez, Gonzales & Ceular-Villamandos, 2021). These interpersonal connections are built on mutual empathy and zest, clarity, worth, creativity, and the desire for more connection. Thus, if relational and

cultural longings are addressed, acute interpersonal disconnections would provide opportunities for growth, in contrast to chronic disconnections that create isolation and disempowerment. Relational–cultural theory provides the rationale that would guide therapeutic practice and the pursuit of social justice (Jordan, 2017).

The fusion of relational-cultural to intergenerational and mindfulness theories would produce the solidarity state among adults. Mindfulness would mean reflecting well on circumstances and its roots or sources such as the needs attained and opportunities captured (Garcia-Guerrero, et.al, 2021). Mindfulness means being able to respond appropriately to the changing circumstances while at the same time being helpful and concerned about humanity (Adarves-Yorno, et.al, 2020). Additionally, underscoring relations and culture would provide such understanding of one's way of life and then actions would be based on what would be best appreciated and maintain harmonious relationships (Krems, Kemrick & Neel, 2017). If these be assimilated and applied, there would be noteworthy jump start of a better and more concerned populace and this solidarity is a legacy to continue on among generations. No such study where these theories are integrated and tested is made thus reflecting dearth of the most integral value or affect – solidarity.

It is a fact that simplicity of living is evident in the earlier years. There were then more concerned populace or neighborhood and people had simple needs and there were harmonious relations with one another. Szydlik (2012) put it well that needs attainment may be the lone action that may sustain solidarity. That community needs once attained and fulfilled do actually serve the main basis of all kinds of solidarity as affectual, associational and functional. It is therefore high time to reflect backward on those simple ways of living and acknowledge such simplicity of life as the most essential. However, opportunities captured equally proves to be requisite to solidarity, as opportunities inspire individuals to persevere. Cultural contextual structures equally yield a concern among the populace who should be bounded by common values and life ways.

A niche is herein attempted to be filled-up: identifying and exploring the more significant factors or correlates to solidarity such that cohesion is achieved (McGann, 2021). As parents and adult children are connected across life courses – from cradle to grave, thus the need for an exploration that will provide worthwhile intervention programs that will attain solidarity and therein be productive in this digitally advanced society (Bellamy, 2019).

Conceptually, this endeavor would put in needs attainment, opportunities captured, and cultural contextual structures as the independent variables or the correlates, while affectual, associational and functional solidarity are the dependent variables that are effected in minding the aforementioned correlates. The aim is to describe the relationship of the independent variables to the aspects of solidarity quantitatively.

## Method

This study employed a quantitative, correlational study describing the relationship between the independent variables: needs attained, opportunities captured, and cultural contextual structures to the dependent variables affectual, associational and functional solidarity.

### *Participants*

The participants of the study are young adults and citizens of the country who are in their productive years (19-39 years old), male or female, and in whatever civil and social status. A screening criterion would be their use of gadgets. A total of two hundred seventy-nine (279) participated in the study, a sample that is sufficient for this correlational study (Dell, et.al, 2002). The participants were aged 19-24 (84%) and 25 & above (16%); males are 27% and females are 72%. In terms of civil status 99% claimed to be single while 1% with partner, all these are digitally literates. Their source of income are economic support (66%) and work pay, and business and subsidy (34%). The average daily family income is 63% for less than P500 and those having more than P500 is 37%. In terms of number of dependents, those having 0-4 are 85% and those who have 5 and above are 15%.

### *Instruments*

The constructs of the study were measured thru item-pooled and author constructed questionnaires converted into google forms for full utility and after intensive content analysis. The first part contained demographics that looked at age, sex, civil status, source of income, average daily income, number of dependents (parents or kids). The questionnaire that was in google form was accessed after informed consent among the randomly sampled or volunteered digitally literate respondents.

The second part was a survey of Opportunities where a mindful respondent would state extent of capturing environmental opportunities. This was responded thru a scale ranging from 1 to 5, where 1 means to a less extent and 5 means to a great extent; there were seventeen (17) items, with a sample item, *"there are job opportunities available for you."*

The third part was *needs assessment inventory* that equally underwent content validation. The questionnaire comprised twenty (20) items answered in a scale of 1-5 where 1 means to a least extent and 5 means to a great extent. A sample item reads, *"As an individual, you feel the need for clothes that fit you well."*

The fourth part were items on Cultural Contextual Structures (CCS), there were ten (10) items, answered in a scale of 1 to 5 from strongly disagree to strongly agree. A sample item reads, *"you see your environment as having a way of life that fulfils your desire".* The final part of the questionnaire was solidarity items that equally underwent content analyses forty (40) items. A sample item reads, "*you see yourself happily connected with your entire family.*"

Responses to the question items in sections were subjected to reliability coefficients which produced highly acceptable values ranging from 0.75-0.92.

### *Procedures*

This endeavor started with conceptualization to the presentation of the full-blown proposal. As the proposal was accepted, content validation of the instruments was conducted after expert evaluations. As this is a first phase study, basic research in descriptives were finetuned to prove the hypotheses that these are the most important correlates to solidarity.

### *Data Analysis: Ethical Consideration*

The entire conduct of the study adhered to the ethical principles of confidentiality and anonymity ensuring that no risks is effected in any form to anyone specially with the participants of the study.

Data were managed through an Excel spreadsheet downloaded from the google sheet, cleaned and put variable names. Jamovi software was utilized in describing central tendencies, percentage and correlations.

## Results and Discussion

The first problem looked into the digitally literate adult's level of perceiving *Needs attained, opportunities captured,* and *cultural contextual structures*. Table 1 presents the results.

*Table 1*. **Digitally Literate Adults' Level of Perceiving Correlates to Solidarity**

| Correlates | Mean | SD |
|---|---|---|
| Needs attained | 4.16 | 1.03 |
| Opportunities | 3.56 | 1.03 |
| Cultural Contextual Structure | 3.46 | 0.94 |

*N=279; min -1, max-5*

Table 1 shows the respondents' level of perceiving the hypothesized correlates to solidarity such as needs attained, opportunities captured, and cultural contextual structures. Table shows the mean values and standard deviation of the correlates. Needs attained yielded a *mean score of* 4.16, *sd*= 1.03 being the highest value (Aleshire, 1988). This infers that as needs are attained at one deviation away from the mean, solidarity is attained. Opportunities captured yielded a *mean* value of 3.56, *sd* = 1.03. This infers capturing environmental opportunities is a sure way to attaining solidarity. Finally, as cultural contextual structures (*mean* = 3.46, *sd*= 0.94) are acknowledged, digitally literate adults would equally acknowledge solidarity. They would appreciate and find their way to be the givers who would feel good at the act of giving cohesively.

There is a need for mindfulness about the availability and access of both personal and environmental resources in order to draw on these when working for something worthwhile and contribute to the betterment of the humanity. Beaujot & Ravanera (2008) put across the need for change that must arise within the self then to the family to effect solidarity. Szydlik (2012) and Garcia-Guerrero, et.al, (2021) had put it well that needs must be addressed and opportunities must be captured to produce a society that is exemplifying the value of solidarity.

The second problem looked into the digitally literate adults' level of attaining affectual, associational, and functional solidarity, table 2 presents the results.

*Table 2.* **Levels of attaining solidarity**

| Solidarity | No of items | Mean | Level | Variance % | Cumulative % | Description |
|---|---|---|---|---|---|---|
| Affectual | 17 | 3.99 | 0.64 | 22.93 | 22.93 | Highly acceptable |
| Associational | 13 | 3.60 | 0.58 | 14.01 | 36.94 | Moderately acceptable |
| Functional | 13 | 3.61 | 0.52 | 13.21 | 50.15 | Moderately acceptable |

*N=279, Varimax rotation, cross loaded items deleted*

Table 2 presents the digitally literate adults' level of attaining solidarity in its facets affectual, associational and functional. Table shows high means for all facets of solidarity as affectual (3.99), associational (3.60) and functional (3.61). Table equally shows highly acceptable items for affectual solidarity explaining 23 % of variance, moderately acceptable items for associational solidarity, explaining 14% of the variance, and moderately acceptable items for functional solidarity as responses to the items explain 13% of the variance. This confirms the facets of solidarity as well as the level of perception by the digitally literate adults sampled.

Confirming Hwang, Yoon, Silverstein & Brown, (2019), affectual solidarity relates to one's concern about other's feelings, as minding other else's perspectives on situations. Similarly, associational solidarity referring to the sharing with others on activities and actions that are deemed maintaining cohesiveness among group members is noteworthy. Szydlik (2012) is equally confirmed in that community people and family members must act in accordance with what is deemed functionally helpful with one another, such that appreciation is ensured.

Intergenerational solidarity aimed by the more concerned populace specifically digitally literate adults is gleaned in rendering support, caring for others, providing what is needed and appreciated (Krems, Kenrick & Neel, 2017; McLeod, 2020). Prior to this must be assessment of one's affect and capability to care and sincerely give and do in order to achieve peace and prosperity (Szydlik, 2012). A nation must be packed with principles and concerns about individuality, tied by values that promote oneness and cohesiveness, thus solidarity. Such capability and willingness to reach out to people who are in dire need of attention and support must be borne within the more capable members of the society, the digitally literates (Hwang, Yoon, Silverstein & Brown, 2019; Szydlik 2012).

The next problem looked into the relationship between needs, opportunities, and cultural contextual structures to affectual, associational and functional solidarity, table 3 presents the results.

*Table 3.* **The relationship of the correlates to the facets of solidarity**

| | Needs Attained | Opportunities Captured | Cultural CS |
|---|---|---|---|
| Affectual S | 0.56*** | 0.50*** | 0.51*** |
| Associational S | 0.45*** | 0.46*** | 0.64*** |
| Functional S | 0.37*** | 0.41*** | 0.52*** |

*Sig <.001*

Table 3 presents the correlations between and among needs attained, opportunities captured, and cultural contextual structures to the facets of solidarity as affectual, associational and functional. Table shows significant correlations among needs attained, opportunities captured and cultural contextual structures to all facets of solidarity and all significant at 0.001 probability. Correlations are herein interpreted as: a unit attainment of needs yields an increase of 0.56 in affectual solidarity, 0.45 in associational solidarity and 0.37 in functional solidarity. Similarly, a unit increase in capturing opportunities yields an increase of 0.50 in affectual solidarity, 0.46 in associational solidarity and 0.41 in functional solidarity. Finally, a unit increase in understanding cultural contextual structures would yield an increase of 0.51 in affectual solidarity, 0.64 in associational solidarity and 0.52 in functional solidarity, all significant at .001 probability.

Confirming McLeod, (2020) needs that are met hierarchically would ensure the *affect* of solidarity, as individuals would not be in tensed state. Kenrick, et.al, (2010) and Tay and Diener (2011) have put it well that the universal existence of the need for self-actualization is fulfilled when one possesses such awareness of his environment, a view of relating with one another and is fully reflective about his thoughts and actions. As people are mindful and in the context of culture, they would realize the significance of simplicity and mutual concern (Szydlik, 2012; Lu, 2001).

Pradhan, Fischer, van Velthuizen, Reusser & Kropp, (2015) are confirmed as *opportunities* captured would relate to solidarity in its facets. When opportunities are well communicated, adults would take the chances of making themselves productive. The more significant correlates are the positive constructs referring to the self and the environment, the efficacy or such strong capability in an individual as well as seeing those chances and opportunities in the environment (Marks, Barnett & Strugnell, 2015).

Further confirming Szydlik (2012), *cultural contextual structures* relate to all facets of solidarity, an understanding and drawing from reflections of these structures would do well in establishing the better version of the self and thus relate well with others. Solidarity may be attained after a crisis and reflections of circumstances. Confirming Ferrera & Burelli (2019) who put in attainment of solidarity when there is mindfulness and conscientiousness among the more capable adults of the society, concern must be expressed and appreciated.

## Limitations

The present study is able to capture the salient and essential correlates to solidarity as needs attained, opportunities captured, and cultural contextual structures and then explored the three reliable facets of solidarity as affectual, associational and functional. It was bounded by time as well as robust sample that would have exhausted data. Furthermore, it could have been more exhaustive if the data gathering was conducted personally than online. Similarly, the study is limited to online interactions than personal, thus the expression of the affect has made it shallow. Interviews may have elevated the findings if this be conducted.

## Conclusion: Implications

The integration of the three theories: intergenerational solidarity, mindfulness and relational-cultural theories are proved to achieve solidarity – a higher level of value or virtue. As adults are mindful of their being, they reflect and work on attaining their needs as well as capture and communicate opportunities. As needs are attained, there arises affectual, associational

and functional solidarity. Similarly, as opportunities are captured, solidarity is attained. Cultural contextual structures would attest the need to consider cultural ways of life and relations between the more capable and the more in need of help.

This learning must not remain an awareness but must compel actions that would benefit the society by having people who serve as role models to exemplify finest values in life. If this be attained, intergenerational solidarity would not be impossible as it is initiated and exemplified by the more capable and caring adults. Socially, people desire for the attainment of their needs which are qualified to be the more basic or essential, these must be provided by the more capable ones. Opportunities must be communicated on and encourage the populace to partake as this will ensure productivity and solidarity.

## Funding

This work was supported by the Bulacan State University Research Management Office in 2022.

## Acknowledgment

The authors acknowledge the generous support of the Bulacan State University particularly the Research Management Office in the making and completion of this research endeavor. Also, to Mr. Salvador Yanga and Mr. Clemuel Cruz for the assistance they rendered in the statistical analyses. Lastly and more importantly, the guidance and wisdom provided by the Almighty God as well as friends, colleagues and students who took part as participants to the conduct of this work.

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# *How Supervisor Can Retain Potential Employees: Psychological Empowerment as a Mediator*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
This study aims to examine how psychological empowerment can explain the role of supervisor support in reducing turnover intention especially for prospective employees. Turnover intention is an individual's desire to leave the company or current place of work. Psychological empowerment is an individual's intrinsic motivation to feel empowered at work. Psychological empowerment has four aspects: meaning, competence, self-determination, and impact. Supervisor support is an employee's perception of the extent to which superiors provide information, emotion, and assistance. Participants in this study were 150 employees who work in the field of insurance and technology & information with a minimum working period of 6 months, have a boss and minimum education of senior high school or equivalent. The data collected by using turnover intention scale, psychology empowerment scale and supervisor support scale. The design of this research is quantitative research. The result of this study show that there is a role of perceived supervisor support on turnover intention and it was also found that psychological empowerment can fully mediate between perceived supervisor support and turnover intention.

Keywords: Psychological Empowerment, Supervisor Support, Turnover Intention, Employees

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## Introduction

Recently, the number or percentage of employees who have left their companies and been replaced by new employees within a certain period of time is one of the main problems faced by the company (Larner et al., 2017). The phenomenon of individuals withdrawing is called turnover or what we usually know as leaving or stopping work. Based on the data taken from the research location, it was found that there was an increase in the turnover percentage from 2021 to 2022, in the amount of 17%. Turnover begins with the employee's intention or desire to leave the job. The intention or desire to leave this job is also called turnover intention. Turnover intention or intention to leave work is an individual's intention or desire to leave the company or place where they work (Mobley et al., 1978).

Pransuamitra (2022) states that 40% of workers in the United States have this desire to resign from their current job in the next 3 to 6 months. Based on a preliminary study through short interviews conducted by researchers with 5 employees in Jakarta, 3 of them stated that they had the desire to leave the company they currently work for several reasons such as looking for better opportunities or trying something new for getting a comfortable workplace.

However, not all individuals have the desire to stop working. Some individuals actually have the desire to remain employed at their current company for reasons such as being satisfied with their current job (Marmo & Berkmen, 2020), trust and also appreciation given by companies to individuals (Putri, 2022).

Pawesti and Wikansari (2016) stated that the desire to leave work predict to increase courage to violate work rules/conditions, courage to oppose or protest to superiors, and increasing absenteeism/absenteeism from work, to neglecting work for the sake of interests look for job vacancies elsewhere. Therefore, the desire to leave work needs to be anticipated. The anticipation can be done by identifying the factors that cause the intention to change jobs.

Research conducted recently (Afzal et al., 2019; Gaan & Shin 2022) found that self-efficacy is one factor in the intention to leave work. Self-efficacy is an individual's belief in the ability to organize and carry out the actions necessary to manage an existing situation (Bandura, 1995).

Furthermore, self-efficacy is predicted by supervisor support (Pati & Kumar, 2010; Albrecht & Marty 2020). Superior support is a situation where employees have a perception that the supervisor or superior appreciates the contribution and also cares about the employee's welfare (Eisenberger et al., 2002). Afzal et al. (2019) found that self-efficacy was an intermediate mediator intention to leave work with the support of superiors. The higher the support from supervisors, the higher the self-efficacy, and a lower desire to leave work.

Although self-efficacy functions in predicting (reducing) intentions to leave work, self-efficacy also can trigger individuals to leave work (Rohmawati, 2018). Employees who feel capable of carrying out their duties perceive themselves as having the potential to be accepted for work or easy to get a better job. Thus the role of self-efficacy as a mediator between supervisor support and intention to leave the job becomes inconsistent. Sometimes self-efficacy can be a factor which reduces the intention to leave work, but self-efficacy can also increase the intention to leave work. Therefore, the effectiveness of self-efficacy as a mediator needs to be considered.

Researchers propose that apart from self-efficacy, there are psychological empowerment variables that can be used as a mediator between supervisor support and intention to leave work. Psychological empowerment is an intrinsic motivation that reflects the individual's role at work (Spreitzer, 1995). Jose and Mampilly's (2015) research found that psychological empowerment has a significant correlation moderately strong with perceived supervisor support, $r(175) = 0.51$, $p < 0.01$). In addition, Akgunduz and Bardakoglu (2015) stated that psychological empowerment has a fairly strong correlation with intention to leave work, $r(330) = -0.57$, $p < 0.01$).

Based on the description above, in this research the author intends to test and explain what is the role of psychological empowerment as an alternative mediator besides self-efficacy in relationships, supervisor support and intention to leave the job. It is hoped that this research can make a contribution or complete the explanation of research conducted by Afzal et al. (2019). Practically speaking, hopefully this research will be useful for company managers, especially in the technology sector to retain potential employees.

This research refers to research conducted by Afzal, et al. (2019) because the research model is the same, but there are differences in the subjects and organizational industries studied. The subjects in this research were employees who worked for an insurance company and IT in Indonesia, while the research subjects of Afzal et al. (2019) is a lecturer at one university in Pakistan. This research took subjects from staff level to managers, both permanent employees full-time and non-full-time employees.

## Method

### *Participant*

Participants who took part in this research were employees who actively worked in Jakarta with a minimum work period of 6 months, have a supervisor and a minimum of education in SMA/SMK/equivalent. There were 164 participants who filled out this research questionnaire. However, After further review and research, only 150 participant data could be used for this research. The sampling method used in this research is non-probability sampling convenience sampling where sample selection is carried out based on participant availability and ease of getting it.

In this study, the ratio of male participants was 52.6% (79 participants). Age group of participants in this study consisted of 18-28 year olds 60.7% (91 participants), 29-40 year olds 36.0% (54 participants) and aged 41-55 years was 3.3% (5 participants). From the general description, education's background is quite diverse which 2.7% (4 participants) participated in this research, starting from SMA/SMK/equivalent level. diploma level 11.3% (17 participants), bachelor level 83.3% (125 participants) and master level amounted to 2.7% (4 participants). For the employment status section, 56.7% (85 participants) are contract employees and 43.3% (65 participants) are permanent employees. Judging from the duration, there is a quite significant comparison in length of work, namely employees whose work period is less than 5 years 89.3% (134 participants) and 10.7% (16 participants) were employees who had worked 5-10 years.

### *Instruments*

The data were collected by using three instruments which are turnover intention scale, psychology empowerment scale and supervisor support scale.

***Turnover Intention*.** In this research, measuring instruments were used which have been adapted by the Department Tarumanagara University Faculty of Psychology Research and Measurement from the Turnover Intention Scale (TIS) Cohen (1999). The measuring instrument used is unidimensional which includes 3 (three) indicators, namely organization, work and employment. The operational definition of turnover intention is getting higher. The score from the job turnover intention scale will give an idea that the individual will feel more confident and wants to leave his job at his current place of work. This measuring instrument has 10 statement items consisting of 6 positive statements and 4 negative statements. Examples of positive statement items are, “Dalam waktu singkat, saya berencana meninggalkan tempat saya bekerja saat ini.” Example of a negative statement is, "Saya berpikir untuk tetap bekerja di tempat saya bekerja saat ini." Measuring instrument It uses 4 Likert scales. The greater the food score, the greater a person's desire to eat and leave his place of work. This measuring instrument has Cronbach's alpha $\alpha = 0.91$ (Setiawan, 2021) which means this measuring tool measures job turnover intentions well.

***Supervisor Support.*** This research uses a measuring instrument adapted by Eisenberger et al., (2002). This measuring instrument has 14 statement items which are unidimensional. Operational definition of perceived superior support is the higher the employee's perception score towards their superior's support, the better employees perceive the support provided by their superiors in their work. Example The positive statement item is, "My supervisor is willing to provide various assistance when I experience this difficulty.". An example of a negative statement is, "My boss cannot tolerate even the smallest mistake whatever I do.”. This measuring instrument uses a 7 (seven) Likert scale to select answers. The greater the eating score, the greater a person's desire to leave his workplace. The Cronbach alpha reliability test value of the measuring instrument is $\alpha = 0.85$ (Ladebo, 2008), so the instrument measures your superior's support well.

***Psychological Empowerment.*** This research uses a Psychological Empowerment measuring instrument Scale (PES) adopted by Spreitzer (1995). This measuring instrument consists of 30 statements of a multidimensional nature consisting of 4 (four) dimensions, namely meaning, competence, self-determination and impact. The first operational definition of psychological empowerment is that the higher the dimension score meaning, the more meaningful and significant the work carried out is for the individual. Example items The statement from the meaning dimension is, "My work makes me disciplined". Definition operational competency dimension (competence) is the higher the competency dimension score, the Individuals will increasingly feel capable or skilled in carrying out their duties and work. An example of a statement item from the competency dimension is, "I have great responsibility in my work ”. The operational definition of the dimension of self-determination is increasing. The higher the score on the self-determination dimension, the more individuals feel able to control their work. An example of a statement item from the self-determination dimension is, "I was given the opportunity to decide for myself how to do my job.” Operational definition of dimensions The final aspect of psychological empowerment is the impact, the higher the impact dimension score, then individuals will be increasingly able to influence work outcomes in the workplace. Example items the statement from the impact dimension is, "I have access to be able to serve many people". The greater the eating score,

the greater a person's desire to leave his workplace. The Cronbach's alpha reliability test value of the four dimensions of the measuring instrument is α = 0.80 (self-determination) s.d. 0.85 (impact) (Wang, et al., 2021). Thus, it can be said that measuring instruments. The Psychological Empowerment that will be used has good reliability.

## Results

In this research, researchers conducted analysis tests on three variables. Researchers conduct testing hypotheses using a mediator model to see indirect relationships (indirect effect) on perceived supervisor support and intention to leave work with psychological empowerment as a mediator.

In carrying out data analysis in this research, researchers used the SPSS 26 program for carry out a linear regression test. Meanwhile, for the mediation analysis process, researchers carry out data processing with the Bootstrap method using PROCESS c3.5 by Andrew F. Hayes via SPSS 26. In mediation testing, the Bootstrap method has advantages over the Sobel Test method because it can perform testing in multi-level models very well for research with small samples and if the research data is not normally distributed (Preacher & Hayes, 2004).

First, researchers conducted a direct test between the variables perceived supervisor support and individual intention to leave work using linear regression and the value obtained is R2 = 0.145; = -0.381with a significance level of p < 0.01, it means that the variable perception of supervisor support has a role amounting to 14.5% of the intention to leave work with a value of $\beta$ = -0.381 which illustrates the existence direct relationship between perceived supervisor support and intention to leave a job (direct effect). The higher the perception of supervisor support, the lower the employee's intention to leave work individually.

Tabel 1: *Mean, Standar Deviasi dan Korelasi*

| No | Variable | *Mean* | *SD* | *Scale* | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|
| 1 | *Perceived Supervisor Support* | 5.15 | 0.88 | 1-7 | 1 | | |
| 2 | *Psychological Empowerment* | 5.22 | 0.70 | 1-7 | .63** | 1 | |
| 3 | *Turnover Intention* | 2.43 | 0.61 | 1-4 | .34** | .40** | 1 |

*Note. n* =150. ***p<0.01*

Next, the researcher tested the second hypothesis (H2) with PROCESS Hayes model 4 via the Bootstrap method. Testing indirect relationships (indirect effects) through mediators Psychological empowerment shows significant results. Psychological empowerment mediates perception supervisor support and intention to leave work with R2=0.414, p<0.01.

Tabel 2: *Influence of Independent Variables on Dependent Variables*

| *Independent Variable* | *Dependent Variable Turnover Intention* | | | |
|---|---|---|---|---|
| | *Direct Effect* | *Indirect Effect* | *Total Effect* | *Mediation* |
| *Perceived Supervisor Support* | -0.086 (*ns*) | - | - | |
| *Psychological Empowerment* | | -0.104** | -0.190** | *Full mediation* |

*** p<0.01*

According to table 2, Based on the test results, it is known that the psychological empowerment variable is proven to mediate the relationship between perceived supervisor support and employee intention to leave work. The results of this method Bootstrapping was carried out to test the mediator model (indirect effect) showing empowerment psychology became a complete mediator between the relationship between superior support and turnover intention work (95% CI, lower level: -0.189, upper level: -0.039).

Thus, it can be concluded that in this study there is a perception of superior support role in intention to leave work with psychological empowerment as a mediator variable. In this mediation model, psychological empowerment is a full mediator of perceptions of superior support with the intention of leaving work.

## Conclusion

In this research, it is proven that there is a role of perceived supervsior support on the intention to leave work. This is not in line with previous research conducted by Afzal et al. (2019). To explain the results of this research, researchers used social exchange theory social when employees receive support from their superiors, employees will reciprocate it by carrying out behavior that is beneficial to their superiors (Afzal et al. 2019) in this case decreasing employee intentions to leave work can have an impact on turnover.

Furthermore, in this research it was also found that psychological empowerment can fully mediate the relationship between perceptions of supervisor support and individual's intention to leave work. There is a relationship between perceived supervisor support and intention to leave a job individual. From these results it can be explained that superiors or supervisors must support and increase individual motivation to work, so that individuals have the intention to leave work is declining. This is reinforced by the results of previous research conducted by Akgundus and Bardakoglu (2015) who explains that psychological empowerment is a variable that has a relationship with the intention to change jobs.

The results of this research also expand the results of previous research conducted by Afzal et al. (2019) who found that perceptions of superior support can play a role in intentions to leave work through the mediation of self-efficacy.

There are several limitations to this research. In this study, researchers used the unidimensional construct of perceived supervisor support. Meanwhile, perceptions of support superiors can be multidimensional. Therefore, it is hoped that further research can develop a multidimensional construct of perceived supervisor support.

## Acknowledgements

The credit or acknowledgement is addressed to the other parties that helped the execution of the research, whose contribution is not significant enough to be mentioned in authorship.

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# *The Effect of Semantic Ambiguity on Concreteness Ratings*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
This research was conducted to investigate how semantic ambiguity of words may influence concreteness ratings when words are presented to raters in isolation. To this end, a correlational analysis was conducted between semantic ambiguity based on Hoffman et al.'s (2013) *semantic diversity* measure (SemD) and the standard deviation values (SDs) of the concreteness ratings based on Brysbaert et al.'s (2013) database, for a subset of 2031 English words. It was predicted that as the ambiguity of words increases, the size of SDs of concreteness ratings for those words would also increase. In line with this prediction, a significant positive correlation was found between SemD and the SDs of concreteness ratings. This correlation suggests that ambiguous words tend to elicit more diverse ratings compared to less ambiguous words due possibly to the existence of various referents with different concreteness levels for the same word, influencing the raters' judgments of concreteness.

Keywords: Concreteness, Ambiguity, Semantic Diversity

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## Introduction

Concreteness refers to the perceptibility of the things/objects that words refer to. To determine whether a word is concrete or abstract, a common approach is to ask native speakers to rate words in isolation by giving a value indicating the level of concreteness (e.g., 1=very abstract, 5=very concrete). Although some words can be unanimously rated as highly concrete (e.g., *bird*) or highly abstract (e.g., *belief* )[1], a great number of words can be rated differently depending on various factors typically overlooked – an issue that has received attention in a relatively small number of studies (e.g., Löhr, 2022; Pollock, 2018; Reijnierse, Burgers, Bolognesi, & Krennmayr, 2019).

One factor of interest in this paper is semantic ambiguity. It is a characteristic of words that are ambiguous when encountered out of context. For example, the word '*course'* can have multiple meanings which may vary in the degree of concreteness such as a subject in a school, a part of meal, or the direction where something moves among many other senses and meanings. This type of ambiguity, which abounds in a substantial proportion of words in English, is usually referred to by two terms depending on the degree of relatedness between meanings. These terms are *polysemy,* a feature of words with many senses that usually share a core meaning, and *homonymy,* a feature of words that convey unrelated meanings (See Hurford, Heasley, & Smith, 2007 for more discussion and examples).

Despite the importance of this issue, the existing research on the potential effect of semantic ambiguity on concreteness ratings is sparse. In a recent paper, Löhr (2022) pointed out lexical ambiguity as a problem affecting the current concreteness ratings as lexical forms of words are rated rather than the concepts they refer to. Reijnierse et al. (2019) provided experimental evidence for the effect of polysemy in which they found that presenting polysemous words (e.g., burden) along with their definitions elicited different ratings depending on whether the definition was metaphorical or non-metaphorical.

## The Current Study

This study aims to measure the relationship between semantic ambiguity and concreteness ratings. Of relevance to the current study is Brysbaert et al.'s (2013) database due to its size, as it provides norms for about 40,000 English words and phrases. In particular, the SDs of the concreteness norms in this database are the primary source of the dependent variable values in the present research as they indicate the degree of agreement among the raters. In one prominent critique of Brysbaert et al.'s database, Pollock (2018) argues that many words that are usually selected to serve as the '*abstract'* items in previous experiments are not necessarily abstract, but words about which raters tend to disagree as indicated by the increased SD of almost every word in the middle of the scale – an observation that the researcher visually demonstrated by representing the data graphically. Pollock's study was important as it drew attention to the fact that a large number of words in the current concreteness databases have diverse ratings. However, it remains unclear what factors have contributed to this variability. To contribute to the existing research in this area, the present study aims to examine the extent to which semantic ambiguity influences concreteness norms. The main prediction in this paper was that the ambiguity of words would correlate positively with the size of the SDs of the ratings of these words.

[1] According to Brysbaert, Warriner, and Kuperman (2013), '*bird'* received an average of 5 and '*belief'* received an average of 1.19. These words have low standard deviations (SD=0.00; SD=0.68 respectively), indicating a high level of agreement among raters.

## Methods

To test the issue outlined above, a subset of 2031 highly frequent English words, along with the SDs of the concreteness ratings, was selected from Brysbaert et al.'s (2013) database. Next, these words were entered into the *South Carolina Psycholinguistic Metabase* (Gao, Shinkareva, & Desai, 2022) to extract semantic information for their semantic ambiguity. To obtain data about the ambiguity of these words, the *semantic diversity* (SemD) measure of Hoffman et al. (2013) was used (All words and data can be accessed online at https://osf.io/2ubjf/). SemD was developed as a corpus-based approach to determining the degree of ambiguity of words through calculating the number of contexts in which words appear; more ambiguous words tend to appear in more diverse contexts than less ambiguous words (See Table 1 for 6 examples from this database). Unlike previous studies which determined ambiguity based on criteria such as the number of meanings, how meanings are listed in a dictionary, or the relatedness between meanings as judged by native speakers (e.g., Rodd, Gaskell, & Marslen-Wilson, 2002), SemD is an objective measure that uses the diversity of the contexts in which words appear in as an index of ambiguity. For example, words such as *ability*, *absence*, and *year* are highly frequent words and appear in more diverse contexts than words such as *tectonics*, *phoneme*, and *goblins*, which seem to be more restricted to certain domains (i.e., geology, linguistics, and fairy tales).

**Table 1.** Examples of words with different semantic diversity levels

| | Words | SemD |
|---|---|---|
| *High* | *ability* | 2.06 |
| | *absence* | 2.16 |
| | *year* | 2.24 |
| *Low* | *tectonics* | 0.49 |
| | *phoneme* | 0.45 |
| | *goblins* | 0.39 |

## Results

There were two variables in this research: SemD, which reflects the semantic ambiguity of the selected words, and the SDs of the concreteness ratings based on a group of native speakers of English, which reflect the degree of agreement among the participants who rated the words in Brysbaert's Database. To test the main prediction in this study, a Pearson correlation analysis was performed to see whether a significant correlation can be detected between the two variables. In line with this hypothesis, a significant positive correlation was obtained, $r=.32$, $n=2031$, $p<.001$, with more ambiguous words, according to Hoffman's measure, eliciting more variable ratings (See Figure 1). The data were analysed and plotted using RStudio (Version 4.0.5).

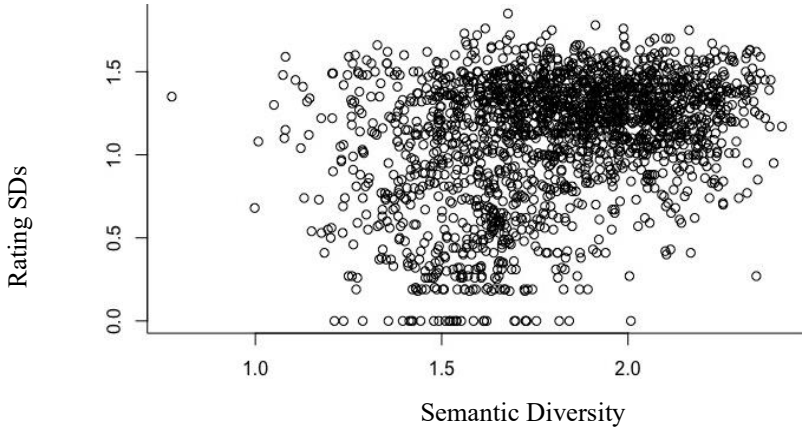



**Figure 1.** The correlation between concreteness SDs and semantic ambiguity for 2031 English words.

## Discussion and Conclusion

This small study was an attempt to gain a more understanding of some of the factors that may influence the agreement among human subjects when judging whether a word is concrete or abstract. The focus was on the potential effect of the semantic ambiguity of words – a variable that has not been adequately taken into account when building a concreteness normative database. The study utilized secondary data from mega-studies available online to gain more insights into how availability of words in diverse contexts can inform us of the (dis)agreement among raters, which is reflected by the SDs of these ratings obtained for these words. The results showed that as ambiguity increases, the size of the SDs increases as well.

This positive correlation indicates that ambiguous words tend to elicit more diverse ratings compared to less ambiguous words due possibly to the existence of various meanings with different concreteness levels for the same word, influencing the raters' judgments of concreteness. The research adds more evidence to the existing studies that reported effects for semantic variables on the way raters judge the concreteness of words (e.g., Reijnierse et al., 2019). Such observation is also similar to translation ambiguity reported in some normative studies where a large class of words in the source language tend to elicit multiple translations in the target language (e.g., Prior, MacWhinney, & Kroll, 2007; Tokowicz, Kroll, De Groot, & Van Hell, 2002). In those studies, it was found that the number of translations produced by raters is determined by the degree of ambiguity of the lexical form of the word in the source language.

This observation also opens the door for more research in this field using more complex designs to understand potentially confounding variables that may undermine the reliability of the current databases, thereby enhancing the validity of these databases. One possible explanation for why increased ambiguity leads to more diverse ratings is that when a word is presented in isolation for rating, the diverse usage of this word affects the judgements of participants differently depending on their recent experiences with the word or the first meaning that comes to mind. It is recommended here that a qualitative analysis is incorporated into these studies in which some raters are interviewed to find out some of the reasons behind their ratings.

In conclusion, this research aimed to examine whether the ambiguous nature of words, a phenomenon that abounds in a large number of words in English, can contribute to the presence

of diverse ratings in the current concreteness norms of the Brysbaert concreteness database where these norms were obtained for the words out of context. This approach is currently the most commonly used method for building concreteness normative databases. Using a subset of 2031 English words, a correlational analysis revealed that when ambiguity increased, the degree of disagreement among raters increased, implying that the polysemous nature of words is a possible factor influencing how human subjects judge whether a word is concrete or abstract.

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# *Applying Biophilic to the Interior Design of Healthcare Facilities With a Healing Approach*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
This research attempts to elaborate the biophilic concept on the interior design of health service facilities. The research method involves a literature review exploring the biophilic parameter theory from Terrapin Bright Green, utilizing data sources from relevant books, scientific journals, and internet images. The findings reveal that biophilic, an evolving approach to construct environmental designs for diverse purposes, emerged in 1984 when humans recognized their inherent connection with nature. Key elements in biophilic design encompass natural lighting, open spaces, sensory engagement, organic forms, natural processes, and the repetition of natural patterns. The impactful outcome is evident in health facilities, significantly enhancing the physical and psychological well-being of patients. The interior design is also pivotal on the treatment and recovery success, such as for cancer patients. Consequently, this research suggests a design concept of mood-board highlighting aspects like the selection of elements, materials, colors, lighting, textiles, furniture, and patient-friendly accessories. Its implementation is seen in the design of communal areas, treatment rooms, patient service areas, and staff areas. To conclude, the integration of psychological and architectural principles in biophilic design facilitates a reconnection with nature for all health service users-patients, doctors, nurses, visitors, and staffs. This reconnection can create a tranquil, organized, relaxed, and prosperous milieu, preventing depressive atmospheres. Furthermore, high-quality architecture extends a positive effect on stress alleviation, and immune system strength, ultimately mitigating and controlling the development of disease.

Keywords: Biophilic, Environmental Psychology, Healing Approach

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## Introduction

Biophilic design embraces a holistic approach, acknowledging the significance of living organisms and the interconnectedness of the mind and body in assessing overall well-being within a given setting. Successful implementation of biophilic design entails considering a range of factors including health considerations, societal norms, past experiences, the frequency and duration of user interactions, potential levels of engagement, as well as user perceptions and experiences. By incorporating these elements, biophilic design endeavors to create environments that not only inspire aesthetically but also promote restoration, health, and seamless integration with the functions of the surrounding location and the broader urban ecosystem it serves [1].

The theory of biophilia suggests that humans have an innate biological inclination to engage with nature on social, physical, and psychological levels. This innate connection between humans and the natural environment significantly influences productivity, personal welfare, and social interactions. Biophilia can manifest diversely, enhancing an otherwise mundane environment into a more enriching one. Such transformation may arise from interactions with nature, involvement with animals, leisurely strolls in a park, or simply observing green spaces from home or work [2].

From a psychological standpoint, biophilia is intertwined with the healing process, which seeks to reinstate harmony within an individual. This concept entails a symbiotic relationship encompassing individuals, families, communities, the environment, and the essence of life. Healing transcends mere actions; it involves the restoration of equilibrium among these interconnected elements [3]. A state of health reflects this balance within the body, whereas illness signifies its disruption [4]. Studies indicate that hospitalized patients experience specific anxiety patterns, highlighting the importance of crafting environments that alleviate stress during recovery. Hence, a healing environment emerges from design interventions that positively impact the physical and psychological well-being of patients, healthcare professionals, and visitors.




**Figure 1.** Architectural Quality relates to Psychology

As illustrated in Figure 1, evidence-based design, grounded in scientific validation [5], demonstrates that architectural elements can effectively mitigate stress. The manner in which patients perceive their surroundings through their five senses—touch, sight, hearing, smell, and taste—profoundly influences their well-being while coping with illness. Improvements in their psychological recovery can contribute to bolstering the immune system. In the realm of enhancing architectural standards, addressing non-medical needs involves creating a pleasant environment capable of diverting patients' attention from their ailments. This transformation fosters a welcoming atmosphere for all users, including patients, families, healthcare professionals, and non-medical staff [6].

The chosen case study concentrates on the interior design of cancer care facilities due to the distinctive needs of cancer patients, who often experience higher levels of anxiety and depression compared to those with other illnesses. The success of their healing journey

hinges not only on their physical condition but also on their psychological well-being. Biophilic design is employed as a strategy to prototype cancer care, aiming to restore equilibrium between the physical and psychological realms. The physical environment surrounding cancer patients profoundly affects their lives, emphasizing the critical role of interior design in ensuring successful treatment, recovery, and overall outcomes [7]. To define specific biophilic standards for cancer care, a qualitative methodology is adopted, drawing from the "14 Patterns of Biophilic Design" by Terrapin Bright Green, while evidence-based design principles as outlined by Sosa (2020) elucidate the healing process. A thorough literature review explores these biophilic parameters, offering valuable insights, particularly for emerging designers seeking to integrate a healing-focused approach into their interior design practices.

## Theory

### *Biophilic Design*

Biophilic design parameters aim to alleviate stress, enhance cognitive function and creativity, promote overall well-being, and facilitate faster healing processes. In an increasingly urbanized world, these attributes become increasingly crucial. Considering the swift restorative response that nature can evoke and the substantial financial losses incurred by U.S. businesses annually due to stress-related illnesses, a design approach that reintegrates humans with nature—biophilic design—becomes imperative. It offers individuals the chance to reside and work in environments that promote health and well-being, reduce stress, and foster greater overall vitality [5].

In terms of reconnecting with nature, biophilic design encompasses several elements. These include both visual and non-visual connections with nature, exposure to non-rhythmic sensory stimuli, variation in thermal conditions and airflow, the presence of water features, dynamic and diffuse lighting, integration with natural systems, incorporation of biomorphic forms and patterns, using materials that evoke nature, and embracing complexity and order [1]. According to Sosa (2020), biophilic design manifests in architectural and physical features such as views of nature, therapeutic gardens, indoor plants, choice of materials and colors, and the integration of art within the space.

To translate the healing process, the pattern of biophilic design focuses on details such below [1]:

1. Visual Connection with Nature: Providing views of natural elements, living systems, and processes occurring in nature.
2. Non-Visual Connection with Nature: Incorporating auditory, tactile, olfactory, or gustatory stimuli that evoke positive associations with nature, living systems, or natural processes.
3. Non-Rhythmic Sensory Stimuli: Introducing stochastic and transient interactions with nature that can be statistically analyzed but not precisely predicted.
4. Thermal & Airflow Variability: Implementing subtle fluctuations in air temperature, humidity, airflow on the skin, and surface temperatures to simulate natural environments.
5. Presence of Water: Enhancing the environment through the sight, sound, or touch of water.
6. Dynamic & Diffuse Light: Utilizing varying light intensities and shadows that change over time, mimicking natural lighting conditions.

7. Connection with Natural Systems: Fostering an understanding of natural processes, particularly seasonal and temporal changes typical of healthy ecosystems.
8. Biomorphic Forms & Patterns: Incorporating symbolic representations of contoured, patterned, textured, or numerical arrangements found in nature.
9. Material Connection with Nature: Utilizing materials and elements sourced from nature with minimal processing to reflect local ecology or geology, thereby establishing a unique sense of place.
10. Complexity & Order: Providing rich sensory information that follows a spatial hierarchy akin to natural environments.

### *Cancer Patient' Character – Healing Approach to Interior Design*

Interior design encompasses features that engage the senses of touch (somatosensory), sight (visual), hearing (auditory), smell (olfactory), and taste (gustatory). This holistic approach is crucial, especially for cancer patients who may experience varying levels of pain. Designing not just for palliative care but for a healing environment is essential. Holistic design solutions must address physical symptoms of illness, psychological well-being (including emotions such as worry, fear, sadness, and anger), social needs (such as family support, dietary requirements, work, housing, and interpersonal relationships), and spiritual concerns (including questions about life and death, and the search for peace) [8]. Interior features such as flooring, ceilings, walls/openings, materials, colors, lighting, textiles, furniture, accessories, art, and signage are all vital components in creating an environment that caters to these diverse needs [9].

## Methodology

This study employs a qualitative approach to explore the concept that healing architecture can be quantified and applied in interior design. To identify relevant parameters, the author conducts a literature review drawing from the Terrapin Bright Green theory, which provides insights into interior qualities conducive to healing. Subsequently, these parameters are tested in a case study focused on cancer care facilities, which possess unique characteristics that emphasize both the psychological and physical dimensions of their design. The outcome of this research is a biophilic interior design presented in the form of a mood board, serving as a design prototype that can inform similar projects in the future.

## Implementation of Biophilic Parameter in Interior Design

Generally, cancer care facilities comprise four primary areas: a common area, treatment spaces, patient services, and a staff area (see Figure 2):

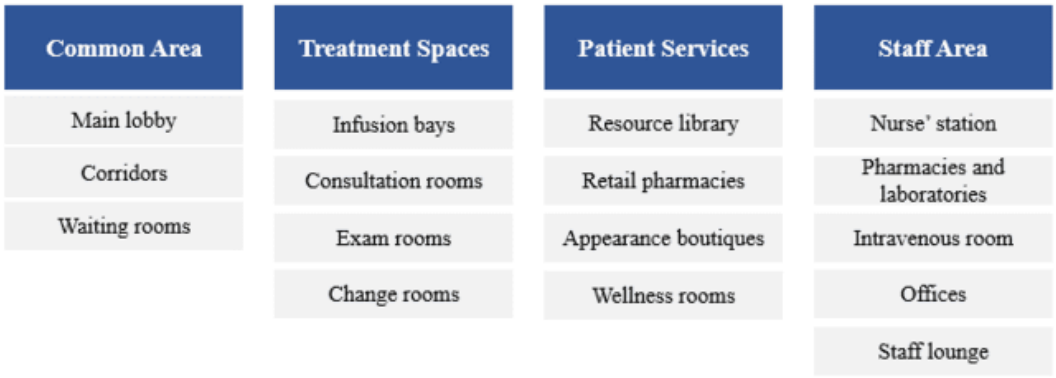



**Figure 2.** Cancer Care Facilities

The initial step involves pinpointing the biophilic parameters within the healing process, particularly in the architectural aspects accessible to patients within healthcare facilities. Despite the importance of sound architectural design, the emphasis on biophilic parameters suggests a need for a comprehensive development of this concept. While technical features are valuable for healthcare practitioners, it's equally essential to focus on the thoughtful development of interior design elements such as materials, colors, lighting, textiles, furniture, accessories, art, and signage [9]. Integrating biophilic principles into these elements can significantly enhance the healing environment for patients.

**Table 1.** Mapping of Interior Qualities and Biophilic Parameters

| **Interior Qualities** (John Pile, 2007) | **Biophilic Parameters** (Terrapin, 2014) | **Mapping Results** (Interior-Biophilic Parameters) |
|---|---|---|
| **Elements: Floor, ceiling, wall/opening** | Visual Connection with Nature | A view of elements of nature, living systems, and natural processes. |
| | | Awareness of natural processes, especially seasonal and temporal changes characteristic of a healthy ecosystem. |
| **Material** | Non-Visual Connection with Nature | Stochastic and ephemeral connections with nature may be analyzed statistically but may not be predicted precisely. |
| | | Symbolic references to contoured, patterned, textured, or numerical arrangements that persist in nature. |
| **Color** | Non-Rhythmic Sensory Stimuli | A condition that enhances the experience of a place through seeing, hearing, or touching the water. |
| | | Subtle changes in air temperature, relative humidity, airflow across the skin, and surface temperatures that mimic natural environments. |
| **Lighting** | Thermal & Airflow Variability | Leverages varying intensities of light and shadow that change over time to create conditions that occur in nature. |
| **Textiles** | Presence of Water | Auditory, haptic, olfactory, or gustatory stimuli that engender a deliberate and positive reference to nature, living systems, or natural processes. |

| | | |
|---|---|---|
| **Furniture** | Dynamic & Diffuse Light | Materials and elements from nature that, through minimal processing, reflect the local ecology or geology and create a distinct sense of place. |
| **Accessories, Art, Signage** | Connection with Natural Systems<br>Biomorphic Forms & Patterns<br>Material Connection with Nature<br>Complexity & Order | Rich sensory information adheres to a spatial hierarchy similar to those encountered in nature. |

From the mapping of interior qualities and biophilic parameters, we have identified specific details regarding the interior appearance that should be implemented. These include:

**Table 2.** Implementation of Biophilic to Interior Design

| Rooms | Elements | Material | Color | Lighting | Textiles | Furniture | Accessories |
|---|---|---|---|---|---|---|---|
| **Main Lobby** | Noise barrier by nature | Durable and safe flooring: Vinyl | Representation of color' water, vegetation color | Representation of daylight, enhance the warm light | More textiles as a noise control | Clustering furniture layouting | Apply the artwork related to the nature |
| **Corridors** | Hard flooring, pattern by nature | Wall and ceiling finishes | Darker-hued floor | Representation of daylight, enhance the warm light | Wallpaper | - | Sorting artwork |
| **Waiting Rooms** | Soft flooring | Vinyl floor | Darker-hued floor | Representation of daylight, enhance the warm light | View to nature | Soft seating, carpeted flooring | Nature as an art |
| **Infusion Bays** | Wall and ceiling should maximize patients' exposure to outside view | Vinyl floor | Different colors to define each room | Maximize patients' exposure to natural light | Soft textiles, view to nature | Built-in furniture | Nature as an art |
| **Consultation Room** | Carpeted flooring | Contoured, patterned, textured or numerical arrangements that persist in nature. | Representation of plants | Soft lighting | More textiles in furniture | Soft seating, carpeted flooring | Contoured, patterned, textured or numerical arrangements that persist in nature. |
| **Exam Room** | Soundproofing wall | Artificial nature ambiance | Warm color, wood-grain look | Soft lighting | Curtain to divide each room | Soft bed, chair | Wall-mounted artwork |
| **Change Room** | Soft wall covering | Artificial nature ambiance | Warm color | Soft lighting | Carpet | Soft chair | Wall-mounted artwork |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Resource Library** | Wall and ceiling should maximize patients' exposure to outside view | Vinyl floor | Representation of water color, vegetation color | Soft lighting | Soft textiles view to nature | Clustered-seating | Apply the artwork related to the nature |
| **Retail Pharmacies** | Soft wall covering | Artificial nature ambiance | Warm color | Warm light | View to nature | Clustered-seating | Nature as an art |
| **Wellness Rooms** | Carpet/wood flooring | Contoured, patterned, textured or numerical arrangements that persist in nature. | Representation of water color, vegetation color | Warm light | Carpet | Folding tables | Apply the artwork related to the nature |

Based on the details provided, the author has proposed several mood boards for interior design, focusing on rooms primarily accessed by patients, including the Common Area (Main Lobby, Corridors, and Waiting Rooms); Treatment Spaces (Infusion Bays, Consultation Rooms, Exam Rooms, and Change Room); and Patient Services (Resources Library, Retail Pharmacies, and Wellness Rooms).

**Figure 3** displays the mood board for the Main Lobby, Corridors, and Waiting Room. Aligned with the room requirements and informed by biophilic parameters, the mood board incorporates the following elements: noise control material, safe flooring, artwork, clustered furniture, soft seating, and darker-hued color (blue, green, yellow-brown) [10]. These elements are carefully curated to create a welcoming and soothing atmosphere, conducive to the well-being and healing of patients accessing these spaces.




**Figure 3.** Mood Board: Main Lobby, Corridor, Waiting Room




**Figure 4.** Mood Board: Infusion Bays, Consultation Room, Exam Room

In contrast to the previous mood boards, the design for the Infusion Bays, Consulting Room, and Exam Room (Figure 4) opts for softer colors with a greater emphasis on textiles. Textiles play a prominent role, appearing on the carpet, cushions, curtains, and sofa upholstery. These rooms, being more personal for patient care, require an interior design that is highly responsive to their somatosensory, visual, auditory, olfactory, and gustatory needs.

The design incorporates private, semi-private, and open bays arranged around windows to maximize patients' exposure to natural light and outdoor views. Each space may feature a different pattern and color floor, with privacy curtains serving as a convenient solution for existing spaces. Warm colors and a wood-grain aesthetic contribute to a cozy ambiance, complemented by clutter-free counters and wall-mounted artwork. This design approach aims to create a comfortable and soothing environment, enhancing the overall experience for patients receiving treatment in these spaces.

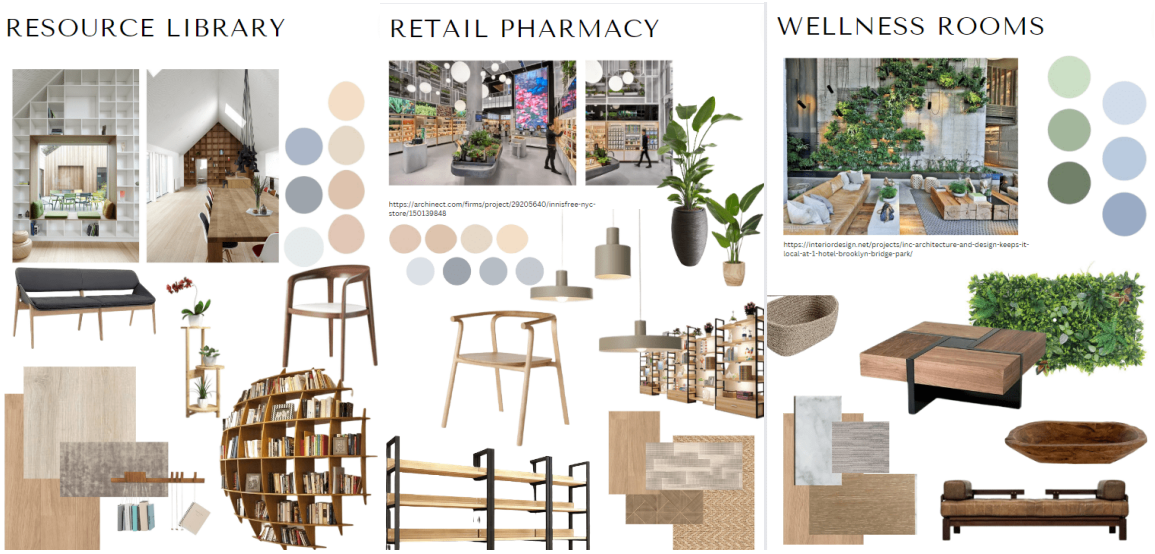



**Figure 5.** Mood Board: Resource Library, Retail Pharmacy, Wellness Room

The final set of mood boards depicts the Resource Library, Retail Pharmacy, and Wellness Room (Figure 5), comprising the Patient Service area, which supports the patient's primary activities. While the colors used remain consistent with the overall space, the focus in this

area shifts to detailed accessories. Patient comfort remains a priority, achieved through wide openings to the outside to prevent patients from feeling fatigued while in the room. This design approach ensures that patients can access necessary resources and services in a comfortable and inviting environment, contributing to their overall well-being and satisfaction during their healthcare experience. Biophilic design is evident in the use of plants dominating the walls of the room, providing patients with a positive view and access to nature within the interior. Colors inspired by nature are utilized to uplift spirits during treatment, particularly in stressful conditions.

The Resource Library features various seating options, including clusters of club chairs, a small conference table, and individual workstations, catering to different user needs. In contrast, the Retail Pharmacies offer private counseling areas for patient education on safe medication use. The Wellness Room is designed to be a patient's favorite gathering place, facilitating discussions with family, relatives, and medical personnel while providing palliative facilities and educational sessions. Its attractive design incorporates floor, wall, and ceiling elements representing nature, including a woody floor layered with carpet and stackable chairs for versatile layouts. The green wall serves as a focal point, further enhancing the room's appeal and connection to nature.

## Conclusion

Biophilic design offers a plethora of benefits by aiming to reestablish the connection between humans and nature, leading to positive behavioral, mental, and physical outcomes. This design approach is exemplified by incorporating elements such as natural lighting, ventilation, water features, and plants into spaces. These natural elements can be integrated using genuine materials and imitations of natural forms through design, patterns, and interior finishes. The fundamental concept of biophilic design is to create environments that nurture a connection with nature, fulfilling a basic human need. This is particularly crucial for cancer patients, as it contributes to their sense of calm, order, and well-being, which are vital for their recovery.

In interior spaces, enhancing visual design can be beneficial, making the environment appealing to both patients and their visitors while avoiding a sense of depression. Interior qualities, including materials, colors, lighting, textiles, furniture, accessories, art, and signage, can be strategically employed to address both architectural and non-architectural factors. Consequently, biophilic design in interior spaces is best achieved by tailoring the experience to each typical user, whether they be a patient, doctor, nurse, visitor, or another staff member. This personalized approach ensures that the space effectively supports the needs and well-being of all occupants.

## Acknowledgements

Thank you to Pembangunan Jaya University and the Kediri State Islamic Institute for financial assistance for the conference. Also to Dewi Nur Suci, English lecturer at IAIN Kediri who has helped translate this article.

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# *A Valid and Reliable Instruments to Measure Learning Motivation of University Students in Elementary Teacher Education*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
Learning motivation encourages university students to study and carry out certain activities that foster passion and enthusiasm to achieve maximum learning goals and results. To measure learning motivation, valid and reliable measurement tools were needed. The aim of this study was to assess the construct validity and construct reliability of a newly designed university student learning motivation instrument. Using quantitative methods, 282 respondents from 5 randomly selected universities were involved in this research. Using the Lisrel 8.80 program, the data obtained were analyzed using second order confirmatory factor analysis. This variable is measured by four indicators and 20 measuring items and 4 scales, namely: Intrinsic Motivation, Amotivation, Extrinsic-Career Motivation, and Extrinsic-social motivation. The research results show that the university student learning motivation instrument is valid in terms of factor loading, convergent validity and discriminant validity, and meets the construct reliability requirements, so that the university student learning motivation instrument developed is feasible for use.

Keywords: Learning Motivation, Confirmatory Factor Analysis, Elementary Education

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## Introduction

We often hear the word "motive" in everyday life. It is often common for people to define "motive" as why "someone does something." According to (Bakar, 2014), motivation is a complex part of psychology and human behavior that influences individuals to invest their time and energy in doing a job, how they think and feel about the task, and how long they persist. Suryabrata (2006) explains that motivation is a state within a person's personality that encourages people to carry out certain activities to achieve goals. Motivation is the driving force behind an action and is why someone does something (Nadya & Pustika, 2021). Based on experts, it can be concluded that motivation is a conscious effort to influence someone's behavior so that they are moved to do something to achieve specific results and goals.

Energy changes within a person take the form of real activity in the form of physical activity; because a person has a certain goal for his activity, he has a strong motivation to achieve it with all the effort he can make (Harahap et al., 2021). Human life is influenced by motivation and is closely related to the hope and willingness to learn from within a person to achieve learning goals. Motivation is an important psychological factor in the learning process. Motivation is generated through stimulus situations together with memories to influence students in such a way according to mechanical laws so that it directs, activates and increases student activity in the learning process (Tasiwan et al., 2014).

Learning motivation can be interpreted as the driving force to carry out certain learning activities that come from within oneself and outside the individual to foster enthusiasm for learning (Monika & Adman, 2017). Furthermore, Andriani & Rasto (2019) stated that learning motivation is an absolute requirement for learning and is important in providing passion or enthusiasm for learning. In agreement with this, Sardiman (2007) explains that learning motivation is a psychological factor that is non-intellectual and its specific role is in terms of growing passion, feeling happy and enthusiastic about learning. Motivation to learn appears within a person to carry out learning activities for the best results.

Motivation plays a very important role in the learning process, because motivation can foster enthusiasm within oneself, increase curiosity and be active in learning, so that with motivation students can be encouraged to study more seriously. In learning activities, motivation can be said to be the overall driving force within students, which creates, ensures continuity, and provides direction to learning activities so that learning goals are expected to be achieved (Sardiman, 2007). Motivation plays a vital role in the learning process, because motivation can foster enthusiasm within oneself, increase curiosity and be active in learning, so that with motivation, students can be encouraged to study more seriously (Krismony et al., 2020). Based on several definitions of learning motivation, ,it can be interpreted that learning motivation is a condition within an individual that encourages students to learn and carry out certain activities that foster passion and enthusiasm to achieve maximum learning goals and results.

So far, there have been challenges in measuring variables, especially in assessing the motivation of students majoring in elementary education. Lecturers seek to identify appropriate measuring tools and scales to collect relevant information about student motivation. This problem is significant because lecturers have an essential role in implementing education in higher education, including educational evaluation (Tjabolo & Herwin, 2020). It is essential for lecturers to prepare assessments to measure students' learning motivation. According to Clements & Cord (2013), assessment is an important

component in the learning process. One is that valid and reliable measuring instruments and scales are needed to assess learning motivation.

This research aims to develop an instrument for measuring student learning motivation that meets two psychometric criteria: validity and reliability. The learning motivation instrument developed must be tested for construct validity and reliability. Construct validity refers to the quality of the measuring instrument used to determine whether or not the theoretical construct is used as a basis for operationalization. In short, construct validity assesses how well a researcher can translate the theory into a measuring instrument. Construct validation begins by identifying and limiting the variables to be measured and expressed as a logical construct based on the theory regarding these variables (Retnawati, 2016).

The novelty of this research lies in developing a test instrument that can calculate a whole number of valid and reliable operations. The instrument was tested for construct validity and reliability. Construct validity is used to assess how well the theory used translates into the instruments used. Proving construct validity can be done with factor analysis. Confirmatory Factor Analysis (CFA) is an approach in factor analysis used to test how well the measured variables can represent previously prepared factors or constructs. This test helps measure the model (measurement model) to describe aspects and indicators as a reflection of the latent variable, namely the ability to calculate integer operations by looking at the loading factors of each aspect that forms a construct. CFA is also useful for testing the construct validity and construct reliability of the items that form latent constructs (Elfida et al., 2021).

The CFA used in this research is second-order confirmatory factor analysis, a model whose measurement has two levels. The first level analysis was carried out from the latent construct of the aspects to each indicator, and the second level analysis was carried out from the latent construct to the aspect construct (Petsangsri & Pislae-Ngam, 2020; Sholahuddin et al., 2022). This research aims to test instruments for the ability to calculate a whole number of operations that meet construct validity and reliability. Construct validity includes convergent and discriminant validity. The instrument was tested using Confirmatory Factor Analysis assisted by Lisrel 8.80 software.

## Methods

This research uses a quantitative approach to describe a model for measuring student learning motivation using confirmatory factor analysis. This factor analysis method proves and verifies several factors underlying the research variables. The research sample was obtained from 282 university students majoring in primary school teacher education who were randomly selected from 5 specified universities. The adequacy sample influences the internal model suitability analysis factor (Yadama & Pandey, 1995). Therefore it is necessary to consider the use of an adequacy sample. Using several participants more than 100 or five times from several items analyzed can be done to obtain valid data on factors analysis (MacCallum et al., 1999; O'Rourke & Hatcher, 2013).

Data was collected by observation using university student learning motivation instruments and by conducting performance tests with participants. Data was obtained from university students who were observed. The observation sheet used is by the research variable construct, which contains 20 measurement items from four indicator categories. A measurement scale is applied to categorize observation results. The questionnaire scale is 5, 4, 3, 2, and 1. The research data is then summarized and tabulated for further analysis. The data analysis

technique used was confirmatory factor analysis. This study uses LISREL 8.80 software for data analysis. There are latent variables and indicator variables in the confirmatory factor analysis.

Variables studied in this research is learning motivation. Variable of learning motivation is focused on university students in elementary teacher education base. In research, This variable will be measured with four indicators and 20 measurement items. The fourth indicator includes; Intrinsic Motivation, Amotivation, Extrinsic-Career Motivation, and Extrinsic- social motivation. Every indicator is measured with five items. Table 1 below explains the distribution from indicator and item measurements.

**Table 1.** Measurement Indicators and Items of Learning Motivation

| Indicators | Measurement Items | Code |
|---|---|---|
| Intrinsic Motivation (A) | Students enjoy studying every subject | A1 |
| | Students enjoy discussing subject content | A2 |
| | Students like to share new things they have learned | A3 |
| | Students enjoy reading study sources and literature | A4 |
| | Students have an interest in learning in class | A5 |
| Amotivation (B) | Students have strong reasons to study | B6 |
| | Students know the benefits of lessons in the future | B7 |
| | Students know the reasons why they have to study | B8 |
| | Students know the benefits of new things learned | B9 |
| | Students take part in a series of learning activities | B10 |
| Extrinsic-Career Motivation (C) | Students know the connection between learning and profession | C11 |
| | Students know the importance of linking learning to the profession | C12 |
| | Students know their chosen concentration options | C13 |
| | Students know the opportunities of the chosen concentration | C14 |
| | Students know their future job options | C15 |
| Social-Extrinsic Motivation (D) | Students prove their success to themselves | D16 |
| | Students prove their success to their families | D17 |
| | Students prove their abilities to other friends | D18 |
| | Students prove their influence on the surrounding environment | D19 |
| | Students prove their positions in the community | D20 |

## Finding

This outline is based on the construct variable motivation to learn students, formulated previously. Construct This covers four indicators: Intrinsic motivation, Amotivation, Extrinsic-career Motivation, and Extrinsic-social Motivation. Analysis results: The fourth indicator is outlined based on the measurement item and the proof for every construct.

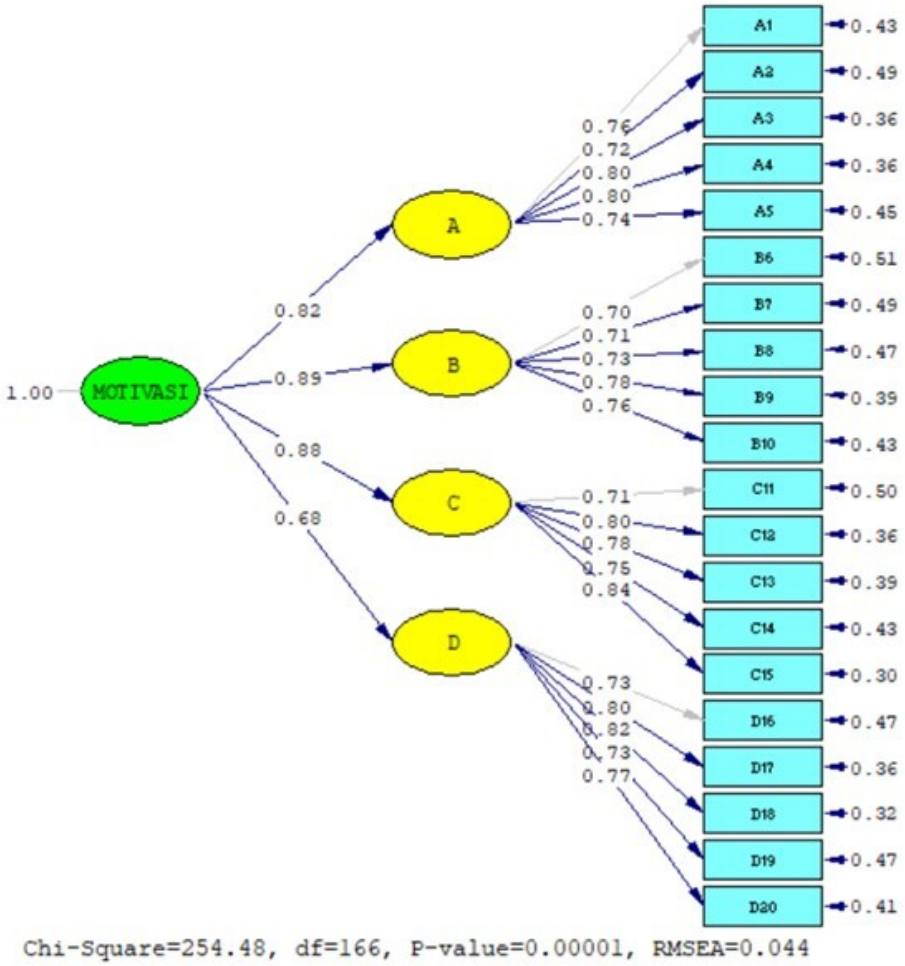



**Figure 1.** Factor loading's terms of the second-order confirmatory factor analysis.

**Tabel 2.** Convergent Validity

| Indicators | Items | λ | $\lambda^2$ | $1-\lambda^2$ | AVE |
|---|---|---|---|---|---|
| **A** | A1 | 0.76 | 0.5776 | 0.4224 | **0.58472** |
| | A2 | 0.72 | 0.5184 | 0.4816 | |
| | A3 | 0.8 | 0.64 | 0.36 | |
| | A4 | 0.8 | 0.64 | 0.36 | |
| | A5 | 0.74 | 0.5476 | 0.4524 | |
| ∑ | | **3.82** | **2.9236** | **2.0764** | |
| **B** | B6 | 0.7 | 0.49 | 0.51 | **0.5426** |
| | B7 | 0.71 | 0.5041 | 0.4959 | |
| | B8 | 0.73 | 0.5329 | 0.4671 | |
| | B9 | 0.78 | 0.6084 | 0.3916 | |
| | B10 | 0.76 | 0.5776 | 0.4224 | |
| ∑ | | **3.68** | **2,713** | **2,287** | |
| **C** | C11 | 0.71 | 0.5041 | 0.4959 | **0.60412** |
| | C12 | 0.8 | 0.64 | 0.36 | |
| | C13 | 0.78 | 0.6084 | 0.3916 | |
| | C14 | 0.75 | 0.5625 | 0.4375 | |
| | C15 | 0.84 | 0.7056 | 0.2944 | |
| ∑ | | **3.88** | **3.0206** | **1.9794** | |

| | | | | | |
|---|---|---|---|---|---|
| **D** | D16 | 0.73 | 0.5329 | 0.4671 | **0.59422** |
| | D17 | 0.8 | 0.64 | 0.36 | |
| | D18 | 0.82 | 0.6724 | 0.3276 | |
| | D19 | 0.73 | 0.5329 | 0.4671 | |
| | D20 | 0.77 | 0.5929 | 0.4071 | |
| ∑ | | **3.85** | **2.9711** | **2.0289** | |

**Table 3.** Discriminant Validity

| | **A** | **B** | **C** | **D** |
|---|---|---|---|---|
| **A** | 0.765 | 0.624 | 0.617 | 0.542 |
| **B** | 0.624 | 0.737 | 0.696 | 0.512 |
| **C** | 0.617 | 0.696 | 0.777 | 0.514 |
| **D** | 0.542 | 0.512 | 0.514 | 0.771 |

**Table 4.** Construct Reliability

| **Item** | **λ** | **$\lambda^2$** | **1-$\lambda^2$** | **ω** |
|---|---|---|---|---|
| A1 | 0.76 | 0.58 | 0.42 | **0,96** |
| A2 | 0.72 | 0.52 | 0.48 | |
| A3 | 0.80 | 0.64 | 0.36 | |
| A4 | 0.80 | 0.64 | 0.36 | |
| A5 | 0.74 | 0.55 | 0.45 | |
| B6 | 0.70 | 0.49 | 0.51 | |
| B7 | 0.71 | 0.50 | 0.50 | |
| B8 | 0.73 | 0.53 | 0.47 | |
| B9 | 0.78 | 0.61 | 0.39 | |
| B10 | 0.76 | 0.58 | 0.42 | |
| C11 | 0.71 | 0.50 | 0.50 | |
| C12 | 0.80 | 0.64 | 0.36 | |
| C13 | 0.78 | 0.61 | 0.39 | |
| C14 | 0.75 | 0.56 | 0.44 | |
| C15 | 0.84 | 0.71 | 0.29 | |
| D16 | 0.73 | 0.53 | 0.47 | |
| D17 | 0.80 | 0.64 | 0.36 | |
| D18 | 0.82 | 0.67 | 0.33 | |
| D19 | 0.73 | 0.53 | 0.47 | |
| D20 | 0.77 | 0.59 | 0.41 | |
| ∑ | **15.23** | | **8.37** | |

## Discussion

### *Factor Loading*

The second-order confirmatory factor analysis determines factor loading (λ) for each indicator and statement of university student learning motivation. In this test, four indicators consist of 20 measurement items. Based on the measurement point of view Figure 1, it can be seen that the factor loading (λ) for each measurement item is more than 0.4. Based on the measurement point of view, the findings of this study indicate that all factor loading on each indicator has a value greater than 0.4 (Prudon, 2015). But, Sujati (2021) claims that a factor

loading of λ0.50 or more is practically significant. So, an item is declared valid for its factors if it has a factor loading ≥0.50.

Based on the results of the second-order confirmatory factor analysis, as shown in Figure 1, it was found that all indicator and item measurements showed factor loadings > 0.5 also. The results of all items and factors are practically significant and suitable for data collection. After the factor loading analysis, all items were declared valid. It shows the Path Diagram, which displays the factor loading results from LISREL 8.80 processing. Each item of measurement is declared significant because the factor loading (λ) is more than 0.50.

### *Convergent Validity*

Convergent validity refers to the extent to which different variables measure similar constructs. In other words, convergent validity ensures that the variable is included in the latent construct to be measured (Wang et al., 2015). Convergent validity is based on the correlation between the responses of different variables in measuring the same construct. Next, the variables must be highly correlated with the latent construct. The size of the factor loading is a fundamental consideration in determining convergent validity (Hair et al., 2019). Sujati (2021) recommends average variance extract (AVE) as a measure of convergent validity because AVE can explain the extent to which items are shared between constructs in a structural equation model (SEM) where an AVE of 0.5 is more acceptable as convergent validity. Hair et al (2019) also recommend average variance extracted (AVE) as a measure of convergent validity because AVE can explain the extent to which items are shared between constructs in structural equation modeling (SEM), where an AVE of 0.5 or more is acceptable as convergent validity.

Scale development in this research involved four factors, namely; Intrinsic Motivation, Amotivation, Extrinsic-Career Motivation, and Extrinsic-social motivation. Based on research data, the results of convergent validity analysis can be described as follows. The research results show that the AVE values for the four factors are 0.58472, 0.5426, 0.60412, and 0.59422. Because all constructs exceed an AVE value of ≥0.50, it is concluded that these factors can measure latent variables. Therefore, these factors can be declared convergently valid.

### *Discriminant Validity*

The discriminant validity test is required to develop instruments involving latent variables. Discriminant validity, which refers to divergent validity means that two concepts must show significant differences conceptually (DeVellis & Thorpe, 2021). The discriminant validity test aims to prove that one construct is very different from others (Voorhees et al., 2016). Discriminant validity expresses how much a construct is differentiated from other constructs in a model (Hair et al., 2019).

Discriminant validity is demonstrated by correlations between latent constructs that are not too high or low factor covariance (Kenny & Kashy, 1992). Discriminant validity confirms that each latent construct is unique. In other words, one latent construct should not be highly correlated with other constructs (Henseler et al., 2015). This is fulfilled when two latent constructs are not correlated theoretically and empirically, as evidenced by scores indicating one construct is higher than the other.

Hair et al (2019) stated that discriminant validity can be built by correlating one construct with others. If the correlation value of the two constructs is smaller than 0.85, discriminant validity exists. Additionally, Fornell & Larcker (1981) argues that discriminant validity exists if a latent variable shows more variance in the related indicator variable than it shares with other constructs in the same model. The results presented in Table 3 inform that the four latent constructs each have a square root of AVE: 0.765, 0.737, 0.777, and 0.771. The square root of the AVE of the four latent constructs is greater than the correlation between the constructs. Conclusively, the four latent constructs have met the criteria for discriminant validity.

### *Construct Reliability*

The final aspect under scrutiny in this research is the reliability of the construct. Findings suggest that the assessment model for students' curiosity demonstrates reliability, boasting a coefficient of 0.96 in Table 4. According to Hinton et al (2014) a reliability index surpassing 0.90 indicates high reliability. This high coefficient suggests internal consistency and uniform variance among measurement items, implying that despite their differences, the items gauge the same construct (Widhiarso, 2009). The construct's reliability indicates the quality of an empirical measure and it can consistently reflect overall measurements even across multiple trials (Nájera Catalán & Gordon, 2020). Consequently, this study's assessment model for curiosity appears capable of consistently evaluating the curiosity construct.

Based construct reliability analysis, the omega ω result is 0.96. Referring to the criteria used, a construct reliability coefficient greater than 0.70 is considered acceptable (Naqsyahbandi & Prodjosantoso, 2023). Table 4 shows the results of construct reliability analysis based on factor loading coefficients. Based on table 4 indicators as a whole. Based on the analysis results, the omega coefficient was 0.96. Referring to the criteria used, namely the construct reliability coefficient value of more than 0.70, it is reasonable to conclude that the university student learning motivation in elementary teacher education instrument is reliable and fit for use.

## Conclusion

Based on the results and discussion, four indications were determined: Intrinsic Motivation, Amotivation, Extrinsic-Career Motivation, and Extrinsic-social motivation. Theoretically designed to develop an instrument for learning motivation, it has been proven to be valid in terms of factor loading, convergent validity, discriminant validity and construct reliability. The instrument developed was also declared suitable for data collection to measure learning motivation. We can measure university students' learning motivation in elementary teacher education using this instrument. Another implication in this study is that through this scale, teachers can also monitor the development of students learning motivation.

## Acknowledgements

The authors would like to thank Lembaga Pengelola Dana Pendidikan (LPDP) Indonesia, part of the Ministry of Finance of the Republic of Indonesia, for supporting our study and as a sponsor of this conference.

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# *Motivation to Volunteer in Indonesia: Scale Validation and Item Analysis*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
Volunteerism has advantages for the community. So, the measurement of volunteerism is important to research. Some study finds that motivation to volunteer are unidimensional construct. However, there are researchers that obtain evidence that it is multidimensional construct. This study aims to examine the motivation to volunteer construct in Indonesian sample, that never be done in the previous study. The instrument used is the Indonesian adaptation of Volunteer Functions Inventory by Clary et al (1998). Confirmatory Factor Analysis (CFA) used to examine the six dimensions of the construct (Values, Understanding, Social, Career, Protective, and Enhancement). The example of the item is "*by becoming a volunteer I don't feel lonely*". Item analysis using Rasch method is examined to check the items of the scale. Result shows that motivation to volunteer in 108 Indonesian sample aged 18-59 years old (M=26.82; SD=5.66) is multidimensional construct (RMSEA<0.08; CFI>0.9; TLI>0.89). Rasch analysis show good person reliability (0.87) and good item reliability (0.96). All items have good psychometric evaluation. However, based on Rasch analysis, it is identified that an item has differential item functioning (DIF). The feeling of being needed when volunteering was higher in the male sample than in the female sample. The findings provide empirical evidence that motivation to volunteer with Indonesian sample is multidimensional construct. Besides, an item should be revised, so there is no gender bias. The findings of this study can be used to develop a further research about motivation to volunteer especially in Indonesia sample with its culture and norm.

Keywords: Construct, Motivation, Rasch, Validity, Volunteerism

## Introduction

Volunteerism has many advantages for the individuals who volunteer and for the community they serve. For the community, it can solve the community needs, give social impact for the organization, and contribute to positive social change (Snyder & Omoto, 2008). For the individuals, it benefits to personal growth (Borgonovi, 2016), professional development, social connections (Wilson, 2012), health and well-being (Gil-lacruz et al., 2019; Willigen, 2000; Wilson, 2012), and many more. There will be an disruption if volunteers not provided in many environment such in school, health, clinics, etc. (Stukas et al., 2016).

Volunteerism is also impactful form of prosocial behavior (Snyder & Omoto, 2008). Therefore, understanding the motivation of volunteerism is essential for researchers and practitioners. However, the study of volunteerism, moreover on motivation to volunteer is still not widely researched, especially in Indonesia (Akhtar et al., 2021). Based on Gallup's study, Indonesia is one of most generous country in the world (Clifton, 2018).

Volunteerism is different with helping others (Clary et al., 1998). It is the form of planned helping (Penner, 2004). Clary et al' study examine that volunteerism is actively searching opportunities to help people and may take an amount of time and commitment to the particular activities in helping others. Volunteering involves long-term, planned, and beneficial prosocial behavior for strangers, and usually occurs in an organizational setting (Penner, 2002).

Motivation is a core concept in volunteerism research because it influences individual decisions to initiate, maintain, and end volunteer activities (Clary et al., 1998). Studying motivations for volunteering not only provides insight into the drivers of volunteer behavior but also highlights the diverse needs, values, and aspirations of volunteers. By understanding these motivations, organizations and policymakers can develop more effective strategies for recruiting, retaining, and supporting volunteer efforts.

The measurement of motivation to volunteer is important to research. The dominant research about motivation to volunteer use Volunteer Functions Inventory (VFI) by Clary (1998) (Zhou & Muscente, 2022). This study aims to examine the motivation to volunteer construct in Indonesian sample, that never be done in the previous study.

Based on VFI, there are six functions that motivate volunteerism. Values, is function that express value that related to altruistic and humanitarian concerns for others. Understanding, is the function involves the opportunity for volunteerism to permit new learning experiences and the chance to exercise knowledge, skills, and abilities. Social, is the functions that concern relationship with others. Career, is the function that related benefits that may be obtained from volunteering. Protective, is the function to protecting the ego; in volunteerism it may reduce guilt over being more fortunate than others and to address one's own personal problems. Enhancement, is the function that focus on psychological growth and development.

## Methods

### *Participants*

There were 155 participants on this survey that filled out the questionnaire by google form. However, on some questions such as "*this is not error question, please choose number 2"* to

ensure participants' focus. There were some participants who not followed the instructions, so about 47 participants dropped out. At the end, there were 108 data can be used in this study.

Participants in this research is 27 (25%) male and 81 (75%) female. The participants are aged from 18-59 years old (M=26.82, SD=5.66). In the categorization of 18-24 years old, there were 41 (38%) participants. It's about 63 (58.3%) in the 25-34 years old group and 4 (3.7%) in the 35-59 years old group. Most of them are working in private sector (35 participants or 32.41%) and college student (32.41%), and some of them are entrepreneur (8 participants or 7.41%), civil servants (6 participants or 5.56%), housewives (5 participants or 4.63%), freelancer, teacher, lecturer, etc.

The level of education of the participants is high school (23 participants or 21.30%), undergraduate level (67 participants or 62.04%), graduate level (18 participants or 16.67%). Most of participants are from Java (83 participants or 76.85%), Sumatera (12 participants or 11.11%), Sulawesi (9 participants or 8.33%), Bali-Nusa Tenggara (2 participants or 1.85%), Kalimantan and Papua (each 1 participant or 0.93%). About 44.44% or 48 participants have been volunteering for 0-1 years. There were 23 participants or 21.30% have been volunteering for 1-2 years, 20 participants or 18.52% have been volunteering for 2-5 years, and 17 participants or 15.74% have been volunteering for more than 5 years.

### *Measurements*

The instrument used in this research is Indonesian adaptation of Volunteer Functions Inventory by Clary et al (1998). The adaptation is done before this research with reliability index for the scale is 0.906 (Maharti, 2019). For each dimension, the Alpha Cronbach's is ranged from 0.687 – 0.858. This instrument consists of 30 items with each dimension consist of 5 items. The participants asked "How important or accurate each of the 30 possible reasons for volunteering were for you in doing volunteer work." The participants give respond each item on a 7-point scale ranging from 1 (not at all important/accurate) to 7 (extremely important/accurate).

### *Procedure and Analysis*

Data collected in this study is using non probability sampling technique. Survey collected across Indonesia, with criteria of respondent is above 18 years old. The participants filled out informed consent by google form.

Data analysis used in this study is Confirmatory Factor Analysis (CFA) and Rasch Model. CFA used to examine the six dimensions of the construct (Values, Understanding, Social, Career, Protective, and Enhancement). This analysis is running with MPlus software. Meanwhile, Rasch model used to examine the psychometric standard in allowing the same scale for the person and item (Stone & Wright, 1999). This analysis is completed using Winsteps 3.73 software.

## Results and Discussions

Using CFA, the researcher confirmed that motivation to volunteer is multidimensional construct with six dimensions, these are Values, Understanding, Social, Career, Protective, and Enhancement. The factor structure of the construct followed the standard of good indices

fit model with some statistics, such as root mean square error of approximation (RMSEA) < .08, comparative fit index (CFI) > .90, and Tucker–Lewis index (TLI) > .90 (Bentler, 1990; Brown, 2015; Browne & Cudeck, 1993). The results showed that motivation to volunteer construct is acceptable in good fit criteria: RMSEA<0.08; CFI>0.9; TLI>0.89. This multidimensional construct of the motivation to volunteer support previous study (Clary et al., 1998; Kim et al., 2010).

Based on the Rasch model result, it showed that there were two items do not meet the good quality of psychometric standard. Item V3: "*Saya mau menjadi relawan karena prihatin dengan mereka yang kurang beruntung dibanding saya* (I am concerned about those less fortunate than myself) and C1: "*Menjadi relawan adalah batu pijakan untuk karir saya di masa depan* (Volunteering can help me to get my foot in the door at a place where I would like to work.)" have Infit-Outfit MNSQ value not within acceptable range that is .5 – 1.5 (Linacre, 2018). Person reliability index is .87 and item reliability index is .96. These reliability index showed good statistics above the acceptable range, that is > .80 (Bond & Fox, 2015). The Wright Map below showed person measures and item calibration in the same scale.

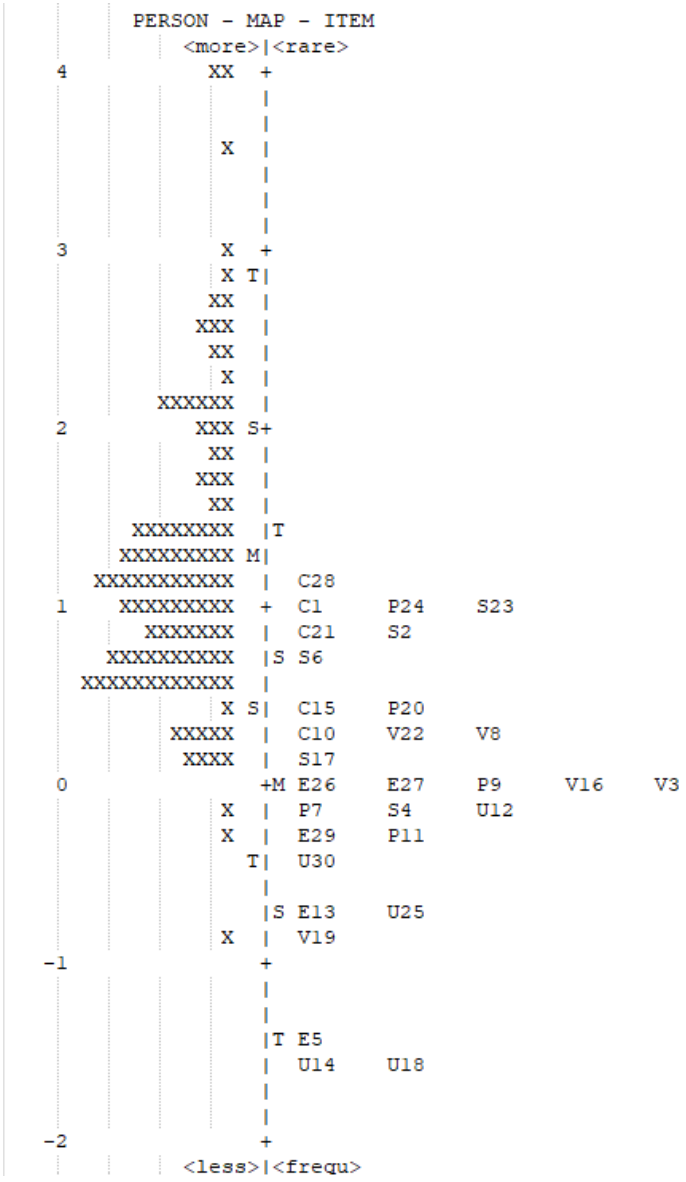



Figure 1: The Wright Map of Indonesian Adaptation of Volunteer Function Inventory

The map showed that average motivation to volunteer in Indonesia was higher than the average level of item difficulty of the scale. Item C28 is the least endorsed item: "*Pengalaman menjadi relawan penting untuk resume atau CV saya* (Volunteering experience will look good on my resume)". Meanwhile, item U14: "*Kerelawanan membantu saya mendapatkan perspektif baru tentang berbagai hal* (Volunteering allows me to gain a new perspective on things)" and U18: "*Kerelawanan membuat saya belajar melalui pengalaman langsung* (Volunteering lets me learn things through direct, hands on experience)" is the most endorsed item. This item was considered the "easiest" item by the Indonesian sample whose average age was 26 years old. This could happen because the majority of the sample had less than 1 year of experience volunteering, so motivation about new things was what they were looking for. From the Differential Item Functioning, it showed that item E26: "*Menjadi relawan membuat saya merasa dibutuhkan* (Volunteering makes me feel needed.)" indicated gender bias. The feeling of being needed when joining volunteer activities was higher in the male sample rather than female sample.

## Conclusion

This study focused on examine the multidimensional construct of the motivation to volunteer in Indonesia sample using Confirmatory Factor Analysis. Besides, this research also explores item validity using Rasch Model. Two items of the adaptation scale need to be revised based on infit-outfit value (V3 and C1). Item E26 also need revise due to gender bias. However, the person reliability and item reliability index showed good statistics. Further research focusing on this adapted instrument is needed, especially adjusted to Indonesia's culture and norm.

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# *The Magic of Colour: How Palette Choice Affects the Initial Trust Towards News Web-Interfaces*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
In the realm of online user interaction with web interfaces, trust is paramount. Our research focused on the pivotal role of colour schemes within news web interfaces and their correlation with the propagation of misinformation in modern media. We explored the influence of colour schemes on users' initial trust levels, particularly focusing on monochromatic schemes, including a binary black-and-white scheme, and variations in colour saturation. Results revealed significant differences in trust ratings for various colour schemes ($p < .001$), with substantial effect size ($\eta^2 = 0.569$). Higher trust ratings were observed for the black-and-white (mean = 3.888), green (mean = 3.724), and grey (mean = 3.625) schemes. Conversely, red (mean = 2.895), yellow (mean = 3.124), and blue (mean = 3.188) schemes yielded lower ratings. Notably, interfaces with less saturated background colours were generally associated with increased trust ($p = .036$). Furthermore, we examined the role of pre-existing beliefs on interface trust. Interestingly, these beliefs only significantly affected trust assessments when interfaces received high ratings ($p = .001$), emphasizing the cognitive aspect of overall assessments. These results underscore the significance of colour as a perceptual attribute in news interfaces and its impact on initial user trust. Moreover, the study highlights the interplay between emotional perception, influenced by colour schemes, and cognitive aspects, represented by pre-existing beliefs, in shaping users' judgments of interface trustworthiness.

Keywords: Online Trust, Colour, Colour Perception, Web Interfaces, Human Digital Interaction, Fake News

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## Introduction

Let's imagine that you're meeting someone new for the first time. You haven't interacted with them before, nor have you heard anything about them — this person is a blank slate for you. However, in the first few seconds of interacting with them, you form some initial impressions. Whether this person seems normal or not, whether they pose a threat to you, whether you want to continue interacting with them, and whether you're willing to trust them.

In the digital environment, trust is one of the important factors for the success of interactions between information consumers and providers (Möhlmann and Geissinger, 2018). The sweeping premise of all our research is that the basic structure and trust factors typical of the physical environment are preserved in the digital one, although with a few peculiarities. The main one is this: when you interact with anyone in the digital realm, you don't do it directly: there's always an interface between you and the other party (Marcella, 1999), which is the external shell of the system that makes this remote interaction possible. Consequently, the inevitable question arises: how do you understand whether this interface, as a mediator or an independent party of trust, can be trusted? This is where interface cues and prompts come to the rescue, serving as trust triggers (Lumsden, MacKay, 2006).

Trust can be defined as a generalized expectation shared between two or more parties, reflecting one party's willingness to rely on another even amidst uncertainty, thus providing a sense of relative security (Kosova and Gorbunova, 2023a). Initial, or primary, trust is conceptualized as a type of trust formed in the initial encounter (Koufaris, Hampton-Sosa, 2004), and t is presumed to play the most significant role in the digital space, abundant with opportunities to quickly switch to alternative information providers.

The previous researched identified four main types of interface cues, or interface elements that can contribute to the attribution of trust towards it by the user (Kosova, Gorbunova, 2023a): social abilities cues, content cues, structural usability cues, and atmospheric design cues. The first type, social abilities cues aim at creating an illusion of human-to-human instead of human-to-system, or human-to-interface interaction in the digital world. This type of cues, including for instance the indication of presence on social networks or the ability to view and to post comments, has already proven its relevance for web-based news interfaces (Kosova, Gorbunova, 2023b). The second type, content cues, refers to informational components of the website, including both their internal (e.g., content itself) and external (e.g., content form, such as text or video, emotional or neutral style etc.) characteristics. The third type, structural usability cues, includes website elements intending to enhance the perceived simplicity and usefulness of the interface (e.g., navigation bar, pages layout etc.). Finally, atmospheric design cues are used to convey company values and brand associations through appearance aspects, including at the subconscious level. Among them, colour schemes stand out as it is almost impossible to imagine a totally uncoloured web-interface (especially if you don't forget that achromatic colours are still colours).

Another question is: why news interfaces? What is so different about them? There are two reasons explaining why we focused our research on news interfaces. From a pragmatic perspective, studying news interfaces is now more useful and relevant than ever: fake news is becoming increasingly prevalent, it is easier to create them in various modalities due to the explosive development of artificial intelligence, thus users are faced with the task of recognizing untrustworthy sources. From a scientific standpoint, studying news interfaces is interesting simply because, from the perspective of trust, they have been largely unexplored

until now (except for Kaczmarek-Gajewska and McDonnell, 2021, for instance). This is probably related to some peculiarities of news interfaces that distinguish them from more commonly studied web interfaces, such as commercial, banking, or medical ones. Firstly, users often come to a news interface with a preconceived belief either about the quality of the resource itself or about the type of information the site should convey to the audience. This immediately brings to mind the problem of confirmation bias: the user expects that a trusted news source will support their viewpoint on issues important to them. Secondly, in the case of news interfaces, the condition of risk, or vulnerability of the trustor, which is crucial for trust formation (Evans and Krueger, 2011) becomes significantly less noticeable and obvious compared to usually studied interfaces. For example, when a suspicious online store website asks the user to enter their credit card details, the user understands that they are risking their money. However, when a suspicious news website asks the user to share fake news, the risk is more hidden and less well understood. Therefore, within the framework of our research, we set ourselves the separate task of highlighting the condition of risk for the user within the research paradigm to more reliably isolate the phenomenon of trust itself, rather than associated phenomena.

So, we have covered the specifics of news interfaces and conceptualized trust, leaving only colour to discuss. At its core, colour comprises light wavelengths interpreted by the brain into the spectrum of colours perceived by the human eye (Singh, 2006). From a psychological perspective, colour is a complex stimulus that goes beyond visual perception, interacting deeply with emotions, cognitive processes, and behavior, profoundly shaping human experience.

When we deconstruct colour into its constituents, we can distinguish three primary dimensions: hue, saturation, and brightness. Among them, hue determines the category of pure colours to which a specific stimulus belongs (e.g., red, blue, or green). Saturation describes the intensity of colour: is it more or less colourful? Chromatic colours (such as red, purple, orange, etc.) are less saturated than achromatic colours (such as grey or white). Brightness, or lightness, depicts the abundance of light in the colour: how much black or white is mixed in it.

To date, most colour-trust researched has focused on how trust is influenced by hue. Colour hue, viewed as a spectrum of hues, presents a complex array of shades, often categorized into discrete indicators like purple, blue, green, yellow, orange, and red. However, comprehensive studies covering the entire spectrum are rare due to the complexity of data collection and analysis. Among them, Bonnardel et al. (2011) investigated website appeal, evaluating 23 hues and finding blue and orange most preferred by ordinary users, with professional designers additionally favoring gray. Bottomley and Doyle (2006) linked various hues appropriateness to trust formation, noting congruence between product type and colour. Ha (2009) studied five hues (red, yellow, green, blue, purple) and associated blue and green with most successful trust for banking websites. Research often categorizes colour hues into warm and cool, with cool colours like blue consistently associated with higher trust levels compared to warm colours like red and yellow (Kim and Moon, 1998; Su et al., 2019; Coursaris and Swierenga, 2010). However, studies show cultural variations and complexities, such as preferences for warm colours in certain contexts (Hawlitschek et al., 2019; Khuong et al., 2018). Further research is needed to understand these nuances beyond simplistic warm-cold distinctions.

The effect of colour saturation on trust is significantly less frequently studied. Papachristos et al. (2005, 2006) developed a model linking colour to trust through machine learning techniques, identifying variables like hue, brightness, and saturation. Notably, the saturation of secondary colour influenced perceived site value even more than its hue. Pelet et al. (2009, 2011, 2013) found that low-saturated colours correlate positively with trust, competence, and professionalism, while highly saturated colours can be perceived as aggressive, negatively affecting trust. Skulmowski et al. (2016) and Pichierri and Pino (2023) support these findings, showing the negative impact of high saturation on website perception and consumer trust in green marketing, respectively.

Previous research has also established that users' pre-existing beliefs about the quality of a news interface or source can significantly influence trust. For instance, Ecker et al. (2014) found that users' prior racial beliefs influence their perception of news regarding a robbery whether committed or prevented by an Australian Aboriginal person. Čavojová et al. (2024) examined several predictors of trust in COVID-19 fake news and similarly concluded on the significant impact of consistent prior beliefs on trust and the desire to share news. Finally, Kosova and Gorbunova (2023b) demonstrated that pre-existing beliefs about a site's tendency to publish true or fake news are among the most significant additional factors influencing trust in interfaces containing social cues. However, in the context of evaluating news interfaces specifically, rather than the content itself, the impact of prior beliefs on the perception of the news source remains an underexplored issue.

Thus, we formulate the following hypotheses:

H1. Interface colour significantly influences the level of trust in a news web interface.
H1.1. Among all monochromatic schemes, schemes with cool hues (blue, purple, green) will receive the highest ratings on the trust scale.
H2. The saturation of the interface background colour significantly influences the level of trust in a news web interface.
H2.1. Among all monochromatic schemes, interfaces with less saturated dominant colours will receive higher ratings.
H3. Pre-existing beliefs will have a statistically significant impact on the evaluation of interfaces.

## Methodology

### *Participants*

The online study involved 119 participants (69 female, mean age 27.87, StD = 5.67). All respondents were native Russian speakers, had normal or corrected-to-normal vision, were not colour blind, and did not have psychological disorders. Participants were recruited through social networks and the Yandex.Toloka service. 37 respondents reported being in the process of obtaining higher education, 35 respondents reported having at least one completed higher education, 30 respondents had vocational education, and an additional 17 respondents reported having no higher education.

### *Materials*

The study was conducted online using a specially designed website, where questionnaires and stimulus materials were presented. The stimuli consisted of 48 screenshots of news interfaces

structured as follows: there were 3 basic designs, varying in interface hue and saturation of the dominant and secondary colours (if the dominant colour was less saturated, the secondary colour was more saturated, and vice versa). Eight colour schemes were considered: one dichromatic black-and-white and seven monochromatic (gray, red, orange, yellow, green, blue, purple). Images were created using Figma, with the "saturated" condition implying 100% colour saturation and the "unsaturated" condition implying 25% colour saturation. This ensured perceptible differences between them, making both colours clearly visible and easily recognizable by respondents.

For clarity in subsequent text, by "saturated" condition, we understand interfaces where the dominant colour was saturated and the secondary colour was unsaturated (in the case of the black-and-white scheme: the dominant colour was black, the secondary colour was white). By "unsaturated" condition, we mean interfaces where the dominant colour was unsaturated and the secondary colour was saturated (in the case of the black-and-white scheme: the dominant colour was white, the secondary colour was black).

To add realism to the stimulus material, we also used specially written fake news in the interfaces, covering neutral topics that did not elicit strong emotional reactions (primarily science and culture; excluding politics, religion, etc.). The news underwent preliminary verification for credibility through a survey of 10 respondents (5 were informed they were evaluating fake news, 5 were naïve) using two questions, each rated on a 5-point Likert scale:

- Could this have happened in reality?
- Do you believe this really occurred?

Only news items that scored an average rating above 2 for each question and a combined total of 5 across both questions were included as stimuli. Examples of the final stimuli with news in Russian are provided in Figure 1.

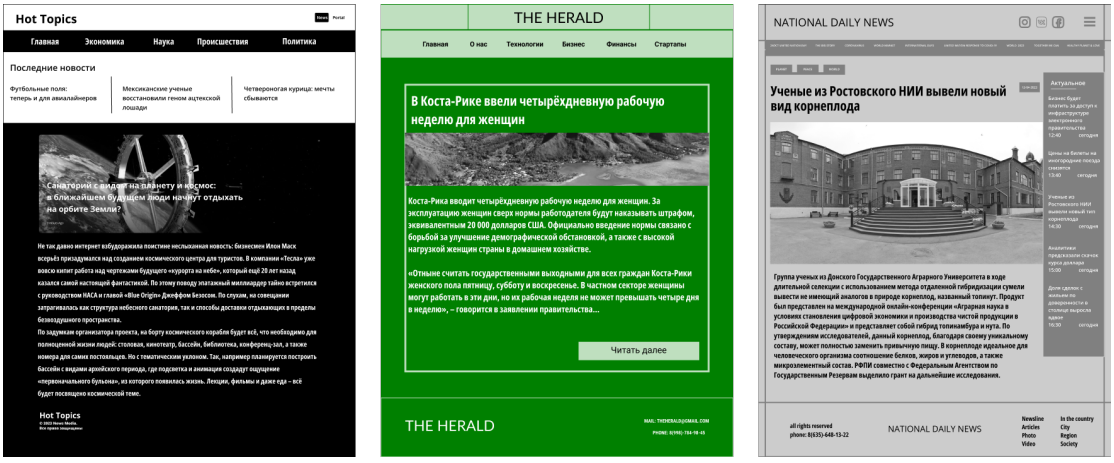



Figure 1: Examples of stimuli (saturated black and white, saturated green, unsaturated grey).

## *Procedure*

Prior to the experiment, all respondents provided informed consent to participate in the study and for the processing and analysis of their data. Subsequently, all respondents completed a demographic questionnaire (questions about gender, age, education level) and a behavioral questionnaire (frequency of reading news online, frequency of following links to the original news source, frequency of double-checking news information, and the model of information source selection online: reading only from a fixed list of trusted sources, having no fixed list

but reading only from sources with a good reputation, reading only from sources recommended by trusted individuals, or reading everything that comes into their information field).

Next, respondents were randomly assigned to three groups of prior belief: G1 (N = 45) received an instruction disclaimer stating that all news in the experiment were fake, G2 (N = 35) received a disclaimer stating that all news in the experiment were true, and G3 (N = 39) served as the control group and received no disclaimer. At the end of the experiment, respondents were asked if they received any disclaimer and which one, to ensure that the condition was understood. Only respondents who accurately characterized their group based on the disclaimer were included in the final sample.

Except for the disclaimer, the instructions for the different experimental groups were identical. Respondents were asked to imagine themselves as managing editors of a news aggregator (a popular media format in Russia that collects news from various sources and publishes them on one platform); their task was to select trusted sources for publication on their media platform. We specifically formulated and highlighted two risk conditions: hypothetical (if you select sources "poorly," your media outlet will lose readers and money) and real (if you select sources "poorly," you will not be able to participate in a small financial reward lottery). After reading the instructions, participants proceeded to the main part of the experiment, during which they were presented with 48 stimuli, as described in the Materials section, where for each stimulus participants answered two questions: rate how much they trusted the source (on a 6-point Likert scale) and decide whether they wanted to choose that source for their news aggregator (yes or no). A schematic representation of the procedure is presented in Figure 2.




Figure 2: Experiment procedure

## Results

First and foremost, we examined whether the colour of the interface has a statistically significant impact on trust towards it. To do this, we checked the normality of data distribution in colour groups using the Shapiro-Wilk test (we will conduct it for selecting the analysis method for each variable). Subsequently, since the distribution in some groups was non-normal, we tested the null hypothesis of no influence of colour scheme on trust ratings using the Kruskal-Wallis test. The obtained results ($p < 0.001$, $H = 67.11$, $\eta^2 = 0.57$) indicate that the colour scheme significantly influences the level of trust, with a considerable effect

size. The top three leaders in terms of trust levels among the colour schemes are the sole dichromatic black-and-white, as well as the monochromatic green and gray. More detailed descriptive statistics for each colour scheme are provided in Table 1.

| **Colour scheme** | **Mean trust** | **StD** | **25%** | **50%** | **75%** | **P-value for saturated vs. unsaturated version** |
|---|---|---|---|---|---|---|
| Black & white | 3.89 | 1.15 | 3.17 | 4.00 | 4.67 | < 0.001 |
| Green | 3.72 | 1.20 | 3.00 | 3.83 | 4.67 | 0.01 |
| Grey | 3.62 | 1.18 | 2.83 | 3.83 | 4.50 | 0.07 |
| Orange | 3.48 | 1.08 | 2.83 | 3.50 | 4.25 | < 0.001 |
| Purple | 3.48 | 1.22 | 2.58 | 3.50 | 4.42 | 0.07 |
| Blue | 3.19 | 1.13 | 2.42 | 3.00 | 4.00 | < 0.001 |
| Yellow | 3.12 | 1.19 | 2.33 | 3.17 | 4.00 | < 0.001 |
| Red | 2.89 | 1.22 | 1.92 | 2.83 | 3.83 | < 0.001 |

Table 1. Trust scores for colour schemes

Next, we categorized the colours into three groups: cool colours (blue, purple, green; mean trust for group = 3.46, StD = 1.60), warm colours (orange, yellow, red; mean trust for group = 3.17, StD = 1.61), and neutral, or achromatic, colours (black-and-white and gray; mean trust for group = 3.62, StD = 1.57) — and compared their results using the Kruskal-Wallis test. The obtained results ($p < 0.001$, $H = 60.77$, $\eta^2 = 0.01$) indicate a statistically significant difference between the groups, although the effect size is quite small.

Next, we analyzed the impact of saturation on trust. It is important to note that since the stimuli were monochromatic, the saturation of the dominant and secondary colours varied simultaneously and had an inverse relationship: if the dominant colour was saturated, the accent colour was not, and vice versa. Since in this case the data in both groups had a normal distribution, we conducted a paired t-test, which showed a statistically significant difference between the groups ($p = 0.04$), with a moderate effect size (Cohen's $d = 0.29$). It should be noted that the statistical significance of saturation remains even when excluding the black-and-white colour scheme ($p = 0.03$, $d = 0.30$). Descriptive statistics for the groups considering the black-and-white scheme are presented in Table 2.

| **Dominant colour saturation** | **Mean trust** | **StD** | **25%** | **50%** | **75%** |
|---|---|---|---|---|---|
| Saturated | 3.29 | 0.96 | 2.75 | 3.17 | 3.89 |
| Unsaturated | 3.56 | 0.96 | 2.98 | 3.58 | 4.08 |

Table 2. Trust scores for dominant colour saturation levels

Using the Wilcoxon test, we also compared the saturated and desaturated conditions for each colour scheme. The obtained results (presented in Table 1) indicate that the difference between these conditions is statistically significant for all colour schemes except for gray and purple.

Finally, we examined the impact of pre-existing belief on the evaluation of interface trustworthiness using one-way ANOVA. The results showed no statistically significant effect ($p = 0.18$, $F = 1.72$). Descriptive statistics for the groups are provided in Table 3.

| **Dominant colour saturation** | **Mean trust** | **StD** | **25%** | **50%** | **75%** |
|---|---|---|---|---|---|
| G1: all news is fake | 3.29 | 0.96 | 2.65 | 3.25 | 3.70 |
| G2: all news is true | 3.67 | 0.95 | 3.25 | 3.60 | 4.24 |
| G3: control group | 3.36 | 0.86 | 2.76 | 3.20 | 3.99 |

Table 3. Trust scores for prior judgment groups (all colours)

Considering the results of previous studies (Kosova and Gorbunova, 2023b), where a statistically significant impact of pre-existing belief was observed only for the group of interfaces perceived as more trustworthy (interfaces containing a social cue), we isolated the top three trustworthy colour schemes (black and white, green, and gray) and separately tested for the presence of the pre-existing belief effect using one-way ANOVA. In this scenario, a statistically significant difference was indeed found ($p = 0.001$, $F = 6.87$), although the effect size remained negligible ($d < 0.001$). Additionally, we conducted pairwise comparisons between the groups using unpaired t-tests (this increases the risk of Type I error with multiple comparisons, however, in this case, we were interested in the relationships between individual groups). The results showed a statistically significant difference between G1 and G2 ($p = 0.001$), as well as between G2 and G3 ($p = 0.001$), which indirectly suggests that among the declared forms of pre-existing belief, it is the positive belief (the site publishes truthful news) that primarily influences trust.

## Discussion

The first point of note lies in the analysis of individual colour schemes, where the leading positions are taken by the achromatic neutral black-and-white, cool green, and neutral gray. Interestingly, the blue scheme, conversely, finds itself among the outsiders, despite the discussion in the Introduction section of the study, which predominantly concludes that blue is the most trustworthy colour (it is worth noting though that the bulk of such studies compare blue with red — and here, as in previous literature, blue still surpasses red in terms of trustworthiness). We attribute these results to two potential explanations. Firstly, it is important to consider the specific design where monochromatic interfaces were tested, which are rare in themselves and may trigger distrust due to their unfamiliarity, leading to anomalous results. Secondly, in response to the open-ended question “What do you pay attention to when deciding whether to trust a news source?” users consistently emphasize the neutrality of the source — and in this sense, achromatic black-and-white and gray schemes stand out, which some researchers associate with the absence of strongly expressed emotional connotations, unlike chromatic colours (Jue and Kwon, 2013).

The saturation of the dominant colour also exerts a significant influence on the level of trust (and this thesis holds true both when considering the black-and-white scheme, for which a strict definition of saturation or desaturation of the dominant colour is not entirely accurate,

and without its consideration). Overall, the results aligned with our expectations: interfaces with less saturated dominant colours received higher ratings on the trust scale. Such results can be explained by the fact that vibrant and saturated colours are perceived as more emotionally charged, promotional, and sometimes even more aggressive, while less saturated colours are associated with competence and professionalism (Pelet and colleagues, 2013).

The influence of pre-existing belief remains an interesting topic for further research. The effect of pre-existing belief itself is likely associated with a phenomenon known as confirmation bias (Nickerson, 1998; Cook et al., 2015). Our results indicate that this factor may have secondary significance in assessing the trustworthiness of the interface: a statistically significant effect is observed only for interfaces that do not elicit user affective rejection of the colour scheme. Interestingly, statistically significant differences in pairwise comparisons are only found when comparing with G2, which received the pre-existing belief that all news is truthful. This can be interpreted as follows: a trustworthy colour scheme contributes to a statistically significant increase in the level of trust in any case; moreover, if the user is already willing to trust the interface, their level of trust in the trustworthy colour scheme will be significantly higher than that of other user groups. Indirectly, this may indicate: a) the primacy of the affective component, as the influence of the colour scheme is evident regardless of cognitive pre-existing belief; b) the potential significance of the confirmation bias phenomenon in evaluating quality news interfaces: the user's readiness to trust the site is significantly reinforced by the trustworthy digital scheme.

## Conclusion

In the context of online user interaction with web interfaces, trust emerges as a critical factor. Our investigation underscores the critical role of monochromatic colour schemes in shaping users' initial trust levels within news web interfaces. Neutral black-and-white, cool green, and neutral gray schemes emerged as top performers, challenging conventional beliefs about the trustworthiness of blue colour. The saturation level of the dominant colour also significantly influenced trust, with less saturated dominant colours generally receiving higher ratings. Moreover, while pre-existing beliefs exerted a secondary influence, they significantly impacted trust assessments only in the absence of colour-induced aversion. These findings illuminate the complex interplay between emotional perception, cognitive biases, and colour psychology in determining interface trustworthiness, offering valuable insights for enhancing credibility and combatting misinformation in digital media environments.

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# *A Study of Cyberbullying Patterns Among Thai Youths*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
This research is a survey research with the objectives to 1) obtain the pattern of cyber bullying among Thai teenagers 2) know the personal factors (gender, family, hours of internet use, and number of internet access devices) affecting the pattern of cyber bullying in Thai youths and 3) use the obtained model to analyze impacts related to the brain, mind, and learning and create a program to reduce such impacts. The sample group consisted of 405 teenagers aged 18-22 years in Chonburi province who completed electronic questionnaires consisting of 1) general information questionnaire 2) Adolescent Cyber-Aggressor Scale (CYB-AGS) 3) Cyber-Victimization Scale (CYBVICS) and 4) Cyberbullying Bystander Scale (CBS). The data was analyzed using descriptive statistics and the survey data was analyzed using Repeated One-way: ANOVA. The research found that 1) overall, youth have Patterns of being a passive witness to cyber bullying. 2) Male and female teenagers have a pattern of being passive witnesses to cyberbullying than do alternative genders, at a statistical significance of .05.3) Youth living with their father or mother had significantly higher cyberbullying patterns than youth living with both parents and youth living alone at the level .05. For the variables Internet usage hours and number of Internet access devices, there were various and unrelated patterns related to cyberbullying.

Keywords: Cyberbullying Patterns, Gender, Family, Internet Hours and Number of Internet Access Tools

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## Introduction

In the digital world, where the internet and social media play an important role in human life. Most of the activities that once took place in the real world now take place in cyberspace. One thing that is emerging and is a big problem today is cyber bullying, which is the act of harassing another person using digital technologies such as social media, texting, gaming, and mobile phones, etc. Cyberbullying is repetitive behavior and is intended to shock, upset, anger or embarrass the victim. Through various methods such as lying or posting embarrassing pictures of others on social media, sending threatening messages, vulgar messages to harass the target (Olenik-Shemesh, Heiman and Zur,2019) by various media such as emails, chat rooms, social networks such as Facebook, Twitter that can Interact and share, replicate instantly to a wide audience at any time of the day or night without revealing your identity.

Those who do these things may not be aware of the consequences and the information posted remains in the cyber media indefinitely (Ruiz, 2019). Cyberbullying is spread all over the world and affects the brain, mind, and learning of the harasser, the victim, and the victim. For example, Faryadi's research (Faryadi, 2011) found that 13% of 365 college students experienced emotional problems due to cyberbullying, which 85% stated that cyberbullying causes emotional and mental stress, 70.8% has a negative effect on academic performance, 16.6% said they had bullied others on campus at least 2 or 3 times a month, 1.1% had bullied people outside of the university at least 2 or 3 times a month. 20.8% had heard cyberbullying stories or being knowledgeable of bullying that occurs within the university. From research with respondents of various ages, it was found that 14.9% had been victims of cyber bullying, with 2.2% having experienced bullying in during the past month. Meanwhile, young people aged 18-25 years experienced the highest levels of cyberbullying over the past month. The elder had the lowest experience of cyberbullying among those aged 66 and over (Wang, Yogeeswaran, Andrews, Hawi, & Sibley, 2019). 80% of teens have experienced cyberbullying at least once (Lianos and McGrath, 2018). A study in Indonesia of secondary school students found that 80% experienced occasional to almost daily cyberbullying. A relationship has been found between being the victim of cyber bullying and students' level of psychological distress (Safaria, 2016). A total of 63 studies from 2015 - 2019 on cyber bullying among teenagers found that the prevalence rate of cyber bullies ranged from 6 - 46.3%, and the prevalence rate of cyber bullies ranged from 13.99 -. 57.5% and found that verbal violence is the most common form of cyberbullying (Zhu, Huang, Evans, & Zhang, 2021). In a Korean study, 34% of student respondents participated in cyberbullying, with 6.3% being a perpetrator, 14.6 % being a victim, and 13.1% being both a perpetrator and a victim. Boys have a higher percentage of cyberbullying than girls (Lee and Shin, 2017). In Thailand, cyber bullying tends to be more serious. From preliminary survey data in 2017, a study of cyber bullying from 14 countries around the world, it was found that 80% had been harassed in real life, 66% had been harassed once a week, 12% had been harassed every day, 45 % have been cyber-harassed at least once, a statistic 4 times higher than in the United States, Europe, and Japan (Pornnoppadol, 2017). Students who were cyber-harassed accounted for 54.57%, with female students having a higher chance of being harassed than male students. The most common form of bullying is 60.73% is gossip through online media, 42.86% of the reasons for bullying come from having had a dispute before in the real area (Lertratthamrongkul, 2021). Experiences of cyber bullying among 354 middle school students from 6 schools in Bangkok. It was found that 44.60% had experience of being victims of cyber bullying, with 33.1% being the perpetrators and 67.8% being victims of bullying (Auemaneekul, Powwattana, Kiatsiri, & Thananowan, 2020).

Cyberbullying has many direct and indirect effects, such as mental health effects including anxiety, stress, depression, self-harm and suicide (Kimalee, 2020). Decreased mental well-being (Sittichai & Smith, 2020). Low levels of self-control and higher levels of stress, with anger is a mediator between stress and cyberbullying (Lianos & McGrath, 2018). It was found that 13% of the survey participants experienced emotional problems, 85% experienced emotional and mental stress, 70% affected their studies (Faryadi, 2011). It was found that men with higher levels of social media use had more depression and anxiety, which predicted more cyberbullying and cyberbullying. In contrast, in women, depression and anxiety were not associated with cyberbullying (Schodt, Quiroz, Wheeler, Hall, & Silva, 2021). Researchers have found that cyberbullying is characterized by high levels of aggression, low empathy, depression, alcohol use, increased hostility problems, and psychopathology (Savage & Tokunaga, 2017). Victims often have low self-esteem, depression, anxiety, and suicidal thoughts and attempts (Mitchell, et al., 2016). While Cyberbullying Bystanders tend to show low levels of empathy (Van Cleemput, Vandebosch, & Pabian, 2014). Cyber-victim has higher cortisol secretion and greater perceived stress compared to Cyber-perpetrator and Cyberbullying bystander. Being Cyber-victim may stimulate the activity of brain areas. Hypothalamicpituitary -adrenocortical axis (González-Cabrera, Calvete, León-Mejía, Pérez-Sancho, and Peinado, 2017). Boys with high cyberbullying experience had higher levels of distress and smaller vlPFC structures compared to boys with low distress and low cyberbullying experience. Researchers suggest that stress affects brain development (du Plessis M. R., Smeekens, Cillessen, Whittle, & Güroğlu, 2019). McLoughlin and colleagues (McLoughlin, Lagopoulos, & Hermens, 2020) are the first researchers to assess cyberbullying situations by using functional Magnetic Resonance Imaging (fMRI) to measure how cyberbullying bystanders respond to stimuli. and found that such stimuli stimulate responses in many areas of the brain, including those linked to social and emotional processing. And they found that people who had not experienced cyberbullying had a greater response in brain regions responsible for feeling self-conscious. And they found that women had a stronger response to stimuli in the right ACC, a brain region that plays a key role in processing empathy when witnessing cyberbullying. Quinlan and colleagues (Quinlan, et al., 2020) studied the connection between adolescent brain development. Cyberbullying and schizophrenia have been investigated with changes in the volume of the left putamen, with a smaller size being associated with anxiety.

Boys are more likely to be cyberbullied while girls are more likely to be victims (Chang, 2021). 54.57% of students who were cyber-harassed, female students were more likely to be harassed than male students (Lertratthamrongkul, 2021). On the other hand, a survey of 1,817 teenagers between 13 and 17 years old (56% female) found that girls participate in cyberbullying. This has been traced back to an increased amount of online social activity and online contact. while boys had higher exposure to antisocial media content and predicted higher levels of victimization over time (Festl & Quandt, 2016). Across 27 empirical studies of LGBTQ people, between 10.5% and 71.3% of cyberbullying among young people has negative psychological and psychological consequences and emotion (suicidal thoughts and attempts, depression, lower self-esteem), behavior (physical aggression and loneliness), and lower academic performance (Abreu & Kenny, 2018).

The relationship between average daily internet use among high school students and having experienced cyberbullying was 54% among those who used the internet >3 hours/day, 39% compared to those who used the internet 1-3 hours/day, and 30% among users less than 1 hour/day (Chi, Lan, Ngan, & Linh, 2020). Information about children ages 11-15 (180,919 in 42 countries) who participated in the 2017-2018 School-Age Behavior Study. It was found

that being a cyber-perpetrator and being a cyber-victim were related to social media use (Craig, et al., 2020).

Adults who reported childhood experiences of higher levels of sibling rivalry and hostility were more likely to that will become a vice between siblings. Conversely, sibling bullying is associated with lower self-esteem and life satisfaction (Plamondon, Bouchard, &Lachance-Grzela, 2021). A review of the role of family variables in abuse and cyber-victims across 34 studies found that the most consistent dynamic variables were family communication and quality of family relationships. (López-Castro & Diana, 2019).

Therefore, the researcher is interested in studying the patterns of cyber bullying among Thai teenagers in order to know the characteristics of being a Cyber-perpetrator or Cyber-victim or Cyberbullying perpetrator-victim or Cyberbullying bystander, how are similar or different? And differences between the genders, which according to many studies are different and to obtain patterns of cyber bullying among the youth and gender population in Thailand that truly need help. With that help, strategies can be used to create assistance programs that are appropriate for this population group.

## Methodology

### Participants

The sample consisted of 400 people involved in cyberbullying among teenagers aged 17-22 years. The sample size was determined according to the views of R.V. Krejcie and D.W. Morgan (Krejcie & Morgan, 1970). Random sampling in higher education institutions in Chonburi Province, 400 people from a total of 49,528 people (Office of the Eastern Special Development Zone Policy Committee, 2018), gender not limited. Not specifying whether left- or right-handedness is voluntary through self-administered questionnaires related to executive functions and/or through an intermediary is anger that results in cyberbullying among teenagers. Criteria for selecting the sample included age 17 - 22 years, no serious illness that would be an obstacle to participating in the program, and consent to participate in research. The criteria for excluding the sample were those who did not complete the questionnaire.

### Measures

Research tools are the Cyber-Aggressor Scale (CYB-AGS) (Buelga & Pons, 2020) consists of 18 items that directly and indirectly measure cyberbullying. Ranked on a Likert scale of 1 (never) to 5 (always), these items measure youth' experiences as Cyber-perpetrator in the past 12 months with Cronbach's alpha = 0.94, the revised Cybervictimization Scale (CYBVIC) (Buelga, Cava, & Musitu, 2019) is an updated version of the 12 months cyber-perpetrator scale. Eighteen self-reported past experiences were rated on a scale from 1 (never) to 5 (always) by lemurs. Cronbach's alpha = 0.88. And the Cyberbullying Bystander Scale (CBS) (Sarmiento, Herrera-López, & Zych, 2019) has 40 items distributed among 6 factors. alpha=0.90 Defender of the cyber victim online has Cronbach's alpha = 0.91 and Reinforcer of the cyber bully online has Cronbach's alpha=0.94.

## Procedure

This research study is survey research to find patterns of cyberbullying among Thai teenagers. It consists of the following steps: 1) Collect and create tools used to survey personal information, including gender, age, education level, number of hours of internet use, type and number of tools for accessing the internet, and living with family. 2 ) Contact the creator of the scale and create a Thai version of the scale following the back translation process, including the Cyber-Aggressor Scale (CYB-AGS), Cybervictimization Scale (CYBVIC), and Cyberbullying Bystander Scale (CBS). 3) Verify the accuracy of personal measures and measures related to cyber bullying in the Thai version by experts. 4) Test all measures by doing a try out with a population of people who have the specified qualifications and test Reliability of all measurements with Cronbach's Alpha. 5) All measures were tested with 400 questionnaire participants in Chonburi Province. 6) Analyzed the data obtained from item 5 and processed with a computer statistical program. Both descriptive statistics and inferential statistics include t-test values and F-test values to explain and compare differences between hypothesized variables.

## Result

From Table 1 is information on youth involved in cyber bullying aged 18-22 years in Chonburi Province, 62.2% are 33.1% were female, 4.7% were male, and were transgender, respectively.

Table 1: Information on youth involved in cyber bullying aged 18-22 years in Chonburi Province

| Gender | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Female | 134 | 33.1 | 33.1 | 33.1 |
| Male | 252 | 62.2 | 62.2 | 95.3 |
| LGBTQ | 19 | 4.7 | 4.7 | 100.0 |
| Total | 405 | 100.0 | 100.0 | |

Comparative analysis of cyber bullying patterns among teenagers aged 18-22 years in Chonburi Province.

Table 2: ANOVA summary table for Comparative analysis of cyber bullying patterns classified by gender variable

| Variable | | SS | df | MS | F | p |
|---|---|---|---|---|---|---|
| Mean_CA | Between Groups | .440 | 2 | .220 | 1.954 | .143 |
| | Within Groups | 45.281 | 402 | .113 | | |
| | Total | 45.721 | 404 | | | |
| Mean_CV | Between Groups | .046 | 2 | .023 | .193 | .824 |
| | Within Groups | 48.225 | 402 | .120 | | |
| | Total | 48.272 | 404 | | | |
| Mean_CBSP | Between Groups | .483 | 2 | .241 | 1.710 | .182 |
| | Within Groups | 56.754 | 402 | .141 | | |
| | Total | 57.237 | 404 | | | |
| Mean_CBSV | Between Groups | .302 | 2 | .151 | .431 | .650 |
| | Within Groups | 140.782 | 402 | .350 | | |
| | Total | 141.084 | 404 | | | |
| Mean_CBI | Between Groups | 29.392 | 2 | 14.696 | 8.231 | .000 |
| | Within Groups | 717.778 | 402 | 1.786 | | |
| | Total | 747.170 | 404 | | | |

Note: SS sums of square, MS mean squares

From Table 2, it is found that the Cyberbullying bystander Ignorant model (CBI) or Passive outside online were significantly different at the .05 level, while the Cyberbullying bystander support perpetrator (CBSP), Cyberbullying bystander support victim (CBSV), Cyber-perpetrator, and Cyber-victim models were not significantly different.

Comparative analysis of cyber bullying patterns classified by living with family variables.

Table 3: ANOVA summary table for Comparative analysis of cyberbullying patterns classified by living with family variables (n = 405)

| Variable | | SS | df | MS | F | p |
|---|---|---|---|---|---|---|
| Mean_CA | Between Groups | 1.713 | 3 | .571 | 5.204 | .002 |
| | Within Groups | 44.008 | 401 | .110 | | |
| | Total | 45.721 | 404 | | | |
| Mean_CV | Between Groups | 1.250 | 3 | .417 | 3.554 | .015 |
| | Within Groups | 47.021 | 401 | .117 | | |
| | Total | 48.272 | 404 | | | |
| Mean_CBSP | Between Groups | .417 | 3 | .139 | .981 | .401 |
| | Within Groups | 56.820 | 401 | .142 | | |
| | Total | 57.237 | 404 | | | |
| Mean_CBSV | Between Groups | .144 | 3 | .048 | .136 | .938 |
| | Within Groups | 140.940 | 401 | .351 | | |
| | Total | 141.084 | 404 | | | |
| Mean_CBI | Between Groups | 12.871 | 3 | 4.290 | 2.343 | .073 |
| | Within Groups | 734.299 | 401 | 1.831 | | |
| | Total | 747.170 | 404 | | | |

From Table 3, it was found that the comparative analysis of cyber bullying patterns classified according to the variables of living with family when considered on a side by side basis found that the patterns Cyber-perpetrator and Cyber-victim are significantly different at the .05 level. While the Cyberbullying bystander Ignorant model (CBI), Cyberbullying bystander

support perpetrator (CBSP) and Cyberbullying bystander support victim (CBSV), there is no difference.

Comparative analysis of cyber bullying patterns classified according to the variable of hours of internet use.

Table 4: ANOVA summary table for Comparative analysis of cyber bullying patterns classified by internet hours variable (n = 405)

| Variable | | SS | df | MS | F | p |
|---|---|---|---|---|---|---|
| Mean_CA | Between Groups | 1.601 | 4 | .400 | 3.628 | .006 |
| | Within Groups | 44.120 | 400 | .110 | | |
| | Total | 45.721 | 404 | | | |
| Mean_CV | Between Groups | .576 | 4 | .144 | 1.208 | .307 |
| | Within Groups | 47.695 | 400 | .119 | | |
| | Total | 48.272 | 404 | | | |
| Mean_CBSP | Between Groups | .944 | 4 | .236 | 1.677 | .154 |
| | Within Groups | 56.293 | 400 | .141 | | |
| | Total | 57.237 | 404 | | | |
| Mean_CBSV | Between Groups | 2.501 | 4 | .625 | 1.805 | .127 |
| | Within Groups | 138.583 | 400 | .346 | | |
| | Total | 141.084 | 404 | | | |
| Mean_CBI | Between Groups | 86.554 | 4 | 21.638 | 13.102 | .000 |
| | Within Groups | 660.616 | 400 | 1.652 | | |
| | Total | 747.170 | 404 | | | |

From Table 4, It was found that the comparative analysis of cyber bullying patterns classified according to the variables of living with family when considered on a side by side basis found that the patterns Cyber-perpetrator and Cyberbullying bystander Ignorant (CBI), are significantly different at the .05 level. While the Cyber-victim, Cyberbullying bystander support perpetrator (CBSP) and Cyberbullying bystander support victim (CBSV), there is no difference.

Comparative analysis of cyber bullying patterns classified by number of internet access devices.

Table 5: ANOVA summary table for Comparative analysis of cyber bullying patterns classified by number of internet access devices (n = 405)

| Variable | | SS | df | MS | F | p |
|---|---|---|---|---|---|---|
| Mean_CA | Between Groups | .653 | 3 | .218 | 1.938 | .123 |
| | Within Groups | 45.068 | 401 | .112 | | |
| | Total | 45.721 | 404 | | | |
| Mean_CV | Between Groups | 1.983 | 3 | .661 | 5.728 | .001 |
| | Within Groups | 46.288 | 401 | .115 | | |
| | Total | 48.272 | 404 | | | |
| Mean_CBSP | Between Groups | 2.460 | 3 | .820 | 6.003 | .001 |
| | Within Groups | 54.777 | 401 | .137 | | |
| | Total | 57.237 | 404 | | | |
| Mean_CBSV | Between Groups | .961 | 3 | .320 | .917 | .433 |
| | Within Groups | 140.123 | 401 | .349 | | |
| | Total | 141.084 | 404 | | | |
| Mean_CBI | Between Groups | 79.727 | 3 | 26.576 | 15.967 | .000 |
| | Within Groups | 667.443 | 401 | 1.664 | | |
| | Total | 747.170 | 404 | | | |

From Table 5, It was found that the comparative analysis of cyber bullying patterns classified by the variable number of internet access devices when considered on a side by side basis found that the patterns Cyberbullying bystander Ignorant (CBI), Cyber-victim, and Cyberbullying bystander support perpetrator (CBSP) were significantly different at the .05 level. While the format There is no difference between Cyber-perpetrator and Cyberbullying bystander support victim (CBSV).

## Conclusion

Overall, it was found that teenagers had the Cyberbullying bystander Ignorant pattern more than the Cyber-perpetrator, Cyber-victim, Cyberbullying bystander support perpetrator (CBSP) and Cyberbullying bystander support victim (CBSV) patterns.

Male youth have a significantly higher pattern of Cyberbullying bystander Ignorant (CBI) than those of alternative genders at the .05 level, and female youth have a higher pattern of Cyberbullying bystander Ignorant (CBI) than those of sexual genders. Selected for statistical significance at the .05 level. The patterns of Cyberbullying bystander Ignorant (CBI) of male and female teenagers were not different. The patterns of being Cyber-perpetrator, Cyber-victim, Cyberbullying bystander support perpetrator (CBSP) and Cyberbullying bystander support victim (CBSV) among male, female and transgender youths were not different.

The pattern of being a Cyber-perpetrator of youth living with father or mother is higher than that of youth living with both father and mother, with statistical significance at the .05 level. And the pattern of being a Cyber-perpetrator of youth living with father or mother is higher than that of youth living alone, with statistical significance at the .05 level. As for the pattern of being a Cyber-perpetrator, youth living with father or mother and youth living with relatives are not different. Patterns of being Cyber-victim, Cyberbullying bystander support perpetrator (CBSP), Cyberbullying bystander support victim (CBSV) and Cyberbullying bystander Ignorant in youth living with father and mother, youth living with relatives and youth housing alone is no different.

The pattern of being Cyberbullying bystander Ignorant (CBI) of youth with internet usage hours of more than 9 hours per day is significantly higher than youths with internet usage hours of 5-6 hours per day and 3-4 hours per day. Statistically significant at the .05 level. There is no difference in the pattern of Cyberbullying bystander Ignorant (CBI) among youth with more than 9 hours of internet use per day and youth with 7-8 and 1-2 hours of internet use per day. The cyber-perpetrator pattern of youth who use the internet 7-8 hours per day is significantly higher than that of youth who use the internet more than 9 hours per day at the .05 level. Pattern of being a Cyber-perpetrator of youth with internet usage hours of 7-8 hours per day with youth having 1-2 hours of internet use hours per day, 3-4 hours per day and 5-6 hours per day There is no difference. and the pattern of being Cyber-victim, Cyberbullying bystander support perpetrator (CBSP), Cyberbullying bystander support victim (CBSV) in youth with internet usage hours of 1-2 hours per day, 3-4 hours per day, 5-6 hours per day, 7-8 hours per day, and more than 9 hours per day were not different.

The pattern of being a cyber-perpetrator in youth with 3 internet access devices is higher than in youth with 2, with statistical significance at the .05 level. There is no difference in the pattern of being a cyber-victim in youth with the number of internet access devices 3 versus 1 and more than 4. The Cyberbullying bystander support perpetrator (CBSP) pattern in youth with a higher number of internet access devices 1 than youth with 3, and in youth with 2 internet access devices, it is higher than youth with 3, with statistical significance at the .05 level. As for the Cyberbullying bystander support perpetrator (CBSP) pattern, there is no difference between youth with 1 piece and youth with 2 pieces and more than 4 pieces. And there is no difference between cyberbullying bystander support victim (CBSV) in youth with more than 4 and youth with 2 and 3. The pattern is Cyberbullying bystander Ignorant (CBI) in youth that is 2 pieces higher than youth that has 1 piece, in youth that is 3 pieces higher than youth that is 1 and 2 pieces, and in youth that is more than 4 pieces higher than youth that is 4 pieces higher. youth that has 1 piece with statistical significance at the .05 level. There was no difference in youth with 2, 3, and 4 pieces.

## Discussion

Overall, it was found that youth aged 18-22 in Chonburi province have more Cyberbullying bystander Ignorant (CBI) patterns than other patterns. This is consistent with a study of experiential, psychological, and situational factors influencing the behavioral reactions of 331 bystanders of cyberbullying in Seoul, South Korea. The majority were indifferent (n = 201, 60.7%), followed by defensive bystanders. (n = 101, 30.5%), supportive bystanders (n = 18, 5.4%) and bullying bystanders (n = 11, 3.3%) (Song & Oh, 2018) Study among young people in Malaysia. A total of 399 respondents were surveyed, including witnesses to cyberbullying (N = 194), victims (N = 117), and bullies (N = 26) (Balakrishnan & Norman , 2020). Research examining emotional reactions and actions related to cyberbullying, focusing on Cyber-perpetrator, Cyber-victim and Cyberbullying bystander among 1,158 Malaysian university students, indicates that 8% (N=93) were bullied. ,18.6% (N=216) were a victim, 15.2% (N=174) were bullied and victimized, and 53.4% (N=675) Cyberbullied bystander in the past year. (Balakrishnan, 2018). According to these studies, the percentage of Cyberbullying bystanders is higher than any other role. Significantly, it is necessary to deeply understand the nature and behavior of Cyberbullying bystanders as the impact their actions can have on the development, situation and experience of Cyber-victim and Cyber-perpetrator. While this is counter to other research that has found prevalence rates among groups involved in cyberbullying vary, for example, the most comprehensive classification study groups bystanders of cyberbullying into five sub-roles. There was a difference between

victim defenders (54.6%), victim advocates (18.3%), passive victims of bullying (22.7%), cyberbullying promoters (1.6%) and aggressors' assistants (2.2%). Positive behavior in the case of those who protect the victim, those who disrupt the situation and those who provide assistance. This is in contrast to teenagers who only support the victim but do not stop attacking the aggressor (González-Cabrera, León-Mejí a, Machimbarrena, Balea, & Calvete, 2019).

Male adolescents had a significantly higher pattern of being passive bystanders of cyberbullying than did homosexuals, and female adolescents had a significantly higher pattern of being passive bystanders of cyberbullying. Statistically at the .05 level, males and females were not different. This is consistent with research that supports the results of male bystanders of cyberbullying. For example, a study examining the gender and age of cyberbullying witnesses of 2,109 students in Australia analyzed the actions of cyberbullying witnesses when One friend found that victims of cyberbullying found that bystanders of cyberbullying were less likely to do anything or help the victim, while girls were more likely to help students who were cyberbullied than boys (Campbell, et al. , 2017) Research into the role of gender and brain activity when witnessing cyberbullying indicates that there is a significant relationship between BOLD signal and bullying witness scores in males but not females. This is in contrast to research studies of experimental situations that examine the influence of contextual factors. (Severity of the event) and the behavior of other bystanders) on the behavior of bystanders of cyberbullying, intent to help the bully or reinforce the bully in the case of harassment on Facebook, indicating that female bystanders of bullying Males are more likely to support cyber victims (Bastiaensens, et al., 2014). This is the form of being a witness to cyber bullying and supporting the victim. Patterns of being a victim of cyberbullying. Patterns of being a witness to cyberbullying. Supporting the bully. And there are no differences in patterns of cyberbullying among male, female, and genderqueer youth. For example, research on intervention by bystanders of cyberbullying indicates that there are no differences between males and females. In terms of being a bystander to cyberbullying who supports the victim (Lyndsay, Jenkins, Fredrick, & Nickerson, 2018), this is counter to research that finds that bystanders of cyberbullying are the most common, such as studies of the prevalence of Cyberbullying and moral consequences in the relationship between Big Five personality traits and cyberbullying in undergraduate students655 Significant gender differences were found in cyberbullying, with males reporting more cyberbullying than females in all three dimensions: perpetration; Victimization and bystander behavior (Patterson, Allan, & Cross, 2017) Review of empirical studies 27 Pieces that examined the impact of cyberbullying on LGBTQ youth found it to be between 10.5% and 71.3% (Abreu & Kenny, 2018).

Living with family and being a Cyber-perpetrator and being a Cyber-victim are significantly different at the .05 level, while being a Cyberbullying bystander support victim (CBSV), Cyberbullying bystander support There is no difference between perpetrator (CBSP) and Cyberbullying bystander Ignorant (CBI). The pattern of cyberbullying in youth living with father or mother was significantly higher than youth living with father and mother at the .05 level and higher than youth living with father or mother. Living alone has statistical significance at the .05 level. This is consistent with the results of research showing that the level of cyberbullying is higher among individuals with divorced parents than among individuals with intact families. (Ozden-Yildirim, 2019). Students from single-parent families have been found to be more likely to be cyber-harassed (Bevilacqua, et al., 2017). Individuals with divorced/widowed parents are more likely to be cyber-victims (Abdulsalam, Al Daihani, & Francis, 2017).

Hours of internet use and the pattern of being a Cyber-perpetrator and the pattern of being a Cyberbullying bystander Ignorant (CBI) are significantly different at the .05 level, while the patterns of being a Cyber-victim, Cyberbullying bystander support victim ( CBSV) and Cyberbullying bystander support perpetrator (CBSP) are no different.

The pattern of being a witness to cyber bullying among teenagers is that they use the internet for more than 9 hours per day. Higher than teenagers who have internet usage hours of 5-6 and 3-4 hours per day with statistical significance at the .05 level, consistent with a survey of the relationship between the average time of using the internet per day in Vietnam, 215 people did. An online survey found that the prevalence of having experienced cyberbullying was 54% among those who used the Internet >3 hours per day, compared to 39% among those who used the internet >3 hours per day, compared to 39% among those who used the internet 1–3. hours and 30% among users <1 hour (Chi P. L., Lan, Ngan, & Linh, 2020), which is counter to the increased prevalence of being a bully and being the victim of cyberbullying when More hours of internet use Students who use the website High social network and high experience of cyber victimization Tend to engage in a variety of bystander behaviors (Jia, Wu, Jin, & Zhang, 2022).

The number of Internet access tools and the modes of being Cyber-victim, Cyberbullying bystander support perpetrator (CBSP), and Cyberbullying bystander Ignorant (CBI) were significantly different at the .05 level, while Cyber-perpetrator was significantly different. and the form of Cyberbullying bystander support victim (CBSV) are not different. However, various research studies do not focus on the number of Internet access devices.

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# *Counseling and Coaching: Exploring the Core Similarities in Concepts, Behaviors, and Techniques*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
The boundaries between counseling and coaching have become increasingly blurred as both disciplines recognize the value of shared competencies and techniques. This article delves into the integration of counseling principles within the realm of professional coaching. It highlights how counseling skills can enhance coaching practices, drawing upon literature and case studies that demonstrate the effectiveness of this interdisciplinary approach. This synthesis of concepts, behaviors, and methodologies paves the way for a nuanced understanding of their application and potential implications for future practice.

Keywords: Coaching, Counseling, Competencies, Interdisciplinary

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## Introduction

In the evolving landscape of professional development, counseling and coaching are two fields that, although distinct in their origins and goals, have shown a growing intersection in competencies and techniques. The push towards a more integrative approach is not only a reflection of the shared skills between counselors and coaches but also of the changing needs of clients who seek comprehensive growth strategies. This article seeks to explore the theoretical and practical synergies between counseling and coaching, underlining the core similarities that enhance both disciplines.

## Literature Review

The examination of counseling and coaching reveals an intricate tapestry woven from shared methodologies and parallel educational trajectories. Scholars have illuminated the profound impact counseling skills exert within coaching contexts, particularly in enhancing the depth and efficacy of coaching interventions. The literature suggests that core competencies such as active listening, empathetic understanding, and goal setting are crucial pillars in both domains (Aboujaoude, 2020; Bachkirova, 2022; Ritcher, 2021). In addition, contemporary coaching practices have increasingly adopted solution-focused and positive psychology approaches, which originate from and are extensively utilized within counseling (Grant & Cavanagh, 2011). The transformative power of these methodologies is evident in their ability to foster resilience and a strengths-based perspective, promoting client autonomy and agency. However, despite the apparent congruence, there remains a necessity for clear ethical guidelines and scope of practice definitions to maintain the integrity and distinction of each profession (American Psychological Association, 2010).

The discourse on the symbiotic relationship between counseling and coaching delineates a nuanced interplay of methodologies and theoretical underpinnings that have shaped the evolution of both fields. Reflecting on the historical trajectory, coaching, albeit a younger discipline compared to counseling, has burgeoned into a multifaceted profession, addressing various aspects of personal and professional development. As illuminated by Passmore and Fillery-Travis (2011), coaching has transcended its nascent phase, diversifying into domains such as executive, life, and transformational coaching. Cox, Bachkirova, and Clutterbuck (2014), presents a panoramic view of coaching's theoretical diversity, encapsulating approaches ranging from cognitive-behavioral to positive psychology. This theoretical pluralism echoes the foundational tenets of counseling, which, as historical evidence suggests, has its roots in the late 19th century ( Leahy, Rak, & Zanskas, 2009).

The intersection of coaching and counseling manifests profoundly in their shared objective to facilitate personal growth and enhance life quality. The American Counseling Association (ACA) defines counseling as a professional relationship that aims to empower individuals and families from diverse communities to create and achieve wellness, Mental health, education and career goals (Capuzzi & Gross, 2013). This definition seamlessly aligns with the coaching ethos, setting the stage for Vandaveer et al. (2016) and subsequent studies to accentuate the thematic congruence between coaching and counseling, highlighting commonalities in relationship dynamics, ethical considerations, and the transformative potential inherent in both practices.

Intriguingly, the dialogue between the two fields has been enriched by the migration of professionals, such as therapists transitioning into coaching roles, which underscores the

fluidity and permeability of their boundaries (Aboujaoude, 2020; Bachkirova, 2022; Ritcher, 2021). This professional cross-pollination not only illuminates the shared skill sets and therapeutic philosophies but also raises pertinent discussions about the need for integrated frameworks that respect the distinctiveness yet leverage the synergies of coaching and counseling.

## Case Studies

Case study analysis serves as a testament to the efficacy of integrating counseling principles into coaching. Gerwe et al. (2017) provided compelling insights into how counselor-delivered coaching significantly enhanced the wellness and professional development of physician residents. This study underscores the capacity of counseling-informed coaching to not only mitigate burnout but also catalyze personal growth and self-reflection. Beyond healthcare, corporate settings have witnessed the adoption of counseling-informed coaching practices in leadership development initiatives (Joo, 2005). Coaching has shown to facilitate leadership agility and the capacity to navigate complex organizational dynamics. Similarly, academic environments have leveraged coaching techniques to support students in achieving educational outcomes, with counseling strategies being applied to enhance student engagement and success (Fielden, 2005). These following three scenarios, tailored to maintain confidentiality and represent a collective of experiences, showcase the successful application of coaching techniques underpinned by counseling insights. They demonstrate the potential of such integrative strategies in facilitating personal and professional growth across diverse contexts, from healthcare and academia to corporate environments.

Dr. Emma is a physician with ten year of experience, embarked on a coaching journey to enhance her leadership abilities as she navigated the complexities of her new role. Her coach utilized the WOOP goal-setting technique. Incorporating the WOOP goal-setting technique involves defining her “Wish,” identifying the best “Outcome,” recognizing potential “Obstacles,” and creating a “Plan” for each challenge she faces. Her “Wish” was to lead her team with efficacy and vision, creating an environment where communication and collaboration thrived. The coach used reflective listening and empathy to understand Dr. Emma's perspective—a skill that overlaps with counseling—yet maintained a coaching focus on formulating a forward-moving action plan.

Together, they envisioned the best “Outcome” for Dr. Emma's leadership within her department, which is characterized by open dialogue, mutual respect, and high performance. Acknowledging her strengths, specifically in the areas of medical expertise and patient care, helped Dr. Emma to recognize that these could be leveraged to inspire her team. Identifying “Obstacles” was a key step, and Dr. Emma acknowledged that her reluctance to delegate tasks and manage conflicts was a significant barrier. She had to confront her comfort zone of being the primary decision-maker and the anxiety around potentially escalating conflicts. The plan they devised was both strategic and practical. Dr. Emma resolved to delegate at least one weekly task to develop trust in her team's capabilities. She also committed to engaging in one-on-one conversations with team members whenever a conflict arose, instead of avoiding them. This plan was bolstered by agreed-upon 'if-then' statements, such as, "If I feel hesitant to delegate a task, then I will remind myself of the growth potential it provides my team." In times of conflict, her plan was, "If I notice a disagreement brewing, then I will schedule a mediation meeting to address it constructively." These proactive steps marked a shift from problem-oriented to solution-focused leadership.

Dr. Emma's coaching experience, bolstered by the WOOP framework, led to significant improvements in team dynamics. The coaching did not explore the origins of her challenges as counseling might; instead, it focused on envisioning a positive future and setting in motion concrete steps to achieve it. By applying the WOOP technique, Emma successfully transformed her leadership approach, leading to heightened team morale and improved collaboration.

Carlos is a graduate student in environmental studies, engaged in coaching to better manage his time and academic pressures. With his coach, they began with the "Circle of Personal Perspective" exercise, where Carlos took stock of various life areas, highlighting academics and personal efficiency as needing attention. In the coaching sessions, which borrowed elements from counseling, they examined the impact of stress on Carlos's as a college student. This introspection, while valuable, was only a precursor to action. The coach's approach steered the process toward proactive planning, focusing on the present and future, rather than the origins of his stress, which is a departure from traditional counseling methods.

Through their discussions, they devised a multifaceted plan. For his academic life, Carlos committed to strict time blocks for studying and research, aiming to refine his academic diligence. On the personal front, recognizing the toll of stress, they integrated mindfulness meditation into his routine, offering a reprieve during intense study sessions. Addressing his wellness, Carlos understood that physical activity and sleep were not mere adjuncts but foundations for academic success, thus scheduling regular exercise and improving sleep habits. Regarding relationships, he decided to fortify his support network by actively participating in study groups, which would serve his emotional needs and reinforce his time management goals.

Unlike counseling, which might explore the deeper "Why and from where?" of Carlos's stress, coaching concentrated on the "What now?"—helping Carlos to find solutions and develop coping skills for managing his workload. This coaching journey, incorporating the comprehensive lens of the "Circle of Personal Perspective," equipped Carlos with refined time management strategies and a balanced approach to his overall well-being and academic responsibilities. He emerged more adept at managing his studies and more grounded and connected, both to himself and his academic community.

Linda is a finance manager with aspirations to climb the corporate ladder. She initiated coaching to sharpen her negotiation abilities, which is a critical skill in her quest for career advancement. In the initial phase of her coaching, they implemented the "Coaching by the Numbers" technique to create a structured pathway for her development. They began by defining what Linda wanted to improve, her negotiation skills, and clarifying her agenda. Linda articulated why honing these skills was vital to her, as well as anchoring her drive in her aspiration to be recognized as a leader in her field. They then gauged her motivation on a scale from one to ten, and Linda rated herself a motivated eight out of ten a strong starting point indicating her readiness to engage in the growth process.

Next, they envisioned what a perfect ten would look like in Linda's negotiation skills, her best or ideal self, envisioning a scenario where she negotiated deals confidently and effectively, garnering respect, and favorable outcomes. Linda's current skill level, based on a realistic self-assessment, reported at a six out of ten. Together, they explored her strengths that contributed to the score of six, such as her analytical skills and financial acumen, and how these could be assets in her negotiations. To incrementally increase her skill level, Linda identified small steps that could elevate her score by one to two points. This included practicing negotiation tactics in low-stakes situations and seeking feedback from trusted colleagues. The action plan they

committed to involved targeted role-play exercises with her coach, enhancing her responses to real-time challenges and honing her adaptability in various negotiation scenarios.

Throughout the sessions the coach employed techniques reminiscent of counseling to explore how past experiences shaped Linda's negotiation approach. The focus remained firmly on actionable strategies rather than diagnosis or treatment of underlying issues. This practical focus of coaching, paired with the insightful depth typical of counseling, allowed Linda to confront and reframe her self-limiting beliefs, transforming them into stepping stones toward her professional goals. The result was a comprehensive development plan steeped in the self-improvement ethos of coaching yet enriched by the introspective insights of counseling. Linda's journey through "Coaching by the Numbers" not only bolstered her negotiation skills but also instilled a robust sense of self-efficacy, propelling her forward in her career.

## Conclusion: Implications for the Future

The synthesis of counseling and coaching is poised to reshape the landscape of professional development. Interdisciplinary training programs that incorporate both counseling and coaching competencies are emerging as a new standard for practitioners (Stober & Grant, 2010). These programs offer a comprehensive skill set that can be adapted to diverse client needs, suggesting a trend towards a more integrative practice model. Future research is called to focus on longitudinal studies to further substantiate the long-term benefits of this convergent approach. Policy-makers and professional bodies are also encouraged to consider the implications of these evolving practices, particularly in the context of establishing a unified competency framework and ethical standards. This evolution promises to solidify the role of coaching as a distinct yet complementary discipline to counseling, ultimately benefiting clients and practitioners alike.

The convergence of counseling and coaching opens new avenues for professional practice and client service. The interdisciplinary exchange of techniques and competencies signifies a shift towards a more holistic approach to development. As this integration deepens, it holds the promise of enhancing the effectiveness of both fields, providing clients with more robust strategies for personal and professional growth. The future of counseling and coaching lies in the recognition and utilization of their inherent synergies, informed by continued research and collaboration.

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# *Characteristics of Qualitative Research Methods in Clinical Psychology in Japan*

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The Asian Conference on Psychology & the Behavioral Science 2024
Official Conference Proceedings

**Abstract**
In the field of clinical psychology in Japan, many qualitative research articles have conducted Grounded Theory Approach (GTA) or Modified Grounded Theory Approach (M-GTA) analyses using semi-structured interviews. However, previous research is not limited to subjects in need of support, which is a characteristic of clinical psychology. Therefore, this study aims to clarify the characteristics of qualitative research methods in the field of clinical psychology in Japan, particularly focusing on those in need of support. We identified 152 articles on qualitative research from clinical psychology-related journals and selected 81 articles on subjects requiring support and their related personnel. Based on these articles, we created three categories including "characteristics of the subjects," "data collection methods," and "analysis methods," and created a control table to examine the characteristics of the subjects and data. The results showed that "semi-structured interview" was the method in the top 10% or more in the cross table of subjects and data collection methods in "medical care" and "social issues." Additionally, "GTA" and "M-GTA" were common in "medical care" and "social issues," and only "TEM" was found in "medical care" in the cross table of subjects and analysis methods. In the cross table of data collection and analysis methods, "semi-structured interview"/"GTA," "semi-structured interview"/"M-GTA," and "clinical practice records"/"other qualitative data analysis" were in the top 10% or higher. These results revealed that semi-structured interviews and GTA were the main methods used, whereas "clinical practice records" were examined using a variety of analytical methods.

Keywords: Qualitative Research Methods, Clinical Psychology, Japan

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## Introduction

Until recently, single case studies and quantitative research have been mainstream in the field of clinical psychology in Japan. However, in recent years, qualitative research methods have gradually been increasingly used. Nochi (2011) points out three reasons for this including (1) qualitative research is expanding its perspective to the theme of practice, (2) practice is also expanding its perspective to research methods other than case studies, and (3) there are commonalities between the skills of practice and those of qualitative research. Yamamoto (2014) also pointed out that the diversification of psychosocial problems has affected the diversification of clinical psychology practice and research subjects, the increasing sophistication of qualitative research, and the high affinity between qualitative and clinical psychology as factors in the spread of qualitative research in clinical psychology.

Qualitative research "emphasizes concrete cases, attempts to view them in their temporal and regional particularities, and attempts to understand people in relation to the local context in which they live" (Flick, 1995). Research questions in qualitative research indirectly suggest how to relate to the subject, and are about understanding the subject and phenomenon. Specifically, questions about "how (how)" and "what (what)" are referred to as "descriptive questions," while questions about how to relate to the subject are referred to as "prescriptive questions" (Chapman & Sonnenberg, 2000); Otani (2019) points out that the fundamental types of research questions are different. Otani (2019) notes that practitioners, such as physicians and teachers, ask, "What should I do?" to ask that question, although they often ask, "What is going on?" Simultaneously, "descriptive findings" can be used prescriptively in practice.

Qualitative research is also useful for managing phenomena in areas where there is little previous research (Hill et al., 1997). This characteristic is commonly observed in clinical practice. For example, they often involve subjects in areas where there is little previous research. In such cases, qualitative research, which is hypothesis-generating research, is conducted because it does not go as far as hypothesis testing as quantitative research does. Additionally, as Iwakabe (2010) points out, rather than learning about the "average tendency" of an unspecified number of people, clinicians will learn more about how experiences occur in a particular context, and by being exposed to the real words of people who have had those experiences, and therefore, will be more likely to conduct research that is oriented toward the meanings of a small number of hard-to-average subjects. This is a good fit for a research method oriented toward the meanings of a small number of subjects who are not easily averaged out.

McLeod (1999) describes the purpose of qualitative research in clinical psychology as threefold. First, qualitative research reveals the experiences of a particular group of people. For example, counseling clients with specific psychological problems (eating disorders, depression, physical disabilities), or people working in healthcare, or various helping professions may be asked about their experiences with helping. The knowledge of people with specific experiences can be very helpful to clinicians. The second type of research is the study of phenomena, such as client insights into psychotherapy, or treatment-related issues, such as reverse transference, which are revealed through interviews about these events and situations. By interviewing clinicians, we can examine how things that are not well-articulated in theory are handled in practice. The third type of research is reflective. Although there are relatively few examples of this type of research, clinical psychologists reflect on their views of people and the world, the nature of their helping activities, and the changes in themselves, and examine

their historical and cultural significance. In other words, the researcher's gaze is directed toward practitioners and theorists in clinical psychology, including themselves.

Additionally, problems in qualitative psychotherapy research include the invasive and excessive demands of interviews, which may result in ethical issues, the possibility of meeting confidentiality requirements, as well as the need for a background in literature, cultural studies, sociology, or philosophy to conduct good qualitative research.

Additionally, most psychotherapy research examines the effects of psychotherapy; qualitative research methods are not suitable for this type of research (McLeod, 1999). However, Reisetter et al. (2004) explored how qualitative research can inform counselor education and proposed the following four themes to explain the students' positive responses: (a) perceived worldview congruence, (b) perceived counseling theory and skills congruence, (c) perceived research identity and professional viability, and (d) the holistic nature of their perceptions and experiences. Qualitative research has various academic backgrounds including sociology and anthropology, and its methods are diverse (Iwakabe, 2010). How, then, has "qualitative research" been conducted in clinical psychology in Japan to date?

Yamamoto (2014) reviewed 14 studies of Grounded Theory Approach (GTA) in the field of clinical psychology in Japan and provided an overview. The results suggest that GTA can be classified into six categories in Japan and that it is a very useful research method for research on what has not been clarified thus far, especially in research on clinical psychology practice itself, while pointing out misunderstandings, variations, and lack of explanations in the methods used and reasons for their adoption. He also states that it is very meaningful to theorize what is often tacit knowledge as "knowledge from the field" (Nakamura, 1992). Additionally, Iida, Kamimura, and Hirata (2023) conducted a literature review of qualitative research articles, focusing on two representative Japanese journals in the field of clinical psychology, noting the following characteristics. They pointed out the large number of articles using GTA or Modified Grounded Theory Approach (M-GTA)[1] to analyze data collected using semi-structured interviews and the large variability in the number of subjects surveyed. However, Yamamoto's (2014) study is limited to GTA and does not fully cover the diversity of actual qualitative research methods; this aspect may have further changed over time since the time of the study. As mentioned earlier, Iida et al. (2023) included qualitative research published in journals related to clinical psychology and was not limited to subjects in need of support, which is strongly related to practicality and considered one of the characteristics of clinical psychology research. Additionally, no other survey has investigated the status of qualitative research methods for subjects in need of support in the field of clinical psychology. Therefore, this study focuses on subjects in need of support and examines their characteristics, data collection methods, and analytical methods to determine the characteristics of qualitative research methods in the field of clinical psychology in Japan. Based on the above, this study aims to clarify the characteristics of qualitative research articles on subjects in need of support in the field of clinical psychology.

[1] M-GTA is a qualitative study that developed from GTA but differs in many respects in the intercepting of data, coding, and the presence or absence of inter-subject comparisons (Fukushima, 2016). Yamamoto (2014) also notes that "while based on the claims of the original version, the M-GTA takes a pragmatist position, aiming to improve practicality, and emphasizes the generation of 'domain-adhesive theories' (Glaser & Strauss, 1967) rather than 'formal theories' (Glaser & Strauss, 1967)." Moreover, it is characterized by the fact that it leaves the evaluation of the generated theory to the "applicant" (Kinoshita, 2007) and, in a primary sense, to the "practitioner" (Kinoshita, 2007).

## Subject of Survey

For data collection, two representative journals in the field of clinical psychology in Japan were selected: "Journal of Japanese Clinical Psychology" and "Japanese Journal of Clinical Psychology." Qualitative research articles were published in these journals from 2010 to 2022. Qualitative research articles were selected if the research design was qualitative, practical, mixed quantitative and qualitative analyses, or psychological testing feedback sessions.

Single case and literature studies were excluded (see Noda (2019) for a discussion of single case studies).

## Conclusion

A total of 171 eligible papers were identified; of these, 82 papers, which were limited to those whose research subjects were "subjects in need of support and their related persons," were selected.

## Analysis 1

Coding and categorizing the characteristics of the "Subjects" and "Detailed Subject" of the targeted papers based on the categories of research papers published by the Japanese Society of Clinical Psychology in FY2023 (Table 1).

| **Subjects/Detailed Subjects** | **n** | (%) |
|---|---|---|
| **Psychotherapy** | **7** | (8.5) |
| Psychotherapy | 3 | (3.7) |
| Cognitive Action Therapy/Action Analysis | 2 | (2.4) |
| Trauma therapy (PE, TF-CBT, etc.) | 1 | (1.2) |
| Expressive therapy (box garden therapy, drawing therapy, etc.) | 1 | (1.2) |
| **Medical care** | **23** | (28.0) |
| Mental Disorders | 12 | (14.6) |
| Physical diseases (including orthopedics and surgery) | 4 | (4.9) |
| Clinical Practice at High Age | 3 | (3.7) |
| Perinatal and Pediatric Clinical Practice | 2 | (2.4) |
| Psychosomatic Disorders | 1 | (1.2) |
| Other (emergency medical care, medical personnel support, clinical trials, etc.) | 1 | (1.2) |
| **Education** | **14** | (17.1) |
| Non school attendance | 6 | (7.3) |
| School counseling (including childcare counseling) | 4 | (4.9) |
| Other (emergency assistance, etc.) | 2 | (2.4) |
| Student counseling in university | 1 | (1.2) |
| Special support for education | 1 | (1.2) |
| **Welfare** | **13** | (15.9) |
| Clinical care of children with disabilities (including visual and hearing impairments) | 8 | (9.8) |

| | | |
|---|---|---|
| Clinical abuse | 2 | (2.4) |
| Childcare Support Clinical | 2 | (2.4) |
| Institutional clinical (infant homes, nursing homes, maternal and child living support facilities, etc.) | 1 | (1.2) |
| **Justice and Corrections** | **2** | (2.4) |
| Victim Support Clinic | 2 | (2.4) |
| **Industry** | **3** | (3.7) |
| Employee Assistance Program and in-house psychological consultation | 2 | (2.4) |
| Reinstatement to support clinical | 1 | (1.2) |
| **Social Issues** | **17** | (20.7) |
| Withdrawal | 5 | (6.1) |
| Minority, Gender, and Sexual Dissonance | 4 | (4.9) |
| Addiction (alcohol, drugs, gambling, etc.) | 3 | (3.7) |
| Hetero cultural Understanding | 2 | (2.4) |
| Psychological Support after Disasters, Incidents, and Conflicts | 2 | (2.4) |
| Suicide Prevention | 1 | (1.2) |
| **Other** | **3** | (3.7) |
| Other | 3 | (3.7) |
| **Total** | **82** | (100.0) |

Table 1: Classification and number of “Subjects” and “Detailed Subject”

A control table was further exploratively created for the coded “characteristics of the subjects,” “data collection method” and “analysis method,” and the characteristics examined.

Iida et al. (2023) also coded the following items; however, this study focuses on the above-mentioned three items. O’Brien, Harris, Beckman, Reed, and Cook (2014) used the following 21 reporting criteria as references: year of publication, journal name, author, title, article type, subject, number of subjects, RQ, data collection method, analysis method, and illustrations.

## Result 1

Frequencies of 5% or more in the cross table of “Subjects” and “Data Collection Methods” are Medical care/Semi-structured interview (19.5%), Social Issues/Semi-structured interviews (12.2%), Education/Semi-structured interview, Education (7.3%)/Record of clinical practice (7.3%) (Table2).

| Data Collection Methodology/ Subject Characteristics | a | b | c | d | e | f | g | h | Total |
|---|---|---|---|---|---|---|---|---|---|
| Semi-structured INT | 16 | 6 | 6 | 1 | 2 | 1 | 10 | 1 | 44 |
| (%) | (19.5) | (7.3) | (7.3) | (1.2) | (2.4) | (1.2) | (12.2) | (1.2) | (53.7) |
| Semi-structured INTs /QSAs | 1 | | | | | | | 1 | 2 |
| (%) | (1.2) | | | | | | | (1.2) | (2.4) |
| Multiple semi-structured INTs | | | 1 | 1 | | | 1 | | 2 |
| (%) | | | (1.2) | (1.2) | | | (1.2) | | (2.4) |
| Individual INT survey | 2 | | | | | | 1 | | 3 |
| (%) | (2.4) | | | | | | (1.2) | | (3.7) |
| Multiple INT surveys | 1 | | | | | 1 | | | 2 |
| (%) | (1.2) | | | | | (1.2) | | | (2.4) |
| Group INT | | | 1 | | | | | | 1 |
| (%) | | | (1.2) | | | | | | (1.2) |
| Records of CP | 2 | 6 | 2 | | | 4 | 4 | | 18 |
| (%) | (2.4) | (7.3) | (2.4) | | | (4.9) | (4.9) | | (22.0) |
| Records of CP /QSAs | | | 1 | | | | | | 1 |
| (%) | | | (1.2) | | | | | | (1.2) |
| QSAs | 1 | 1 | | | 1 | | | | 3 |
| (%) | (1.2) | (1.2) | | | (1.2) | | | | (3.7) |
| QSAs /Semi-structured INT | | | | | | | 1 | | 1 |
| (%) | | | | | | | (1.2) | | (1.2) |
| Participant observation/Semi-structured INT/Individual INT survey | | | 1 | | | | | | 1 |
| (%) | | | (1.2) | | | | | | (1.2) |
| Document collection | | 1 | 1 | | | | | 1 | 3 |
| (%) | | (1.2) | (1.2) | | | | | (1.2) | (3.7) |
| Other | | | | | | 1 | | | 1 |
| (%) | | | | | | (1.2) | | | (1.2) |
| Total | 23 | 14 | 13 | 2 | 3 | 7 | 17 | 3 | 82 |
| (%) | (28.0) | (17.1) | (15.9) | (2.4) | (3.7) | (8.5) | (20.7) | (3.7) | 100 |

a: Medical care, b: Education, c: Welfare, d: Justice/Corrections, e: Industry, f: Psychotherapy, g: Social Issues, h: Other. Interview: INTs, Questionnaires: QSAs, clinical practice: CP

Table 2: Cross Table of “Subjects” and “Data collection Method”

Frequencies of 5% or more in the cross table of “Subjects” and “Method of analysis” are Medical care/GTA (12.2%), Medical care/M-GTA (6.1%), Medical care/TEM (6.1%), Social Issues/GTA (6.1%), Social Issues/M-GTA (6.1%), Education/Other qualitative data analysis (6.1%). The educational field is characterized by the fact that “other qualitative data analyses are also distributed among a relatively wide variety of research methods (Table3).

| Method of analysis/ Subject Characteristics | a | b | c | d | e | f | g | h | Total |
|---|---|---|---|---|---|---|---|---|---|
| GTA | 10 | 2 | 4 | | 1 | 3 | 5 | | 25 |
| (%) | (12.2) | (2.4) | (4.9) | | (1.2) | (3.7) | (6.1) | | (30.5) |
| M-GTA | 5 | 3 | 2 | 1 | 1 | 1 | 5 | 2 | 20 |
| (%) | (6.1) | (3.7) | (2.4) | (1.2) | (1.2) | (1.2) | (6.1) | (2.4) | (24.4) |
| TEM | 5 | 1 | | | | | | | 6 |
| (%) | (6.1) | (1.2) | | | | | | | (7.3) |
| Other qualitative data analysis | 2 | 5 | 2 | 1 | 1 | 2 | 2 | 1 | 15 |
| (%) | (2.4) | (6.1) | (2.4) | (1.2) | (1.2) | (2.4) | (2.4) | (1.2) | (18.3) |
| Meta-analysis of cases | | 2 | | | | | | | 2 |
| (%) | | (2.4) | | | | | | | (2.4) |
| KJ method | | | 1 | | | | 1 | | 2 |
| (%) | | | (1.2) | | | | (1.2) | | (2.4) |
| KJ method / Single case study | | | 1 | | | | | | 1 |
| (%) | | | (1.2) | | | | | | (1.2) |
| PAC Analysis | | | | | | | 1 | | 1 |
| (%) | | | | | | | (1.2) | | (1.2) |
| SCAT | | | 1 | | | | | | 1 |
| (%) | | | (1.2) | | | | | | (1.2) |
| Sequence analysis | | | | | | | 1 | | 1 |
| (%) | | | | | | | (1.2) | | (1.2) |
| Text mining | | | | | | | 1 | | 1 |
| (%) | | | | | | | (1.2) | | (1.2) |
| Mapping method(Ujiie and Takahama, 1994) | | | 1 | | | | | | 1 |
| (%) | | | (1.2) | | | | | | (1.2) |
| Issue Analysis | | | | | | 1 | | | 1 |
| (%) | | | | | | (1.2) | | | (1.2) |
| Methods of Phenomenology | 1 | | | | | | | | 1 |
| (%) | (1.2) | | | | | | | | (1.2) |
| Research methodology on the nature of collegiality | | 1 | 1 | | | | | | 2 |
| (%) | | (1.2) | (1.2) | | | | | | (2.4) |
| Quantitative III | | | | | | | 1 | | 1 |
| (%) | | | | | | | (1.2) | | (1.2) |
| total | 23 | 14 | 13 | 2 | 3 | 7 | 17 | 3 | 82 |
| (%) | (28.0) | (17.1) | (15.9) | (2.4) | (3.0) | (8.5) | (20.7) | (3.7) | (100) |

a: Medical care, b: Education, c: Welfare, d: Justice/Corrections, e: industry, f: Psychotherapy, g: Social Issues, h: Other

Table 3: Cross Table of “Subjects” and “Method of analysis”

Top 10% in the cross table of “data collection method” and “analysis method” are Semi-structured interview/GTA (24.4%), Semi-structured interview/M-GTA (17.1%), Records of clinical practice/Other Qualitative Data Analysis (12.2%).

| Method of analysis / Data Collection Methodology | a | b | c | d | e | f | total |
|---|---|---|---|---|---|---|---|
| Semi-structured INT | 20 | 14 | 4 | | | | 43 |
| (%) | (24.4) | (17.1) | (4.9) | | | | (52.4) |
| Semi-structured INTs/QSAs | 1 | 1 | | | | | 2 |
| (%) | (1.2) | (1.2) | | | | | (2.4) |
| Multiple semi-structured INTs | 1 | | | 1 | | | 3 |
| (%) | (1.2) | | | (1.2) | | | (3.7) |
| Individual INT survey | | 2 | | | | 1 | 3 |
| (%) | | (2.4) | | | | (1.2) | (3.7) |
| Multiple INT surveys | 1 | | 1 | | | | 2 |
| (%) | (1.2) | | (1.2) | | | | (2.4) |
| Group INT | | 1 | | | | | 1 |
| (%) | | (1.2) | | | | | (1.2) |
| Records of CP | 1 | 2 | 1 | 10 | 1 | | 18 |
| (%) | (1.2) | (2.4) | (1.2) | (12.2) | (1.2) | | (22.0) |
| Records of CP /QSAs | | | | | | 1 | 1 |
| (%) | | | | | | (1.2) | (1.2) |
| QSAs | | | | 2 | | | 3 |
| (%) | | | | (2.4) | | | (3.7) |
| QSAs/Semi-structured INT | | | | 1 | | | 1 |
| (%) | | | | (1.2) | | | (1.2) |
| Participant observation/ Semi-structured INT/ individual INT survey | | | | 1 | | | 1 |
| (%) | | | | (1.2) | | | (1.2) |
| Document collection | | | | 1 | 1 | | 3 |
| (%) | | | | (1.2) | (1.2) | | (3.7) |
| Other | 1 | | | | | | 1 |
| (%) | (1.2) | | | | | | (1.2) |
| Total | 25 | 20 | 6 | 16 | 2 | 2 | 82 |
| (%) | (30.5) | (24.4) | (7.3) | (19.5) | (2.4) | (2.4) | (100) |

a: GTA, b: M-GTA, c: TEM, d: Other qualitative data analysis, e: Meta-analysis of cases, f: KJ method, Interview: INTs, Questionnaires: QSAs, clinical practice: CP

*Those about Method of analysis with a frequency of less than 1 (1.2%) were omitted from the table. They included the KJ method/single case study, PAC Analysis, SCAT, Sequence analysis, text mining, mapping method (Ujiie & Takahama, 1994), Methods of Phenomenology, Issue Analysis, Research methodology on the nature of collegiality, and Quantitative III.

Table 4: Cross Table of “Method of analysis” and “Data Collection Method”

The characteristics of the use of qualitative research methods in the field of clinical psychology included “Semi-structured interviews” as a data collection method for “Medical care” and

"Social issues," and "GTA" and "M-GTA" as the analysis methods. This characteristic is similar to the results of Iida et al. (2023), and is common, even when the target population is limited to those who require support. As Yamamoto (2014) and others have pointed out, the GTA is currently being used to theorize what might otherwise be tacit knowledge.

Various analytical methods were used to explore "records of clinical practice," which were grouped under the category of "other qualitative analysis." It is important to consider the diversity of data collection and analytical methods when developing future research methods in clinical psychology. A detailed investigation of the methods of analysis used for collecting qualitative data and the types of collected data facilitated in identifying different analysis methods and their utility in clinical practice.

## Analysis 2

We further overviewed the papers in the three areas of "Medical care," "Education," and "Social issues" that were characteristic in the previous analysis and reviewed the characteristics of each area. Specifically, the characteristics of the subjects were examined in an exploratory manner by creating comparison tables for the coded "characteristics of the subjects," "data collection methods," "analysis methods," "number of subjects," and so on.

## Result 2

## Medical Area

Twenty three papers were found to be applicable. "Mental illness" accounted for approximately half (12 papers), followed by "physical illness" (4 papers), "old age" (3 papers), "perinatal/childhood" (2 papers), and "psychosomatic illness" and "other" (1 paper each).

Data were collected through semi-structured interviews in 15 cases and from more than 70% of papers in the medical field. Data were collected through interview formats, including multiple and individual interviews, from more than 80% of articles in the medical field. Additionally, there were two records of clinical practice, and one each of semi-structured interviews and questionnaires. In the mental illness category, data were collected through seven semi-structured interviews and three other interview formats. Two studies also collected data from clinical practice records.

The mental illness categories included schizophrenia, depression, narcolepsy, insomnia, neurodevelopmental disorders, Tourette's syndrome, and home nursing users. Regarding schizophrenia and Tourette syndrome, data were collected from subjects related to a person requiring support. In the case of mental illnesses or age groups that may be difficult to objectively recognize or adequately verbalize, there seems to be a tendency to interview subjects related to persons requiring support.

In the physical illness category, all data were collected through semi-structured interviews; in one case, a questionnaire was also used. Physical illnesses included childhood cancer, menstrual complications, and impaired physical functioning. In the case of diseases associated with impaired physical function, data were collected from individuals requiring support. Even in the physical disease category, interviews were conducted with persons related to the person requiring support when adequate verbalization was difficult.

In the old age category, all data were collected through semi-structured interviews with participants related to the person requiring support. All the participants included family members caring for elderly individuals. The interviews were probably conducted with subjects related to the person requiring support, as elderly people in need of care tend to have difficulty adequately verbalizing their needs. Additionally, in the case of family care, the burden on caregivers is serious; therefore, data collection seems to have focused on those who are related to the person requiring support.

In the perinatal/childhood category, all data were collected through semi structured interviews. The subjects included women who had experienced artificial stillbirths. One article included in the "psychosomatic" category was a semi-structured interview with a patient with atopic dermatitis, analyzed using M-GTA. There was also one article classified in the "other" category, which was a questionnaire survey of psychological interventions forward staff following the suicide of an inpatient. The free-response statements in the questionnaire were classified into categories, and the method of analysis was classified as Other.

As a general characteristic of the target population in the medical field, many studies have analyzed linguistic data obtained through semi-structured interviews with adults who can adequately verbalize. In the case of diseases, pathological conditions, and ages at which adequate verbalization was difficult, data were collected through semi-structured interviews with participants related to the person requiring support.

In the medical field, semi-structured interviews have been analyzed using GTA (10), M-GTA (5), and TEM (5). In the physical disease category, one and three analyses were performed using GTA and TEM respectively. In the medical field, GTA and M-GTA are often used to analyze semi-structured interviews. However, in the case of physical illness, the analysis is often performed using TEM, which focuses on the process of change over time.

Data from only one participant were analyzed using phenomenological methods. Additionally, two studies in which data were collected from clinical practice records were analyzed using TEM and other qualitative analyses (qualitative inductive analysis). Even for linguistic data, special analyses may be used such as when the number of subjects is small or when clinical practice records are used, depending on the characteristics of the data.

## Education Area

The number of applicable papers was 14. Regarding the general characteristics of the subjects of the applicable papers, those in need of support were university students (two papers), while the rest were teachers (four papers) and parents (three papers). The most frequent subcategory in the field of education was truancy-related (six papers). The main methods used to analyze truancy cases were meta-analysis (two papers), qualitative data analysis (two papers), M-GTA, and TEM. One characteristic of the data collection method was that the data were indirectly collected from the target children. A characteristic feature of this meta-analysis was that it was conducted using data collected from clinical practice records and case study articles. Regarding those targeting mothers, qualitative data analysis on mothers' own psychological transformations and family systems in truancy was conducted, focusing on the M-GTA. The next most frequent subcategory was articles on school counseling (four papers). Three were mainly aimed at teachers as the target audience, and one was aimed at SCs. Two of the four papers analyzed problems arising between teachers and SCs, such as counseling and

consultation with school counselors, from the teachers' perspectives. Three of the analysis methods were GTA (two) and M-GTA (one) using semi-structured interviews.

In summary, the following two points were identified as the characteristics of the educational domain of qualitative research in clinical psychology. First, a relatively large number of non-attendance cases were included. This is a reasonable result, considering that most of the activities of psychologists in the education field are aimed at dealing with truancy. Second, the study used indirect data collection and analysis, such as a meta-analysis of existing published case studies on truancy and data collection from family members. Second, many studies have examined the SC system and experiences of working with SCs from the perspective of teachers using qualitative analysis. Many psychologists in the educational field are engaged in SC work, and school counseling activities are being examined in Japan using both quantitative and case studies, as well as qualitative methods.

Other qualitative studies from clinical and psychological perspectives on bullying have not yet been conducted. Although bullying is a major problem in education in Japan, it can be considered a case study or quantitative research in clinical psychology. However, considering the nature of the bullying problem, in which it is particularly important to approach the victim and the subjective perception of the perpetrator, there is great merit in using qualitative research methods, and future studies are warranted.

**Social Issues**

The number of applicable papers was 17. The survey subjects were notable for the large number of parties in need of assistance. Specifically, five papers were on social withdrawal and four on LGBTQ. Others included addiction, women, foreign women students living in Japan, and executives who have lost a subordinate. Data collection methods included 10 semi-structured interviews and 4 records of clinical practice. As methods of analysis, GTA and M-GTA were used in five papers each. KJ method, Quantification Theory Type III, PAC analysis, sequence analysis, and text mining were used in one paper each. Two papers had to be categorized as "other qualitative data analysis" as they could not be categorized in any of the aforementioned methods. For these, pre-school children living in slum areas in developing countries and college students with suicidal thoughts were the subjects.

In the social withdrawal category, data for three papers were collected using semi-structured interviews, and records of clinical practice and e-mail texts were used in one paper each. In the LGBTQ category, all data were collected by semi-structured interviews.

When clarifying the process of experience of the research subjects, GTA and M-GTA, which categorize linguistic data and facilitate the depiction of processivity, were used more often. Meanwhile, seven papers used non-GTA and M-GTA methods. In many cases, the number of research collaborators is extremely limited for research subjects related to social issues due to their peculiarities. Therefore, it was inferred that the tendency is not to use methods such as GTA, which creates new concepts and generates new theories by finding relationships between concepts (Fukushima, 2016), but to use PAC analysis and text mining, which observe phenomena individually and decipher their structure, or analysis methods that must be summarized as "other qualitative analysis."

The social issue was the difficulty in obtaining cooperation for the survey. Social issues are an area of research in which it is difficult to obtain research cooperation. People with social issues

are the least likely to approach psychological support agencies, despite their need for psychological support. Clarifying the structure of their social issue and their psychological experience of it will facilitate an understanding of people's psychological needs and provide clues for developing psychological support methods based on those needs. In the future, analyzing how informed consent is obtained from people with social issues and how systems are set up to avoid ethical issues, such as anonymity and privacy violation, will be essential.

It can be inferred that clinical psychology-related researchers often select social issues as their research subjects because clarifying the psychological experience processes of the subjects in need of support and those involved with them provides basic data indispensable for providing psychological support.

## Summary and Future Issues

The characteristics of the use of qualitative research methods in the field of clinical psychology include "semi-structured interviews" as a data collection method for "medical care" and "social issues," and "GTA" and "M-GTA." Various analytical methods were used to study "records of clinical practice," which were grouped under the category of "other qualitative analysis." It is important to consider the diversity of data collection and analytical methods when developing future research methods in clinical psychology.

Therefore, as future issues, (1) a more detailed examination of "other qualitative data analyses" should be conducted, and (2) its characteristics may become clearer through comparison with the data collection and analysis methods of articles excluded from the scope of this study. It is possible to clarify the overall picture by incorporating data on clinical psychological research from other journals, such as Developmental Psychology Research and Educational Psychology Research. Because language is significantly influenced by region and culture, comparative studies between different countries may further clarify the characteristics of qualitative research in clinical psychology in Japan. This study provides basic data for such studies.

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# *Number of Value Levels to Be Learned Can Affect Short-Term Value Recall in Humans*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
Optimal decision making between multiple objects, requires accurate recall of each object's value. Value recall is known to be affected by a number of factors including the training duration and the number of objects, etc. Here, we hypothesized that the level of discrete values that has to be learned while other factors being equal impact recall. In this study, participants (n = 10) learned to associate abstract fractal objects with monetary rewards. The objects were divided into three groups with two, three or five reward levels, respectively. Importantly, the number of objects in each group, the dynamic range of values and the training duration were the same across the three groups and the low-level visual features were randomized between value categories. By the end of value learning, subjects were asked to indicate the value of each object using a sliding bar (unitary choice trials). Subjects' performance for all three groups were similar and not significantly different (2 level: 86.2%, 3 level: 87.7%, 5 level: 88.4%, $p>0.1$). Importantly, value memory tested around 2 hours later using the same unitary choice trials showed lower recall for the objects that belonged to groups with more reward levels (2 level: 84.6%, 3 level: 77.8%, 5 level: 64.2%, $p<0.05$). Our results suggest that all else the same, value resolution can affect value recall. It remains to be seen whether exposure to contexts with different value resolutions shapes subsequent choice behavior which may be suggestive of a framing phenomenon in our future studies.

Keywords: Value, Learning and Memory, Value Levels, Recall, Psychophysics

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## Introduction

Learning values of objects is necessary for humans and animals to fulfill their primary needs and to survive. For it is important to remember previously learned values when it comes to making decisions between a set of options. It has been shown that value memory depends on the procedure and duration of training (Farmani et al., 2024). Object value memory has large capacity for storing value of objects in humans (Farmani et al., 2022 and 2024) and primates (Ghazizadeh et al., 2018b). Objects may appear to be Good/Bad (with only two levels of value) or the value magnitude may be graded (Ghazizadeh and Hikosaka, 2021). When object values appear in a graded manner, the value resolution in the learning sets might have some kind of framing effect (Tversky and Kahneman, 1981) on memorizing object values in short-term. Most of the previous work concerned cases where subjects learned values of many objects associated with only two reward levels. Therefore, it is not clear if the memory capacity is affected by the number of reward levels independent of the number of objects.

To address this issue, we designed psychophysics experiments in which human subjects learn value of several objects in sets with different number of levels. To ensure that participants learned the exact value of objects, we frequently asked them about object values during training. An hour later, when we asked them about object values as a memory test, we observed different rates of value recall depending on the number of value levels in learning sets. Exploring the reason for this observation, we found that value recall is diminished for objects with intermediate values. As a consequence, retrieval rates are lower in sets that consist of more objects with intermediate values and this occurs in sets with more possible value levels during learning.

## Methods

In this study, we designed psychophysics experiments and ten volunteer human subjects (7 female, age: 27.2 ± 1.8) performed the task. All subjects gave written consent to participate in the experiment. All subjects received monetary reward based on their performance at the end of the task. The task consisted of two phases; the training phase and the memory test phase. The memory test phase was performed about one hour after the training phase had started.

### *Objects*

We used fractal objects with randomized low-level visual features from our previous studies (Ghazizadeh et al., 2018a). Each participant learned values of 22 fractals chosen randomly from a set of 100 fractals. In a 5-level block, subjects learn values of 5 fractals chosen randomly from {0,25,50,75,100}. Each value is assigned to exactly one object in a 5-level block. In a 3-level block, 6 fractals appear with values chosen randomly from {0,50,100}, with each value assigned to exactly two objects. In a 2-level block, 6 fractals appear with value either zero or 100 with each value assigned to exactly three objects.

### *Reward*

Each fractal was assigned with a numerical value in a 0-100 scale. Value amounts were corresponded with monetary reward. Participants were informed that they would receive 10% of their sum score in one of the training blocks chosen randomly. Participants received reward realizations at the end of the task.

### *Task*

The training phase consists of four blocks (Figure 1C). Values are offered either in 5 levels (two blocks), 3 levels (one block), or 2 levels (one block). Blocks are ordered pseudo-randomly in such a way that exactly one 5-level block occurs in the first two blocks and one in the last two blocks.

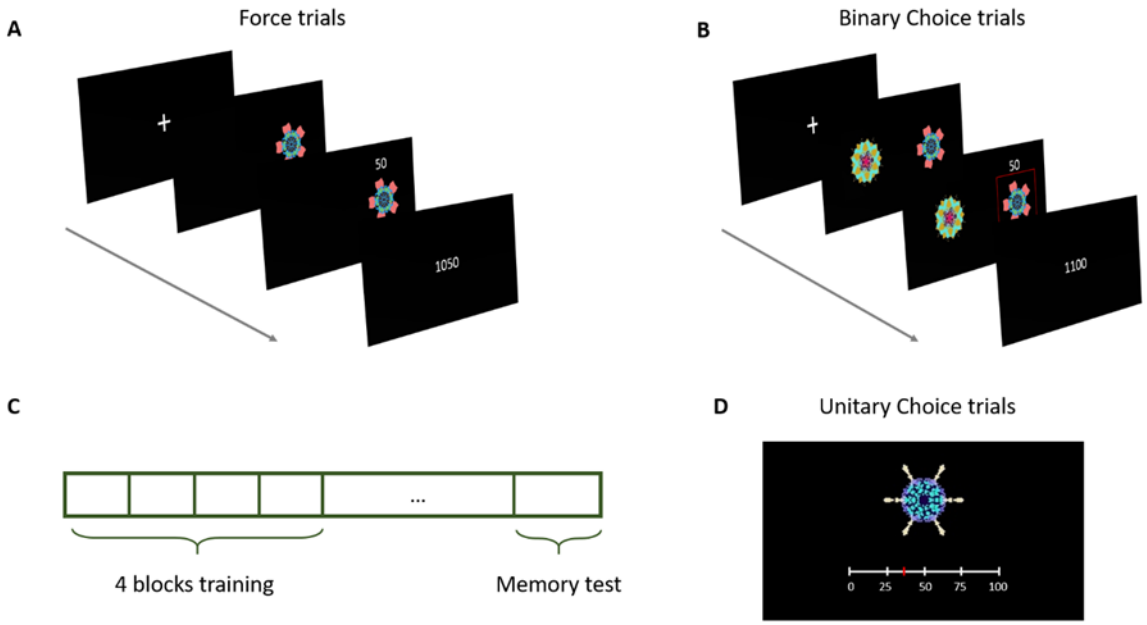



**Figure 1. Task structure**

During training, three types of trials force trials (**A**), binary choice trials (**B**), and unitary choice trials (**C**) appeared in random order.

### *Trials*

During training, three types of trials (force trials, binary choice trials, unitary choice trials) appear in random order respecting a block design; in 6 successive trials, there is at least one binary choice trial and one unitary choice trial.

In *force trials*, one fractal appears at the left or right side of the screen. Subjects are trained to press the left/right arrow key on the keyboard, respectively. After the key press, object value appears above the fractal (500 ms). A black screen with a white cross at the center appears after each trial (500 ms) and separates consecutive trials (Figure 1A).

In *binary choice trials*, two objects with non-equal values appear on the screen and participants are told to choose the object with the higher value by pressing the left or right arrow key (Figure 1B). After the key press, the chosen fractal is surrounded with a red square and its value appears above the object (500 ms).

In *unitary choice trials*, one object and a slider appear on the screen (Figure 1D). Participants are told to choose the object value on the slider with a mouse click. The slider permits for continuous choice of value in the range 0-100 and has ticks at 0, 25, 50, 75, and 100.

Each fractal appears 8 times in force trials (4 times at the left and 4 times at the right of screen). Any binary combination of non-equal valued fractals in one block appear 2 times with reversed left/right objects. Value of each fractal is asked 3 times through unitary choice trials with three different initial cursor positions on the slider; at the beginning (0), center (50), end (100).

### *Memory Test*

After an hour from the start of training, subjects answered the same unitary choice trials in random order repeated three times for each object. This stage served as the value memory test.

### *Data Analyses*

Data from one subject was excluded due to low performance (less than 50 percent) in some training blocks.

Performance of subjects in binary choice trials was defined as the percentage of correct choices (choice of the fractal with higher value) in such trials. Performance in unitary choice trials was defined in the same manner. Chosen amounts were considered correct if their difference with the object value was less than 5.

Statistical significance of results was tested with Analysis of variance (ANOVA) with $p = 0.05$ as the significance threshold.

## Results

Participants learned value of fractal objects in four blocks. In each block, values were learned either in 2,3, or 5 level steps. Blocks were ordered randomly for each subject. During training, in binary choice trials, two objects appeared and participants were asked to choose the fractal object with the higher value (Figure 1B). Subjects performance in these trials shows that values were learned properly in the training phase regardless of value level steps (2 level: 95.6% ± 1.5, 3 level: 95.1% ± 2.7, 5 level: 89.4% ± 1.5). Due to the random order of such trials, appearance of objects that were not learned in previous trials was possible and explains for non-perfect performance in these trials.

To ensure that subjects were learning exact values rather than their relative orders (ranks), we asked objects values explicitly in unitary choice trials (Figure 1D). In these trials subjects' performance was acceptable (Figure 2) and showed that subjects learned value amounts precisely (2 level: 86.2%, 3 level: 87.7%, 5 level: 88.4%, $p>0.1$).

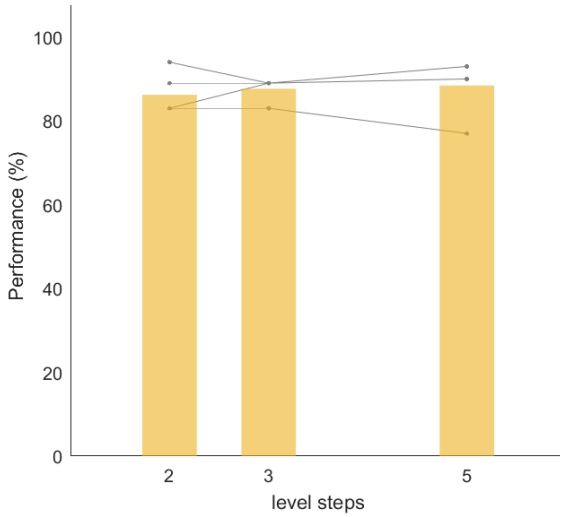



**Figure 2. Performance in unitary choice trials during training**

Subjects learned object values properly regardless of the number of value levels in training blocks. Data from individual subjects is plotted in grey.

To check whether subjects are treating values as mere numeric labels or feel their value, we looked at their reaction times in force trials. We observed that subjects choose higher-valued fractals faster (Figure 3). Although force trials are self-paced and only one option is available to choose, in the second half of each block that participants are aware of object values, reaction times decreased with increasing the object values from zero to 100. In comparison with zero-valued fractals, 100-valued fractals are chosen faster in all sets (Figure 3).

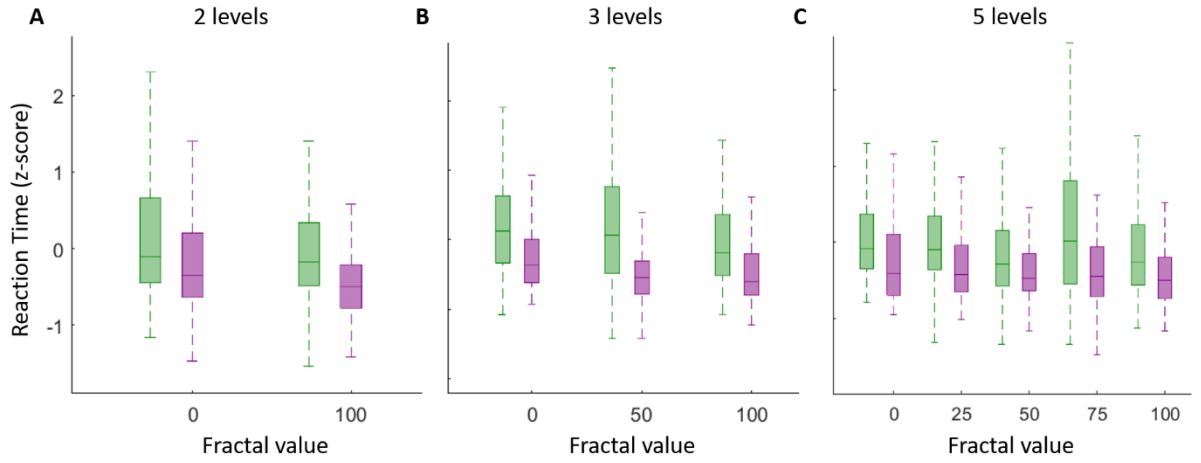



**Figure 3. Reaction times in force trials show signatures of value learning**

Time from fractal onset to key press in force trials in force trials in a set with two (A), three (B), or five (C) value levels. Green box plots correspond to reaction times in the first half of trials in each set and purple box plots correspond to the second half of trials. In the second half of trials (purple), higher-valued objects are chosen faster compared to zero-valued objects confirming effectiveness of the value learning paradigm.

Therefore, participants learned object values equally well in all blocks. However, when measuring value memory through the same unitary choice trials, we noticed that subjects'

performance is significantly lower in objects within the 5-level blocks ((2 level: 84.6%, 3 level: 77.8%, 5 level: 64.2%, $p<0.05$, Figure 4).

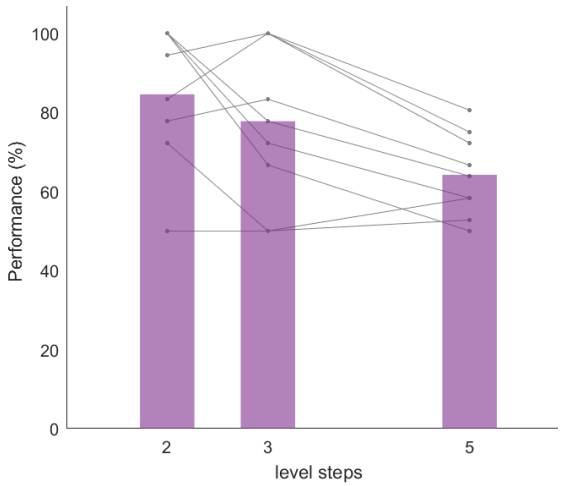



**Figure 4. Performance in unitary choice trials during memory test**

Value recall is affected by the number of value levels in training blocks. Data from individual subjects is plotted in grey.

We observed that the number of value levels in a learning block can affect value recall in humans. To investigate the underlying reasons of this effect, we measured value recall in all objects grouped by their absolute value. As demonstrated in Figure 5, the highest and lowest values are remembered better than intermediate values suggesting that the mechanisms for storing extreme values in memory differ from that for non-extreme values.

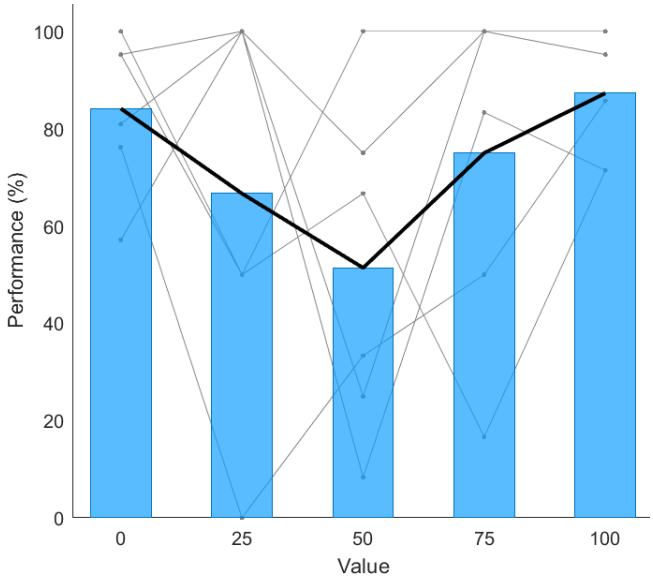



**Figure 5. V-shaped performance in unitary choice trials after one hour**

Average performance in memory test trials grouped by object value. Data from individual subjects is plotted in grey.

The V-shaped performance curve attains its minimum at 50 which is the average of object values in each set and overall. This effect can be studied more rigorously, in future studies.

## Discussion

Humans and animals are motivated to interact with objects that are previously associated with reward. Object value memory is shown to depend on the learning process (Farmani et al., 2024). In this study, we asked whether value recall is affected by the number of value levels during learning. Our results suggested that objects values are remembered less clearly, as the number of value levels increased during learning. By means of psychophysics experiments with human subjects, we found that intermediate and extreme values are not remembered equally well. In fact, memory retrieval is a V-shaped curve. When the number of value levels increase, subjects are required to learn low values and high values as well as the intermediate values. However, in sets with 2 value levels subjects only need to learn low and high values. Weak recall of intermediate values results in lower performance rates in memory test for sets with higher value resolution. This can be improved with enhanced training procedures in future studies. Increasing the number of training trials could help to attain near perfect performance in all object sets.

The V-shaped curve observed in memory performance of object values may indicate that objects with the highest and lowest utilities for participants are less likely to be forgotten than the ones with medium values. This is in line with larger slope of the utility curve at extreme benefits or losses in prospect theory (Kahneman, and Tversky, 2013).

Memory is about storing information for later recall. The way information is encoded affects how well it is remembered later. It has been shown that when encoded through meaningful associations, information is remembered better in long-term. This effect often called *levels of processing*, indicates that if information is encoded on a deeper level, it is more likely to be remembered (Mcleod, 2007), suggesting that in the long-run mere repetition is not sufficient for making an experience, event, or a piece of information memorable.

Memory distortion is commonplace and is extensively observed and studied in humans (Roediger and McDermott, 2000). It has been shown that when remembering past events, humans exaggerate what matters to them most and ignore other details (Holzman and Klein, 1954; Suzuki, 1979). This effect known as *Leveling and Sharpening* is one form of memory distortion first introduced by Allport and Postman (1947). In the present experiment, one can argue that human subjects try to maximize their reward with the least possible effort. During decision making humans need to decide on which objects to approach and which ones to avoid. In this scenario, participants try to memorize high-valued and low-valued objects more accurately. This is consistent with the V-shaped performance of subjects during memory test. Leveraging and Sharpening is argued to depend on humans' personality and self-awareness (Holzman and Klein, 1954). It is not always a negative effect since the ability to capture and store highlights is important.

In the present task, fractals associated with 100 or zero values are the most and the least rewarding objects, respectively. Their extreme values suggest that these objects are the most important ones to memorize. One may argue that higher-valued objects are chosen more frequently during binary choice trials and are therefore better remembered after an hour. If frequency of choices was the reason for different recall rates, one would expect to see a monotonic increasing curve as a function of absolute value instead of a V-shaped relationship. In that scenario, the highest performance rate would occur for 100-valued fractals and the least performance rate would be associated with zero-valued fractals. But, this is not the case. We observed that 100 and zero-valued fractals are remembered equally

well. As object values approach the mean value (50), value memory gets farther from perfect. Hence, objects are encoded with their values and not with the frequency of being chosen.

The 100 and zero values are not only the most salient (attention absorbing) objects but are also the first and last available values overall. It must be noted that when trying to memorize items in a list, humans remember the first and last item better than the other ones. In other words, the *serial position* of ordered pieces of information can affect recall (Ebbinghaus, 1885). Better memory for objects with 100 and zero values could be due to the order of their values. Further investigation is required to confirm or rule out the effect of these memory distorting factors in the present task.

## Conclusion

Object value memory or the history of being associated with reward shapes our interactions with objects. Therefore, the accuracy of remembering object values is of utmost importance to humans and animals. Here, we demonstrated that the resolution of values one confronts during learning, can modulate value memory as a consequence of weak recall of objects with non-extreme values in high resolution contexts. We observed that the magnitude of object values can modulate value memory so the most and the least rewarding objects are perfectly memorized while objects associated with intermediate values are more likely to be forgotten. This may explain for humans idealistic and impulsive behaviors when they have many alternatives to choose from.

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# *Guideline Development of Healthy Brain and Mind Application for Enhancing Cognitive Functions of Adults*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
The purposes of this research were 1) to study healthy brain and mind application (HBM app.) that can enhancing cognitive functions of adult, 2) to study the adults' satisfaction and opinion on HBM app. to develop cognitive functions and being healthy adults. The informants were 20 adults' experimental group who willing to participate in this research project. The data was collected through the satisfaction questionnaire and semi-structured interviews and analyzed by content analysis. The research results revealed that;
1. The HBM application composes 3 parts: Part 1: the general information and defining valued, goals and committed actions ways for being healthy adults based on Acceptance and Commitment Therapy (ACT). Part2: brain health training via 4 activities and mental health training via 3 activities Part3: daily records of healthy lifestyles for 1) physical health via eat good nutrition, sleep well and 30 minutes exercise 2) relationships activities of each day and 3) daily money plaining and expense.
2. The adult's opinion on the HBM applications. The thought that the HBM application could help them for enhancing cognitive function and mental health, including the guideline for taking the committed actions in line with the life values of being healthy adult and being healthy aging after retirement.

Keywords: Healthy Brain and Mind Application, Adults, Acceptance and Commitment Therapy

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## Introduction

The concept of "Healthy Ageing" has replaced the WHO's previous term, "Active Aging," which encompassed three characteristics of older adults: good health, participation, and security (WHO, 2002). The Active Aging Index for Thai elderly individuals consists of four dimensions: health, participation, security, and an enabling environment (National Statistical Office, 2017). Healthy Ageing refers to the process of developing and maintaining functional ability, which contributes to well-being across the life course. Functional ability is the capability to perform various functions, including: 1) meeting basic needs, 2) learning, growing, and making decisions, 3) being mobile, 4) building and maintaining relationships, and 5) contributing to society (WHO, 2018). In Thailand, Healthy Ageing is defined as the state of being an elderly person free from disease, with the ability to engage physical, physiological, mental, and social capacities that change due to the aging process, enabling them to function appropriately. This refers to elderly individuals who have the potential to lead a normal life and contribute to their community and society (Ministry of Public Health, 2018). The assessment of Healthy Ageing in Thailand encompasses: 1) limitations and disabilities in performing basic daily activities, 2) a comprehensive assessment of resources, including common problems and diseases among the elderly (e.g., diabetes, hypertension, cardiovascular disease risk, oral health, vision health), geriatric syndromes (cognitive impairment, depression, knee osteoarthritis, falls, urinary incontinence, nutritional problems, sleep disorders), and functional capacities for self-care, 3) cognitive and functional capacities, and 4) diseases and complaints that impact and burden the elderly. Developing a new generation of robust and self-reliant elderly individuals who are prepared to care for themselves physically, mentally, and socioeconomically is therefore crucial.

Haenjohn et al., (2022) indicated that the local folk handicraft experts, particularly those skilled in traditional weaving, serve as excellent role models for active ageing in the Eastern Economic Corridor (EEC) region. As transmitters of valuable cultural and social knowledge in traditional handicrafts, these elderly experts take pride in their work and experience moderate to high levels of mental well-being and happiness indicators. Research results shown that the local folk handicraft ageing: 1) robust physical health, 2) High cognitive functions due to the focused attention and memory required for weaving intricate patterns, 3) happiness, positive emotions, mental agility, stress relief, and social engagement through group weaving activities, and 4) the ability to earn income and support themselves and their families (Haenjohn, et al., 2022).

The process of developing and maintaining the functional ability that enables wellbeing in older age." Functional ability is about having the capabilities that enable all people to be and do what they have reason to value. Functional ability is about having the capabilities that enable all people to be and do what they have reason to value. Functional ability is the capability to perform various functions, including: 1) meeting basic needs, 2) learning, growing, and making decisions, 3) being mobile, 4) building and maintaining relationships, 5) contributing to society (World Health Organization: WHO, 2020; Chalfont et al., 2022).

The purposes of this research were 1) to study healthy brain and mind application (HBM app.) that can enhancing cognitive functions of adult, 2) to study the adults' satisfaction and opinion on HBM app. to develop cognitive functions and being healthy adults.

The research results revealed that;

1) The Healthy Brain and Mind Application (HBM) is developed for enhancing cognitive functions of adults in EEC based on the integrating research findings across all stages with psychological principles; Acceptance and Commitment Therapy (ACT), Dialectical Behavior Therapy (DBT), Neuro-Linguistic Programming (NLP), and the World Health Organization's Healthy Ageing Concept (WHO,2020). The Healthy Adult Program for the working adults in the Eastern Economic Corridor Zone aims to promote physical health, brain health, mental health, social participation, and financial security to prepare for healthy aging. It comprises learning activities and skill practice across 5 modules: Module 1: Healthy Aging, Module 2: Brain Health, Module 3: Mental Health, Module 4: Relationships and Participation and Module 5: Wealth and Security. Thus, the program consists of 5 practical training sessions to instill values, goals, and practices for well-being in adulthood that lead to healthy aging. Participants then apply these practices to their daily lives for 10 days using the researcher-developed Healthy Brain and Mind (HBM) application, spending 30-50 minutes per day for a total of 15 hours.

2) The program was evaluated by 5 experts in psychology, psychiatry, neuroscience, and gerontology, who found it highly appropriate (Mean = 4, S.D.=0) in terms of objectives, key concepts, materials, duration, activities, evaluation, content, difficulty level, and real-world application (see Figure: 1).

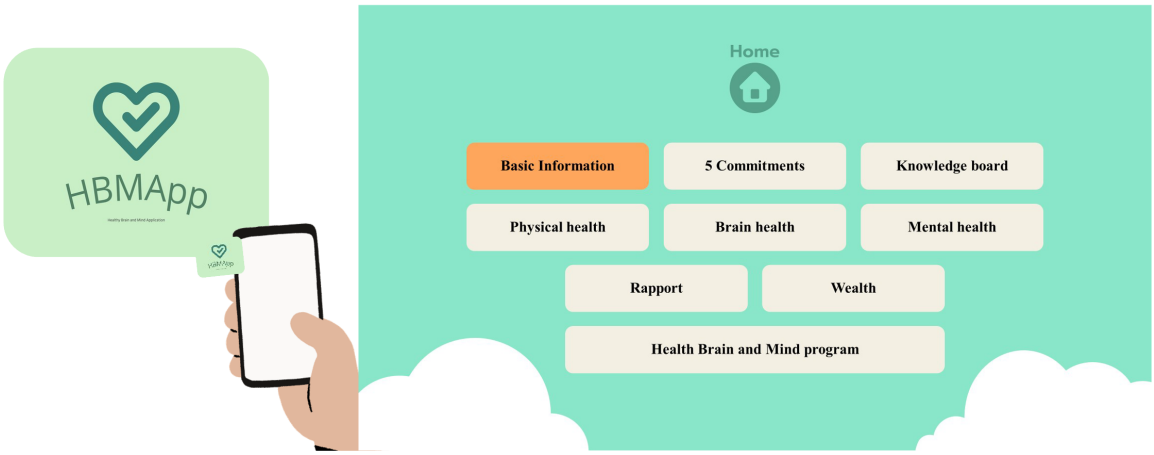



Figure 1: 5 practical training sessions of the HBM application.

Details of the Healthy Adult Program:

1. 5 commitments for healthy ageing: Activities to create values, goals, and define a lifestyle focused on well-being in adulthood.
2. Brain Health: Activities to develop a lifestyle that enhances brain health through various brain stimulation exercises:
    a) Being Present: Choosing between breathing exercises (4,7,8 technique with increasing repetitions from 6 to 30 times) or body scans guided by audio.
    b) Brain Plasticity: Three activities to increase brain flexibility:
        i. Sound Awareness: Listening to bell sounds in 3 rounds and correctly identifying the number of rings (varying in each round).

ii. Cognitive flexibility: Different activities each day, such as naming words starting with specific letters, fruits, animals, red flowers, etc., within 1 minute.
iii. Working memory training: Watching an animation demonstrating a weaving pattern, memorizing the pattern using pegs from level 1 (4 lines) to level 7 (12 lines).

c) Reporting new lifestyle patterns in diet, exercise, and sleep to enhance brain health via the HBM application.

3. Mental Health: Learning about the meaning and principles of life crises, creative problem-solving, psychological flexibility, and commitment strategies based on ACT principles:
   a) Reporting daily emotional awareness and coping strategies via the HBM application.
   b) Practicing self-as-context and cognitive defusion skills through "Let it on Cloud Floating" and "Let it on Leaves in Stream" animations with guided audio.
4. Relationships and Participation: Learning about building and maintaining relationships, social participation, and commitment strategies. Reporting participation choices via the HBM application 10 times.
5. Wealth and Security: Learning about financial planning principles, tax strategies, and strategies for a prosperous retirement. Reporting implementation via the HBM application 10 times.

## Conclusion

After the program, the HBM application was used with 20 working adults in the Eastern Economic Corridor Zone by 6 practical training sessions (50 minutes each) over 1 day to establish values, goals, and practices for a well-being lifestyle aligned with short-term goals (10 days). It emphasizes brain health and mental health skill practice while reporting lifestyle changes in diet, exercise, relationships, and income/ expenses on the HBM application for 30-50 minutes per day over 10 days.

Their satisfaction with the HBM application is summarized below:

1. General Information of number and percentage of participants by gender and training device shows that out of the 20 participants, most were female (70%), and the most commonly used training device was a laptop (55%), followed by Android and iOS smartphones.
2. Satisfaction With the Healthy Brain and Mind Application (HBM)
   2.1 Item-Wise Satisfaction With the HBM Application

| Items | M | S.D. | Satisfaction level |
|---|---|---|---|
| 1.1 Identifying values, goals, and practices for being a healthy adult | 4.60 | 0.598 | Most satisfying |
| 2.1 Proper breathing technique (4,7,8) | 4.65 | 0.587 | Most satisfying |
| 2.6 The HBM app helps promote brain health | 4.55 | 0.605 | Most satisfying |
| 3.2 Identifying emotion management strategies and outcomes | 4.55 | 0.686 | Most satisfying |

| Items | M | S.D. | Satisfaction level |
|---|---|---|---|
| 3.4 Recognizing change through "Let it on Cloud Floating" | 4.55 | 0.605 | Most satisfying |
| 6.1 Consuming brain-boosting and disease-preventing foods | 4.60 | 0.503 | Most satisfying |
| 7. Satisfaction with the 5-hour practical training for the Healthy Adults program | 4.65 | 0.489 | Most satisfying |
| 9. Overall satisfaction with the Healthy Adults program | 4.55 | 0.510 | Most satisfying |

Table 1: Mean and Standard Deviation of Satisfaction Scores for the HBM Application by Item

The table 1 reveals that most items had a high level of satisfaction, with 8 items rated as "highest" satisfaction: (Item 1.1) Identifying values, goals, and practices for being a healthy adult (Item 2.1) Proper breathing technique (4,7,8) (Item 2.6) The HBM app helps promote brain health (Item 3.2) Identifying emotion management strategies and outcomes (Item 3.4) Recognizing change through "Let it on Cloud Floating" (Item 6.1) Consuming brain-boosting and disease-preventing foods (Item 7) Satisfaction with the 5-hour practical training for the Healthy Adults program (Item 9) Overall satisfaction with the Healthy Adults program.

2.2 Satisfaction With the HBM Application by Dimension

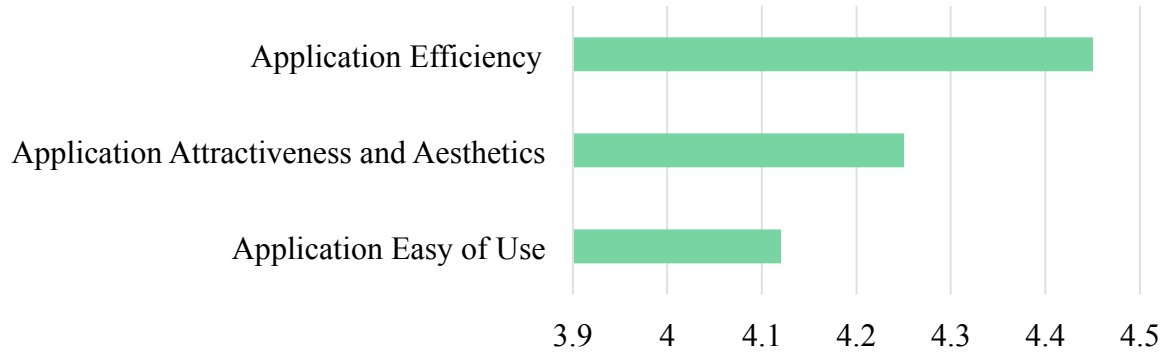



Figure 2: Satisfaction with the HBM Application by Dimension

The Figure 2 shows that the mean satisfaction level was high across all three dimensions, with the highest being "Application Efficiency" (M=4.45, S.D.=0.429), followed by "Application Attractiveness and Aesthetics" (M=4.25, S.D.=0.764), and "Application Ease of Use" (M=4.12, S.D.=0.631).

### 2.3 Comparison of Mean Satisfaction With the HBM Application by Gender and Training Device

| Satisfaction | Gender | | | Type of device | | | |
|---|---|---|---|---|---|---|---|
| | Female | Male | t-test | IOS | Android | Laptop | F-test |
| Application Easy of Use | 4.05 | 4.29 | -.765 (p=.454) | 4.00 | 4.33 | 4.04 | .446 (p=.648) |
| Application Attractiveness and Aesthetics | 4.26 | 4.22 | .104 (p=.919) | 4.22 | 4.39 | 4.19 | .132 (p=877) |
| Application Efficiency | 4.43 | 4.49 | -.300 (p=.768) | 4.46 | 4.36 | 4.49 | .163 (p=.851) |

Table 3: Analysis Results Comparing Mean Satisfaction with the HBM Application by Gender and Training Device

The table 3bindicates that there were no significant differences in satisfaction with the HBM application between males and females or among participants using different training devices.

Strengths and Suggestions from Participants Regarding the HBM Application Training:

*Strengths:*

1. It was an excellent experience to have the opportunity to participate in this activity.
2. This application helped facilitate positive lifestyle changes.
3. This was an excellent training program.

*Suggestions for Improvement:*

1. The application should be optimized for all systems, and answer entry should be straighter forward.
2. The dietary details should be adjusted.
3. Initially, there were some issues with accessing the application, especially on mobile devices.
4. Opportunities for building relationships among participants should be provided.
5. The application should be more modern and incorporate games to enhance motivation.
6. Communication, font size, user-friendliness, and security could be further improved.
7. The system is not yet complete, and accessibility should be improved.
8. The wording of some questions should be clarified and corrected.
9. The program should be extended beyond 10 days to observe more apparent results.
10. More time should be allocated for the memory exercises.
11. The ability to record historical data would be beneficial.

This article presents feedback and key takeaways from participants of a healthy adults training program that focuses on improving cognitive abilities, emotional regulation, and overall well-being through lifestyle changes.

Woman, Age 42 gave feedback for the key benefits gained as follows;

> *"Practiced executive functions of the brain, especially for the memory enhancement."*
>
> *"It helped me to develop physical strength and fitness and I have learned emotional management for daily life, Including, placed greater importance on self-care through proper nutrition."*

Man, Age 48 gave feedback for the key benefits gained as follows;

> *"Practiced concentration through breathing exercises."*
>
> *"Learned to plan and manage daily life with discipline."*
>
> *"Practiced focus and prioritization of life activities."*
>
> *"Nurtured cognitive health through diet, exercise, and proper sleep."*
>
> *"Continuously trained to improve memory."*
>
> *"Suggestion: Develop a more stable app to better facilitate cognitive training."*

In can be concluded the HBM program might be help participants to enhance their cognitive, mind and health that contribute them to be healthy through their life even in old age.

## Acknowledgment

This work was financially supported by (i) Burapha University (BUU), (ii) Thailand Science Research and Innovation (TSRI), and (iii) National Science Research and Innovation Fund (NSRF) (Fundamental Fund: Grant no. 13.5/2566).

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# *Crafting Emotional Authenticity: A Design Thinking Approach to Developing a Practical Deep Acting Tool for Emotional Labor*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
This paper presents a pioneering application of Design Thinking principles to create a tangible Emotional Labor toolkit, focusing on deep acting as a sustainable emotion regulation strategy in professional contexts. Surface acting, prevalent in Emotional Labor, can lead to burnout and undermine well-being. Drawing from Design Thinking's human-centric approach to creative problem-solving, the toolkit harnesses three key facets - Empathy, Definition, and Ideation - to foster Empathy, Awareness, and Cognitive Reappraisal in deep acting emotion regulation. Incorporating insights from literature on emotion authenticity and regulation, the toolkit underwent iterative prototyping and testing, including two rounds of pre-pilot playtesting with smaller groups for refinement. The pilot toolkit, designed for experiential learning, involved 20 participants in a play test simulating diverse life scenarios across various age groups. Tasks involved demonstrating empathy in challenging situations and utilizing cognitive reappraisal with emotional vocabulary as tools. Data collection via observation and thematic analysis assessed Empathy Expression, Cognitive Reappraisal Effectiveness, and Affect Labels Expansion (Awareness). A post-play survey measured participant experiences, confidence, and growth in these domains. This study offers a comprehensive account of toolkit development, refinement, and validation, with the aim of providing the industry with a practical and accessible resource for emotional labor.

Keywords: Design Thinking, Emotional Labour, Emotional Authenticity, Organisational Development, Organisational Well-being, Deep-acting, Emotional Regulation

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## Introduction

### *The Problem With Emotional Labour*

Emotions play a significant role in shaping organizational behavior and workplace culture. Certain professions mandate the display of solely positive emotions, while in others, employees are expected to suppress all emotions, viewing emotional expression as contrary to rationality in the workplace (Raz, 2002; Barsade and Gibson, 2007). Hochschild (1983) defines Emotional Labor as the effort, skill, and regulation of emotions required to perform a job in exchange for compensation. This entails expressing appropriate emotions, suppressing inappropriate ones, and projecting a desired emotional demeanor, often regardless of one's genuine feelings (Van Kleef & Fischer, 2016).

According to Grandey and Gabriel (2015), Emotional Labor is a threefold process: emotional requirement, emotional regulation, and emotional performance. Emotion requirement dictates the necessary emotional expression for the job; Emotion regulation involves modifying feelings or expressions to exhibit positive emotions and conceal negative ones; Emotion Performance entails observable expressions consistent with job requirements (Grandey and Gabriel, 2015).

In numerous professions, such as customer service, nursing, teaching, and hospitality, emotional labor is integral to job performance. For instance, flight attendants must maintain composure in stressful situations, nurses convey empathy to patients, and teachers foster a positive classroom atmosphere regardless of their personal feelings. Many organizations train their employees to adhere to scripted behavioral norms, termed 'surface acting' (Menon & Dubt, 1999), which disconnects them from their genuine emotions. Emotional labor that suppresses authenticity has been identified as a primary cause of workplace burnout and disengagement, negatively impacting personal well-being (Schmid, 2005; Wyatt, 2001; Dhanpat, 2016; Metin et al., 2016; Cable and Kay, 2012).

### *The Need for a Deep-Acting Tool for Emotional Labour*

In a survey conducted by Intellect, a mental healthcare technology company in Asia Pacific, in collaboration with Milieu Insight, a Southeast Asian research firm, 150 human resource professionals in Singapore were polled. The findings revealed that 75% of respondents reported experiencing regular feelings of burnout at work. Despite the widespread availability of mental healthcare resources, only 32% believed that their companies genuinely valued mental health (Intellect, 2023).

Similarly, a study conducted in Asia by Aon and Telus, as part of the Asia Mental Health Index Report 2023 (Aon, 2023), surveyed 13,000 individuals across the region. The results indicated that 47% of respondents felt mentally or physically exhausted by the end of each workday. Additionally, 45% reported that burnout negatively affected their productivity, and 54% expressed concerns that their career development would be impacted if their employers were aware of their mental health issues.

These findings underscore the significant impact on well-being when individuals encounter challenges in communicating stressors and maintaining emotional authenticity in the workplace.

Similar to the concept of emotional authenticity (Keltner & Haidt, 2001; Gross, 1998) is the notion of genuine emotional labor (Diefendorff et al., 2005). This represents the most desirable form of emotional labor, where there is no need for acting or emotion regulation; the displayed emotion aligns naturally with the individual's true feelings and the emotional display requirements of the job. Genuine emotional labor is often achieved through 'deep acting' (Hochschild, 1983), wherein individuals adjust their internal emotional state to match the expected emotional display for the job. Unlike surface acting, which involves simply faking emotions, deep acting entails genuinely experiencing the emotions one is expected to express (Fredrickson, 2001; Richins, 1997; Gross, et al., 1997). However, achieving deep acting is inherently more challenging due to its abstract and less tangible nature compared to surface acting. Therefore, the development of a tangible tool to facilitate deep acting for genuine emotional labor becomes essential.

Roger (1959) proposed that authenticity is an intrinsic aspect of human nature, although its actualization depends on a supportive social context characterized by empathy, the ability to maintain positivity, and a secure environment conducive to congruence. Emotion regulation (Gross, 1998; Gratz & Roemer, 2004; King & Hicks, 2007; Lane et al., 1990) involves various techniques, including awareness (Teper, Segal & Inzlicht, 2013), perspective-taking to foster empathy (Batson, 1991; Davis, 1983; Decety & Jackson, 2006; Hodges & Biswas-Diener, 2007), and cognitive reappraisal (Gross, 1998; Ochsner & Gross, 2005), all aimed at facilitating genuine and effective emotion regulation.

The insights for the development of a deep-acting tool that necessitate organisational well-being can be summed up as:

1. It must replicate the conditions of a nurturing social environment conducive to fostering emotional authenticity.
2. It should integrate elements of perspective-taking, awareness and cognitive reappraisal to cultivate deep-acting capabilities.

We translated the insights from the literature review to criteria that inform us on what the toolkit must encompass in Figure 1.

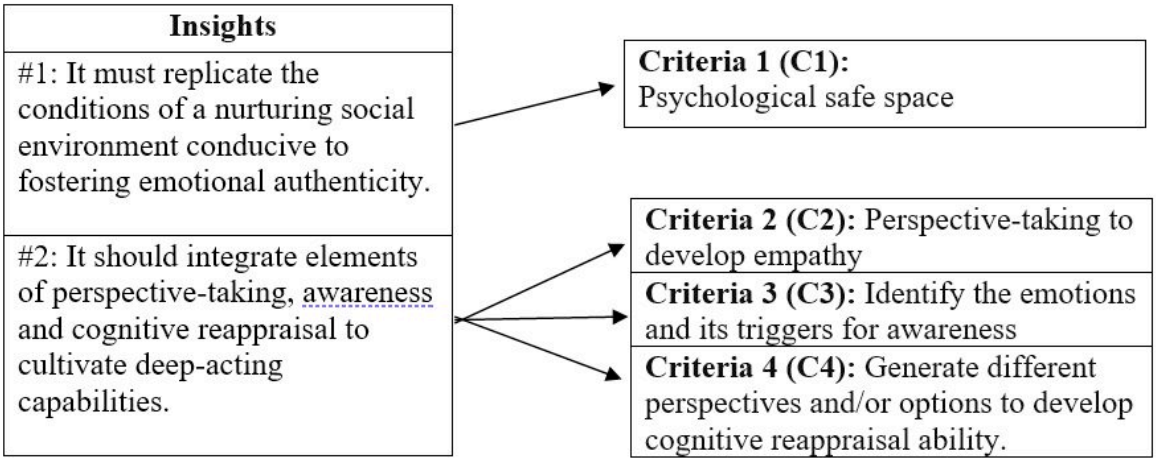



Figure 1: Mapping insights from Literature Review to inform criteria for deep-acting tool development

Insights #1 underscores the significance of psychological safety (Edmondson, 1999), characterized by an environment where individuals can freely express themselves without apprehension of reprisal. This atmosphere nurtures trust and openness, pivotal for genuine emotional expression. When individuals perceive psychological safety, they are inclined to disclose their authentic emotions (Kahn, 1990).

Insights #2 underscores the importance of integrating perspective-taking, awareness, and cognitive reappraisal to enhance deep-acting capabilities. Firstly, fostering perspective-taking enables individuals to comprehend others' viewpoints and emotions, thereby promoting empathy development and enhancing emotional understanding and connection with others (Decety & Jackson, 2006). Secondly, awareness involves identifying emotions and triggers, enabling individuals to recognize their own emotions and the situational cues that influence them (Gross, 1998). This self-awareness facilitates effective emotional regulation, leading to greater emotional authenticity and regulation abilities. Lastly, cognitive reappraisal involves reframing thoughts to generate alternative perspectives and options, thereby modifying emotional reactions (Ochsner & Gross, 2005). By exploring different interpretations of situations, individuals can challenge and adjust their emotional responses, fostering adaptive coping and resilience (Gross, 1998). This comprehensive approach cultivates deep-acting capabilities crucial for authentic emotion regulation, consistent with the principles of deep-acting.

## Problem-Solving Frameworks

### *Leveraging Design Thinking as a Problem-Solving Framework*

Design Thinking, celebrated for its human-centric problem-solving approach (Foster, 2019), presents an auspicious framework for designing a toolkit aimed at addressing issues surrounding emotional labor. With its robust methodology tailored for human-centered challenges, Design Thinking offers a dynamic framework adept at crafting solutions that deeply resonate with the needs and experiences of end-users (Brown, 2008). At its essence, Design Thinking commences with empathy, enabling designers to immerse themselves in the lived experiences of those they aim to design for (Kelley & Kelley, 2013). Adopting an iterative process, Design Thinking emphasizes collaboration between designers and users to frame problems and develop early concepts (Kim & Ryu, 2014). This iterative approach facilitates rapid prototyping and testing for continuous improvement, ensuring that solutions are responsive to human-centric insights (Kelley & Kelley, 2013).

By comprehensively understanding users' perspectives, motivations, and pain points, designers can acquire valuable insights that inform the entire problem-solving process. A pivotal strength of design thinking is its focus on divergent thinking, which encourages teams to explore a broad spectrum of possibilities, thereby generating innovative ideas that may not have been initially apparent (Brown, 2008).

By harnessing the principles of design thinking, organizations can cultivate solutions that not only align with technical feasibility but also deeply resonate with the individuals they aim to serve (Brown, 2008). As we grapple with the intricacies of deep-acting to aid emotional laborers in regulating their emotions authentically, the application of design thinking holds the potential to instigate meaningful and sustainable changes for the enhancement of organizational well-being.

Recognizing the potency and aptness of design thinking in addressing this challenge, the team further utilizes the "How Might We" method. This approach is commonly employed to formulate a design challenge (Siemon, Becker & Robra-Bissantz, 2018), encapsulated in the question:

> *"How might design thinking enable emotional authenticity and aide deep acting emotion regulation at workplace safely and effectively?"*

As we collaborated to explore and address the problem, guided by the non-linear and iterative process of design thinking, we discovered that three of the five design thinking phases (Plattner, Meinel, and Leifer, 2012) – Empathy, Definition, and Ideation – align with the criteria essential for the deep-acting tool. These phases could potentially be leveraged in the design of the toolkit. We formulated three hypotheses to be tested, as outlined in Table 1:

H1: Leveraging on 'empathy' process can create a psychological safe space for people to 'open up' (emotion authenticity to take place).

H2: Leveraging on "Definition" process can help users develop awareness through identifying the emotions that were being triggered in different situations.

H3: Leveraging on 'ideation' process to generate cognitive reappraisal as a form of emotion regulation strategy.

| **Design Thinking Phases** | **What it does** | **Potential fulfilment to criteria** | **Hypothesis** |
|---|---|---|---|
| Empathy | Perspective taking to understand individual's experiences. | Perspective-taking to generate empathy (C2) that helps create a psychological safe space (C1), for people to share their experiences (Banker & Bhal, 2020) | Leveraging on 'empathy' process can create a psychological safe space for people to 'open up' (emotion authenticity to take place). |
| Definition | Identifying the core problem to be addressed | Awareness (C3) of emotions is the first step to emotional intelligence including regulation (Goleman, 2005). | Leveraging on "Definition" process can help users develop awareness through identifying the emotions that were being triggered in different situations. |

| | | | |
|---|---|---|---|
| Ideation | Creating multiple possibilities of potential solutions. | Generate different ideas or perspectives that helps develop cognitive re-appraisal (C4). Cognitive re-appraisal is the ability to see the situations differently which is an important aspect of emotion regulation (McRae, K. et al., 2012) | Leveraging on 'ideation' process to generate cognitive reappraisal as a form of emotion regulation strategy. |
| Prototyping | Building a model according to the selected idea. | Not applicable. | Nil. |
| Testing | Putting the prototype to test. | Not applicable. | Nil. |

Table 1: Mapping Design Thinking Phases to the criteria required and generated hypotheses

***Benefits of Gamification***

As we came together to brainstorm ideas for the toolkit, we explored many different options, such as a training manual, an activity book, workshops, games, and many other ideas.

Gamification was chosen as the optimal strategy for prototype development because of its notable ability to establish a safe and nurturing environment for individuals to explore and express their emotions (Deterding et al., 2011). Through gaming, individuals can engage in emotional authenticity without fear of judgment or consequence (Bowman & Tamborini, 2015). Additionally, gamification facilitates experiential learning, enabling participants to gain insights into others' perspectives and experiences (Landers & Callan, 2014). In the immersive gaming environment, players can experiment with various emotional responses and identities, thereby promoting cognitive reappraisal. Through interactive scenarios and role-playing, participants can deepen their understanding of complex emotions and improve their communication skills for challenging conversations.

Moreover, gamification encourages active involvement and collaboration, fostering a sense of community and shared purpose among participants (Hamari et al., 2014). By incorporating elements like competition, rewards, and interactivity, gamification provides an engaging framework for navigating sensitive emotional topics and promoting constructive dialogue in a lighthearted manner (Deterding et al., 2011). The freedom to authentically express emotions within a supportive gaming environment can cultivate empathy and awareness (Kowert et al., 2014), ultimately facilitating deep-acting for genuine emotional labor. Therefore, gamification satisfies all criteria, from C1 to C4, for the development of a deep-acting toolkit.

**Concept Development**

Based on the established criteria, hypotheses, and the concept of gamification, the designers at Chemistry Team Singapore developed a board game that mirrors the complexities of adult life, filled with aspirations yet burdened by emotional challenges. The game's objective is for

players to attain numerous milestones while shedding emotional burdens baggage through demonstrations of empathy, awareness, and cognitive dexterity to reappraise situations. The ultimate victor is determined by the accumulation of milestones and the minimal retention of emotional baggage. To achieve this goal, the designers created a game board that replicates diverse life paths, along with a comprehensive game kit comprising a set of emotion cards, milestone cards, and challenging situation cards, each depicting various real-life contexts (refer to Appendix A-1 to A-3 for the list of cards).

In the game, each player begins with 7 emotion cards, representing their emotional baggage. Players take turns rolling two dice to determine the number of steps they move. Landing on a space may require them to undertake one of the following challenges:

- Blank space which represents no action required.
- In the Empathy challenge, players draw a situation card and must demonstrate empathy by identifying up to two emotion cards that describe the emotions in that scenario. Successfully completing the challenge allows players to discard emotion cards.
- During an 'Ideate' challenge, one player acts as the host while others pitch solutions by playing an emotion card from their hand. The host selects the winning solution, and the winner discards the used emotion card. Failure to complete challenges results in drawing two additional emotion cards.
- Landing on “Milestone” requires player to draw milestone card. Depending on the level of achievement, players can draw between 1 to 5 additional Emotion Cards, representing the emotional baggage that was accumulated in arriving to a Milestone.

Throughout both ‘Empathy’ and ‘Ideate’ challenges, players identify emotions in challenging situations by playing emotion cards, fostering awareness of emotions. These mechanics align with the three phases of design thinking: empathy (understanding challenging situations), definition (identifying emotions), and ideate (generating solutions).

During the development of the board game, the team conducted two rounds of online focus group studies. Each study involved 4 players who shared their gameplay experiences to refine various aspects of the game, including the clarity of instructions, engagement mechanisms, cards content and the establishment of psychological safety (refer to Appendix B for the Study Equipment – First Prototype of Board Game and Cards Design). As a result of the focus group study, a sand-timer was introduced into the first prototype to control the time for better engagement and “skip” cards were implemented to allow players to skip a round of sharing if they find themselves feeling too vulnerable with the situation thus providing some psychological blanket for the participants.

## Research Methodology

Qualitative scenario-based research was conducted using the board game during an event showcase at Singapore Design Week 2022. The scenarios for the research were replicated by the situation cards in the board game. Publicity and participant recruitment, targeting individuals aged 21 and above, were carried out via social media and the festival's website one month prior to the event, in collaboration with the Singapore Design Council.

Ten volunteer facilitators from the International Association of Facilitators (IAF) Singapore were enlisted to facilitate the board game. They familiarized themselves with the game rules by playing and experiencing the board game before the event. Participants were randomly

assigned to five game tables, each table led by two facilitators – one main facilitator overseeing gameplay and the other serving as a research assistant, observing and recording notes during the session.

A maximum of 30 participants were accommodated for the research, with 20 individuals ultimately participating in the game session. The player profile comprised 6 males and 14 females, aged between 25 and 60 years, representing various nationalities and ethnicities residing in Singapore. Voice recordings of the 60-minute gameplay sessions were collected for Interpretative Phenomenological Analysis (IPA). These recordings were transcribed, coded, and subjected to thematic analysis by two researchers independently. The findings were then compared with data from a post-play survey completed by 17 participants. The reliability and consistency of the analysis were further verified through cross-referencing with facilitators' observations.

## Conclusions

### *Findings*

Using the transcripts from the voice recording, a word cloud validated conversations surrounded a board game about emotions. Key words like "emotion," "situation", "milestone" prominently featured and highlighted the core theme of the board game and indicated that participants were participating in the board game.

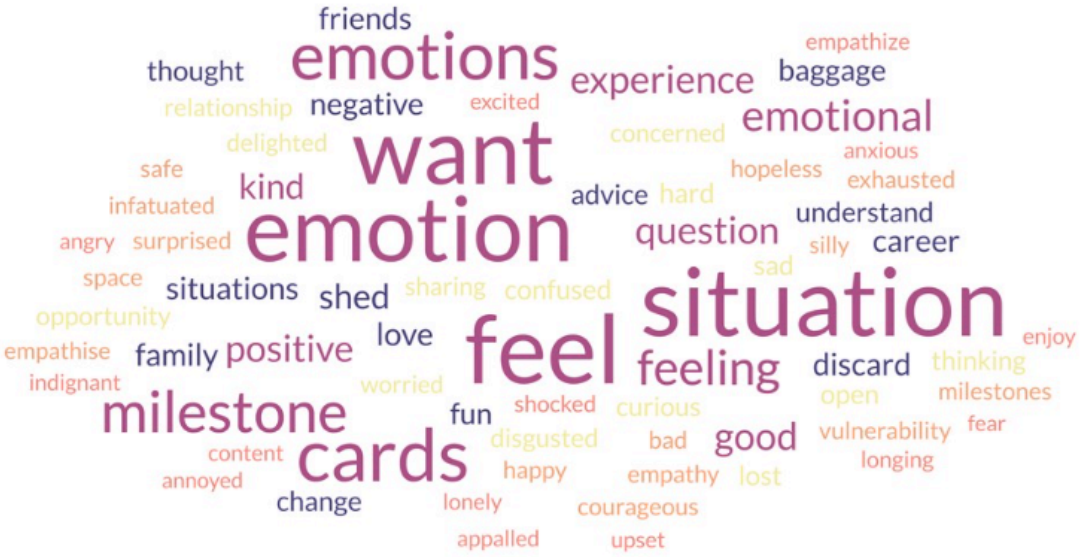



Figure 2: Word cloud generated from the voice recording transcribed by Adobe Priemer Pro

### *H1: Leveraging on 'Empathy' Process Can Create a Psychological Safe Space for People to 'Open Up' (Emotion Authenticity to Take Place)*

Participants showed a general interest in both sharing their own experiences and listening to others, indicating that the game environment fostered a conducive and psychologically safe space for authentic emotional expression. Notably, players appeared more relaxed when facilitators emphasized at the outset that the game was a judgment-free environment, encouraging participants to share without fear of criticism. When participants were encouraged to be "as authentic as they were comfortable," rather than feeling pressured to

demonstrate authenticity, they seemed more inclined to share genuine experiences. Conversely, when authenticity was enforced, some participants exhibited discomfort and questioned the degree of authenticity expected, which hindered their willingness to share.

When prompted as part of the game challenges to demonstrate empathy towards challenging situations, participants generally exhibited empathetic behavior. However, there were instances where younger participants found it challenging to empathize with situations commonly encountered by older participants, such as experiencing a mid-life crisis or harboring fears of being replaced by technology.

Some quotes from the participants that demonstrated the game provides a safe space are:

> “It could be played with anyone and encourage people to be more human.”
>
> “It was fun and it helps us understand one another better.”
>
> “I think is a very interesting game and there's not many games in this kind of topics or subjects. So yeah, I think it will be quite interesting to actually play with a close friend for a start.”

This finding was corroborated by 13 out of 17 respondents to the post-game survey who answered "yes" to the question: "Do you think this tool helps you empathize with others better?" However, among the 23.5% who responded "no" to the question, feedback indicated that some participants found the game environment to be "a bit artificial."

9 out of 17 respondents to the post-game survey expressed interest in playing the game with their workmates, while the remaining respondents did not share the same enthusiasm. Reasons provided by participants for their interest in playing the game with their workmates included:

> “It hopefully helps to build bonds.”
>
> “…I would want to play this game with someone I am pissed off with, so we can see each other’s perspectives on the issues”
>
> “To learn their emotions/emotional behaviour during different professional situations and share mine. However, the game situations need to be more of a professional setting.”

For those who do not want to play the game with their workmates, the reasons are:

> “Don’t want workmates to be too personal with me.”
>
> “Don’t see how it can help with the relationship with my colleagues.”
>
> “If my colleague happens to be my supervisor, I will feel uncomfortable.”
>
> “I'm not sure about playing with colleagues yet though. Like just now a few of the questions that we took for work right, because I’m not very close to my colleague or if there’s already a very tricky situation at work, I’m not sure whether it would be it

> would add fuel to the fire at that point in time, even though it's just a casual game already."

Some participants remarked that they would feel more comfortable playing with strangers rather than with people they know, as they perceive it as safer to authentically share their experiences with strangers without fearing offense. Additionally, 58.8% of respondents indicated in the post-game survey that they believe this tool can enhance teams' communication about emotional and challenging situations. These insights raise doubts about the suitability of deploying the toolkit in the workplace to address emotional labor in organizations.

***H2: Leveraging on "Definition" Process Can Help Users Develop Awareness Through Identifying the Emotions That Were Being Triggered in Different Situations***

At the beginning of the game, participants were each dealt 7 emotion cards, which they could either accumulate or discard throughout the game. Given that the game's objective is to have the most milestones and the fewest emotion cards, participants were observed to play creatively to "discard" their emotion cards rather than authentically engage with the situations. While this outcome may seem contradictory to fostering emotional authenticity, it prompted participants to engage in cognitive reappraisal of the situations, influenced by the cards they held.

> "I would say there's a lot of potential for this. I'm definitely feeling a lot of people are looking for ways to express themselves and this one definitely provide an experience, especially because it's more fun, but at the same time because it's emotions and is gamified, sometimes you might feel a little superficial. Like it disconnect within self and personal experience like this one, and also like I'm trying to convince the other person, Oh, this emotion is what feeds this situation. So, yeah, do I be real or do I just trying to have fun."

It was observed that the lack of emotional words to describe feelings in certain scenarios brought on some frustrations for the participants:

> "I am annoyed…when I don't have the emotional word to describe my emotions in the situation."

> "Don't understand some of the (emotion) words and its meaning."

This observation aligns with affect labeling ability as one of the emotion regulation strategies. Research suggests that individuals who struggle to label their emotions tend to have poorer emotional regulation abilities (Gratz & Roemer, 2004; Lieberman, 2011).

In the post-game survey, 10 out of 17 respondents indicated that the tool helped them identify their emotions better, while 9 out of 17 respondents felt that the tool helped them express their emotions more confidently.

### *H3: Leveraging on 'Ideation' Process to Generate Cognitive Reappraisal as a Form of Emotion Regulation Strategy*

This challenge emerged as the most engaging for participants, as they competed to generate innovative solutions to the challenging situations. Creativity plays a significant role in cognitive reappraisal, as highlighted in research by Beaty et al. (2016). Moreover, the ideation process facilitated the expansion of perspective-taking, as reflected in quotes from the participants:

> "The understanding that there are different emotions to every situation, help to empathise with others better and see a solve a situation with different emotional approach."

> "It opens my perspectives. It didn't occur to me that others may feel differently over the same situation."

In the post-game survey, 14 out of 17 respondents (82.4%) provided positive responses when asked if the tool helped them become more creative with emotions, particularly in leveraging emotions to overcome challenges when feeling stuck.

### *Interpretative Phenomenological Analysis (IPA)*

During gameplay, participants engaged in discussions spanning various topics, from specific challenging scenarios to game design and mechanics. Consequently, the voice recording transcript encompasses a broad spectrum of data across different areas. For this research, our focus is on addressing the overarching research question: "How might design thinking enable emotional authenticity and aid deep-acting emotion regulation in the workplace safely and effectively?" We specifically sifted through the data to extract information related to the three hypotheses while filtering out discussions regarding board game design and technical mechanics. However, conducting a further analysis of the feedback on game design and mechanics data may yield additional insights that could complement the thematic discoveries from this IPA study.

The hierarchy of themes uncovered are depicted in the Figure 3 below:

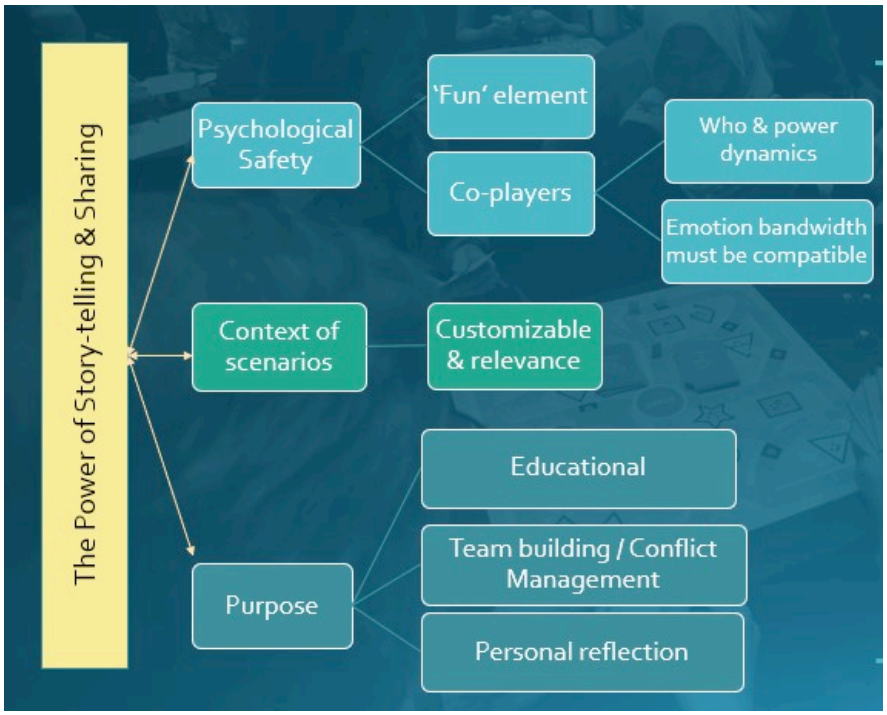



Figure 3: Hierarchy of themes uncovered from IPA

Three primary themes emerged regarding the gamification aspect of a tool aimed at fostering deep-acting abilities: Psychological Safety, Contextual Scenarios, and Game Purpose.

Psychological safety remains a significant concern for the participants, with the term "fun" frequently mentioned when expressing comfort and engagement with the game. Fun activities often foster trust and contribute to a culture where individuals feel valued and accepted. Therefore, enhancing the fun element in the game could promote a more positive and supportive atmosphere, encouraging participants to feel more at ease expressing themselves (Edmondson, 1999). Concerns were also raised regarding the identities of co-players, particularly in the context of playing with workmates. Participants expressed apprehensions about how power dynamics within the playing group could influence emotional authenticity and participation. Further examination of how the dynamics and relationships between players impact the effectiveness of this toolkit is warranted.

In addition to power dynamics, concerns were raised regarding disparities in life experiences and emotional bandwidth among players. Emotional bandwidth encompasses an individual's capacity to effectively experience, understand, and manage a diverse range of emotions (Davis, 1983). It includes the ability to recognize and regulate one's own emotions, as well as empathize with the emotions of others. A broader emotional bandwidth enables individuals to navigate complex emotional situations, demonstrating flexibility in their emotional responses (Richins, 1997). When players with differing emotional bandwidths are grouped together, it may impact psychological safety and hinder emotional authenticity.

In gamifying the toolkit for empathy development, it's essential to contextualize scenarios within common experiences that all players can relate to. Research indicates that some scenarios may feel too distant for certain players to empathize with effectively. By anchoring scenarios in familiar situations, game designers can ensure that players from diverse backgrounds can connect with the emotions and perspectives portrayed within the game (Yannakakis & Hallam, 2006). This approach enhances the effectiveness of empathy-

building games by fostering deeper emotional engagement and facilitating broader empathy development across player demographics.

It is imperative for the toolkit to ensure that players engage with a clear sense of purpose. Participants' suggestions frequently center around three main areas: Education, Team Building or Conflict Management, and Personal Reflection. Whether the aim is to acquire new skills, promote teamwork, or address conflicts, aligning the game's purpose with participants' objectives enhances motivation and engagement (Hamari et al., 2014). By offering clear objectives and meaningful challenges, gamification initiatives can encourage active participation and foster positive outcomes across educational settings and workplace environments.

An overarching theme emerged regarding enhancing psychological safety, contextualization, and purpose: Storytelling. Storytelling fosters psychological safety by providing a platform for individuals to express themselves authentically and share personal experiences without fear of judgment (Edmondson, 1999). Contextualizing challenges through storytelling narratives that resonate with participants can facilitate empathy and connection (Yannakakis & Hallam, 2006). Additionally, storytelling imbues purpose by weaving meaningful narratives that inspire reflection, learning, or action (Brown, 2008). By enhancing psychological safety, contextual relevance, and purpose, storytelling enriches the overall experience and impact of the toolkit.

## Limitations

While the research findings provide valuable insights into the effectiveness of leveraging design thinking for a deep-acting tool in the form of a board game, it's important to acknowledge certain limitations that may affect the generalizability of the results. Firstly, the small sample size raises concerns about the representativeness of the findings and limits the ability to draw broader conclusions. Additionally, the participants who voluntarily signed up for the event and research may inherently possess a more positive disposition towards gamification, potentially biasing the sample towards favorable outcomes. Their enthusiasm and willingness to engage may skew the results towards a more positive perception of effectiveness. Therefore, caution should be exercised when extrapolating these findings to broader populations or contexts, as they may not accurately reflect the attitudes and experiences of individuals less inclined towards emotional authenticity in a gamified context.

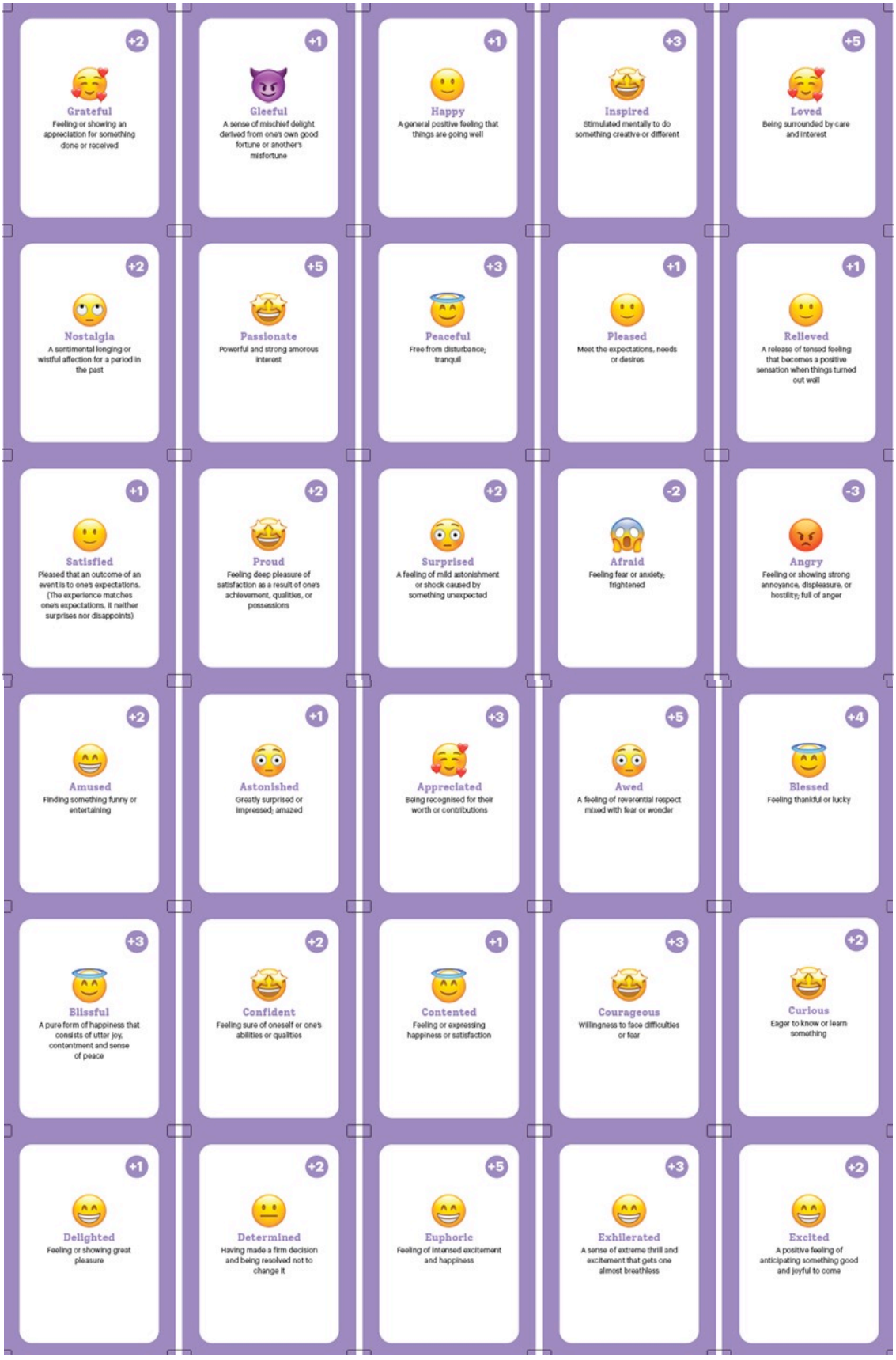
## Recommendations

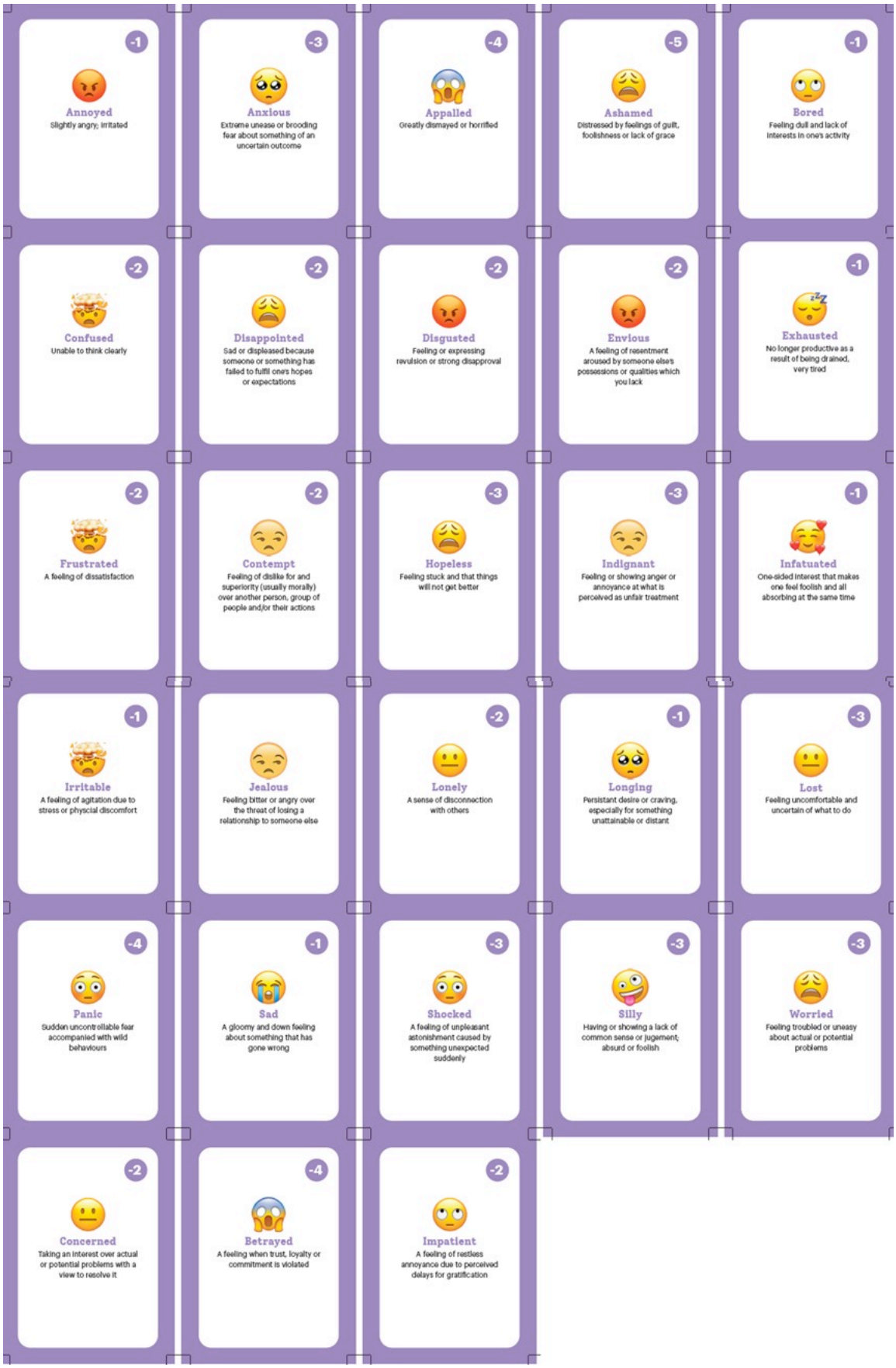
True to the iterative nature of design thinking, the next steps involve leveraging the research outcomes to inform a new iteration of gamification design, with a particular emphasis on incorporating storytelling elements. By infusing narratives into the gamification process, designers can enhance engagement, emotional resonance, and overall effectiveness. Furthermore, it is imperative to conduct further research using larger and more diverse samples. This expanded research approach will allow for a more comprehensive validation of the findings and provide a deeper understanding of how gamification impacts individuals with varying levels of familiarity and enthusiasm towards the concept. By embracing this iterative and inclusive approach, designers can refine and optimize gamification strategies to better meet the needs and preferences of diverse user groups, ultimately enhancing the potential for meaningful and sustainable impact of a deep-acting tool.

## Acknowledgements

We thank the following organisation and individuals for their support and assistance in this study - Dr Koh for critically reviewing and editing the paper. Mr. Loke for leading the design of the study equipment with his peers (Aimee and Videa) from Chemistry Team and Ms Suteja for providing research support on the transcript and coding of recorded data. We thank National Design Council for providing the event and venue for the study to take place and International Association of Facilitators (Singapore) for supporting the study with their facilitators, specifically Qing Ping, Melody, Edwin, Earn Meng, Dawn, Yuan Ting, Neha, Hwee Hoon, Thomas and Cliff.

## Appendix A-1: List of Emotion Cards




-1
Annoyed
Slightly angry; irritated
-3
Anxious
Extreme unease or brooding fear about something of an uncertain outcome
-4
Appalled
Greatly dismayed or horrified
-5
Ashamed
Distressed by feelings of guilt, foolishness or lack of grace
-1
Bored
Feeling dull and lack of interests in one's activity
-2
Confused
Unable to think clearly
-2
Disappointed
Sad or displeased because someone or something has failed to fulfil one's hopes or expectations
-2
Disgusted
Feeling or expressing revulsion or strong disapproval
-2
Envious
A feeling of resentment aroused by someone else's possessions or qualities which you lack
-1
Exhausted
No longer productive as a result of being drained, very tired
-2
Frustrated
A feeling of dissatisfaction
-2
Contempt
Feeling of dislike for and superiority (usually morally) over another person, group of people and/or their actions
-3
Hopeless
Feeling stuck and that things will not get better
-3
Indignant
Feeling or showing anger or annoyance at what is perceived as unfair treatment
-1
Infatuated
One-sided interest that makes one feel foolish and all absorbing at the same time
-1
Irritable
A feeling of agitation due to stress or physcial discomfort
Jealous
Feeling bitter or angry over the threat of losing a relationship to someone else
-2
Lonely
A sense of disconnection with others
-1
Longing
Persistant desire or craving, especially for something unattainable or distant
-3
Lost
Feeling uncomfortable and uncertain of what to do
-4
Panic
Sudden uncontrollable fear accompanied with wild behaviours
-1
Sad
A gloomy and down feeling about something that has gone wrong
-3
Shocked
A feeling of unpleasant astonishment caused by something unexpected suddenly
-3
Silly
Having or showing a lack of common sense or jugement; absurd or foolish
-3
Worried
Feeling troubled or uneasy about actual or potential problems
-2
Concerned
Taking an interest over actual or potential problems with a view to resolve it
-4
Betrayed
A feeling when trust, loyalty or commitment is violated
-2
Impatient
A feeling of restless annoyance due to perceived delays for gratification

## Appendix A-2: List of Milestone Cards

| Milestones | Description in the card |
|---|---|
| Got my driving liscense | Beep Beep! The roads will never be safe again |
| Started Dating | Love is in the air! It's time to find your life long partner. |
| Got My Masters Degree | You took a risk to go back and study and it has totally paid off! The only way is up! |
| Got my PhD | Congratulations on becomeing a Doctor, we just won't come to you when we are sick. |
| Hired by my dream company | Dreams really do come true, and hard work really does pay off! |
| Promoted to Manager | Through the blood, sweat and tears, your hard wark has paid off. |
| Promoted to Director | You've sacrifised a lot to get here, but the hard work doesn't stop now, keep going! |
| Promoted to Team Leader | You're a natural team leader, not just good at your job, but you also know how to inspire others to do their job better. |
| Promoted to Regional Director | You've sacrifised a lot to get here, but the hard work doesn't stop now, keep going! |
| Head-hunted to a new job | You are in demand! It feels good to be wanted, doesn't it? |
| Made CEO | Everyone dreams of being their own boss, but not many become CEO of a huge organisation. Congratulations! |
| First Car | Total freedom has arrived! It's time to explore. |
| Upgraded Car | Upgrading the first car to a family car |
| First Apartment | It's time to settle down and make your new house a home. |
| House - upgraded! | Upgrading from studio apartment to 3 bedrooms apartment |
| Bought a landed property | You are moving up in the world, you now own land! It's time to use those green fingers of yours. |
| Got Married | Congrats! You just got married to your childhood sweetheart! |
| Having a Child | Your family is growning! It's time to welcome this bundle of joy into the world! |
| Won an award | WOW! You have been recognised for your amazing work! We can't wait to see what you do next. |
| Long service award at company! | 20 years at the same company is quite an achievement! |
| Start my own business | You've taken a leap of faith, let's hope this new venture succeeds. |
| Bought my own First class air-tickets to holiday | That recent bonus has been put straight to work in flying you first class around the world on your next adventure! |
| Climbed Mount Everest | Yes the hard part is climbing up, but the hardest part is making it back down. This is an achievement you will never forget and has tought you lessons you will take into the rest of your life. |
| Invited to speak on TEDx | Your voice matters and people clearly want to hear more of what you want to say! |
| Published a book | You're now a published author! We can't wait to read your next book! |
| Have a street named after me! | Next level unlocked. There aren't many people who can say they lived to see the day a street was named after them. |

| | |
|---|---|
| Overcome cancer! | You may have won the battle, but you couldn't have done it without your friends and family. Here's to many more years with them! |
| Starting over again | Your business had gone bust but you managed to convinced some investor to start over again |
| Starting over again | Got over your divorce and start dating again |
| Proud parent | My child won the best student award in school |
| Wedding Anniversary | Celebrating 20 years of marriage and still passionately in love! |
| Stood up to bully at work | Enough is enough! Well done for being courageous and standing up to the bully. |
| Wedding Again! | Just because it didn't work out the first time, doesn't mean this isn't the one. |

## Appendix A-3: Situation Cards Scenarios

| Situation Cards Scenarios | Description in the card |
|---|---|
| Stolen credits | My colleague took credits for the work that I have done |
| A Bad Day! | The day that everything went wrong |
| Swindled | I've got scammed $100,000! |
| Unrecognised efforts | I have been working very hard the whole year, but still being by-passed for promotions |
| Overworked | I have been working 15hours every day for the past month! |
| Discriminated | You are in the "out-group" because of your gender, race or anything! |
| Back-stabbed | I thought she is my best friend, but she is spreading malicious gossips about me in the office |
| Obnoxious colleague | I have an obnoxious colleague who keeps correcting my grammar |
| Automation is coming | I am being replaced by a robot |
| Dead End Project | Your project is put ——————————on hold indefinitely, ——————————once again. |
| Fickle Minded Bosses | Management keeps changing their minds. |
| Living on the office's couch | Your team stays late and ——————————works long hours regularly, lowering moral and productivity. |
| I Don't Have a Crystal Ball | Uncertainty about the future means making plans is difficult |
| No trust here | The bosses and senior management can't stop micro-managing. |
| Covert bullying at work | My supervisor have been piling work unfairly on me and also constantly criticised my work with sacarsm |
| Mid-life crisis at 40! | You have hit mid-life crisis, at the cross road of don't know what to do |
| Looking for a job | Sent in 100 job applications but heard back from none. |
| Retrenched | I have been retrenched |
| Back to school | Decided to go back to school, to do a part-time postgrad certification. |
| Imposter Syndrome | I don't feel I deserve the promotion or recognitions others have given me |
| Technologically challenged | Can't catch up with all the new systems and softwares implemented in the office. |
| Debts Pilling-Up | Just can't seem to clear my debt even after the promotion and increment |
| To go or not to go | Being offered my dream job overseas, but means leaving my family, friends and partner behind |
| Routined life | Have been doing the same job, same routine in the same company for last 10 years |
| Lonely work life | We don't socialise in my office and no one lunches with me |
| Affairs in the office | I found out that my colleague is sleeping with the boss. |
| 2nd Career | Burnt out from my job. Want to try something new but don't know where to start. |
| Resignation or not | Hate my job, but it pays the bills |
| Indecent Proposal | My boss made me an indecent proposal in-return for my promotions at work |

## Appendix B: Study Equipment - First Prototype of the Board Game & Cards Design



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# *Strengthening Resilience Against Vicarious Trauma: A Counselor-Developed Training Program for Physician Residents*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
The increasing prevalence of vicarious trauma among physician residents in Graduate Medical Education (GME) programs poses significant challenges to both individual well-being and patient care quality (Gundacker et al., 2021; Seo et al., 2021). This paper introduces a novel training program, Support-U Training Program (SUTP), crafted by counselors within these programs to enhance resilience against such traumas. Utilizing innovative strategies, SUTP focuses on cultivating long-term coping mechanisms through peer support networks and resilience-building techniques. The program not only addresses immediate stressors but also integrates continuous professional development and mental health maintenance, thus fostering a culture of self-care and empathy among healthcare providers. The pilot implementation of SUTP shows promising results in improving communication and support capabilities among participants, with notable advancements in managing stress and emotional exhaustion that often precede burnout. This paper discusses the program's development, its theoretical underpinnings, and the positive impacts observed during its pilot phase, alongside implications for future practice and research in GME environments.

Keywords: Vicarious Trauma, Resilience, Interprofessional Collaboration, Peer Support

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## Introduction

In the demanding field of healthcare, the exposure of physician residents to vicarious trauma is a growing concern that impacts both individual well-being and the quality of patient care (Jacob & Lambert, 2021). Graduate Medical Education (GME) programs play a pivotal role in training new healthcare professionals, but they also bring them face-to-face with the emotional and psychological challenges inherent in patient care (Ravi et al., 2021). Recognizing the vital need for robust support systems, counselors within these programs have developed innovative strategies to foster resilience and support amongst their ranks. These strategies not only focus on addressing immediate stressors but also emphasize long-term mental health maintenance, helping physician residents build sustainable coping mechanisms throughout their careers. By integrating peer support networks into GME programs, counselors can cultivate a culture of self-care and empathy that ultimately benefits both healthcare providers and the patients they serve.

## Literature Review

Recent literature underscores the significant psychological distress that can arise from vicarious trauma and the subsequent need for effective support systems within healthcare institutions (Gundacker et al., 2021; Jacob & Lambert, 2021; Seo et al., 2021). It has been suggested that medical errors and unexpected patient outcomes can lead to severe emotional and physical distress among physicians, often causing them to second-guess their clinical competence and, in some cases, even leading to the abandonment of their positions (Agarwal, Brooks, & Greenberg, 2020). Such findings have prompted the development of targeted interventions like the SUTP, designed to address these vulnerabilities by leveraging the relationship-building expertise of counselors.

Building on the initial identification of vicarious trauma's effects, further research points to the essential role of continuous training programs in cultivating emotional resilience within the healthcare sector (Cordova, Gimmler & Osterberg, 2020). Studies emphasize the necessity of developing multifaceted approaches that address both the cognitive and emotional competencies required to handle the pressures of medical practice effectively. For instance, Goldhagen and colleagues (2015) explored the impact of mindfulness and communication training integrated into residency programs, which significantly reduced symptoms of stress and burnout among participants. These results affirm the value of implementing comprehensive educational strategies that include both personal wellness practices and professional skill development (Goldhagen et al., 2023). Furthermore, implementing empathy curriculum for physician resident training has shown promising outcomes in enhancing self-awareness, increasing emotional intelligence among healthcare providers, and augmenting crucial skills for mitigating the effects of vicarious trauma (Quinn et al., 2020).

Moreover, community-based support training within medical institutions has also gained recent attention. Lepisto (2021) identified six critical themes that comprised a successful peer support training program: knowledge of communication techniques, approach tactics, understanding hospital resources, commitment to helping colleagues, recognizing the importance of burnout, and fostering a better understanding of oneself. This comprehensive focus not only equips physician residents with the necessary tools to address vicarious trauma effectively but also cultivates a supportive network that enhances collective resilience. By embedding these educational and emotional support frameworks within their daily practices, healthcare

professionals can significantly mitigate the impacts of burnout and improve overall job satisfaction.

## Training Program Development

The SUTP is designed based on robust literature that highlights the critical need for trauma resilience in healthcare settings, particularly among physician residents. The program's objective is to fortify trauma resilience by training physicians to provide vital peer support, addressing the issue of vicarious trauma experienced by healthcare professionals. By focusing on essential communication skills such as empathy, active listening, and open-ended questioning, SUTP facilitates the development of a robust peer support network.

This initiative not only leverages these key communicative techniques but also introduces a structured method for recognizing and addressing vicarious trauma among peers. It empowers participants to maintain professional boundaries while effectively supporting their colleagues, thereby preventing the accumulation of stress and emotional exhaustion that often leads to burnout. The importance of peer support is underscored by the prevalence of burnout and the unique vulnerabilities of physicians, such as the ingrained culture of perfectionism, self-sacrifice, and the stigmatization of seeking help.

The pilot phase of the program has shown promising results that come from our survey and a focus group with the chief residents of each program. The three programs that participated included Internal Medicine, Emergency Medicine and Family Medicine. From these programs, 67 residents participated in the survey and 6 prepared in the focus group. The findings in the next section highlight the effectiveness of the training in improving not only individual resilience but also in fostering a supportive community atmosphere.

## Implications for Practice and Future Research

The success of the SUTP program highlights the critical need for dynamic adaptation in training methods to keep pace with the rapidly changing healthcare environment. As technology and medical practices evolve, so too must the educational programs that support the emotional and professional growth of healthcare providers. It is imperative that future versions of such training programs incorporate advanced technological tools such as virtual reality simulations and AI-driven analytics to enhance learning experiences and provide real-time feedback. These technological integrations could further personalize learning paths, enabling residents to navigate complex emotional situations with greater competence and confidence.

The emphasis on community and collaboration within the SUTP program sheds light on the importance of fostering a culture of openness and mutual support among healthcare professionals. Future research should aim to conduct longitudinal studies to validate the long-term benefits of the SUTP approach. Moreover, it is essential to continue refining these interventions to ensure they are adapted to the evolving needs of healthcare professionals and the patients they serve.

## Results

The SUTP has shown considerable success in enhancing the knowledge and skills of physician residents regarding vicarious trauma, peer support, and communication, as demonstrated by the results of the evaluation surveys conducted following the training sessions. The survey

data obtained from participants who underwent the SUTP paint a clear picture of its impact on the physician residents' competencies in key areas. The training yielded a substantial impact on the respondents' awareness of vicarious trauma, with an impressive 85% indicating a marked increase in their understanding as a direct result of the program. This increase in awareness demonstrates how this training equips them to better recognize and manage the effects of this occupational hazard which is critical in the healthcare environment. This improvement in awareness is essential for cultivating a resilient workforce capable of providing high-quality patient care while maintaining their own mental well-being.

In addition to vicarious trauma, the survey responses indicated that 62% of the participants strongly felt that their ability to provide peer support to other residents was enhanced. Similarly, a comparable figure of 63% strongly agreed that their listening and communication skills were bolstered. These skills are the cornerstone of effective teamwork and peer support within the high-stress environment of medical residencies. The substantial increase in knowledge and confidence in these areas is indicative of the program's success in not only enhancing individual capabilities but also in strengthening the communal support network among residents, which is vital for mitigating the challenges associated with vicarious trauma in the medical field.

Incorporating feedback from the focus group with chief residents across Internal Medicine, Family Medicine, and Emergency Medicine, further supports the positive outcomes observed with the SUTP. The chief residents confirmed the application of communication skills learned through the program, indicating a high frequency of use, with 3-4 instances per week where these skills were utilized to provide support to their peers. The chief residents provided compelling testimony on how the SUTP skills have been crucial in their role. They detailed how the training facilitated meaningful conversations with co-residents, both during challenging patient encounters and in managing daily stresses like fatigue and scheduling difficulties. This empowerment has enabled them to provide support without taking on their peers' stress, a key factor in maintaining their own well-being.

A significant benefit noted from the training was an increase in mindfulness, particularly in recognizing that personal issues can often underlie professional challenges. This awareness has proven valuable in addressing professionalism cases within the residency program. Additionally, the training has been commended for encouraging open communication, normalizing the discussion of stress, and day-to-day tasks, underscoring that sometimes acknowledgment of shared experiences is as crucial as finding solutions. These qualitative insights from the focus group reinforce the quantitative data, illustrating that the SUTP has not only provided the residents with knowledge and skills but also influenced behavioral changes that have a positive impact on their professional experiences. Residents now feel better prepared to engage with peers in a supportive capacity, thereby contributing to a more resilient work environment.

## Conclusion: Implications for the Future

In conclusion, the development and implementation of the SUTP represent a significant step forward in addressing the challenges of vicarious trauma among physician residents. Through a comprehensive approach that integrates peer support, communication skills, and mindfulness techniques, the SUTP has demonstrated tangible benefits in enhancing individual resilience and fostering a supportive community within healthcare institutions. The success of the SUTP, as evidenced by survey data and feedback from chief residents, underscores the critical role of

ongoing training programs in equipping healthcare professionals with the tools they need to navigate the emotional demands of their profession. By increasing awareness of vicarious trauma, improving peer support capabilities, and enhancing communication skills, the program contributes to a more resilient workforce capable of delivering high-quality patient care while safeguarding their own well-being.

Looking ahead, the implications for practice and future research are substantial. As healthcare environments continue to evolve, training programs like the SUTP must adapt to incorporate advanced technological tools and personalized learning experiences. Longitudinal studies are needed to validate the long-term benefits of these interventions and ensure they remain relevant to the changing needs of healthcare professionals and patients alike.

Ultimately, the SUTP serves as a beacon of progress in strengthening resilience against vicarious trauma, highlighting the importance of proactive support systems and ongoing professional development in the healthcare sector.

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# *Optimizing Child Development Through the First Three Years: The Important of Responsive Parenting and Early Learning Stimulation*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
In Indonesia, the prevalence of inappropriate childcare remains relatively high. Data from the Indonesian Early Childhood Report, in 2021, 4 out of 10 early childhood children experience inadequate childcare. Meanwhile, from 0–3 years old, the brain grows rapidly to form strong connection, thus decent childcare is important during this period. Responsive parenting and early learning are two important domains that could support children's developmental needs. Unfortunately, in Indonesia there are still not enough research have been done to explore decent parenting. This quantitative study investigates responsive parenting practices and early learning implementation for children aged 0-3 years in three Indonesian cities: DKI Jakarta, Pandeglang, and Kupang. Data collected from 1200 parents, assessed by the modified of Infant-Toddler Home Observation for Measurement of The Environment (Infant-Toddler HOME) instrument. Result shows 85% of participants are able to demonstrate responsive parenting and 82.4% can provide early learning domain. Early learning score found positively correlated with parents' educational level (.232, $p<0.01$), social-economy level (.269, $p<0.01$), and the child's age (.318, $p<0.01$). The availability of learning materials varies significantly between respondents residing in urban and rural areas, highlighting notable contrasts between two environments. This finding serves as a baseline for further research and intervention on families. Future intervention should be applied to support Indonesian children's optimal development.

Keywords: Responsive Parenting, Early Learning, Home Stimulation, Toddler

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## Introduction

Children's development occurs very rapidly during the golden period, from the age of 0 to 5 years. This critical period, known as '*the first window of opportunity',* the brain has optimal capacity to absorb various information and form strong connections as the child's base to think, behave, and live the later life (Center on The Developing Child Harvard University, 2015; Center for Community Child Health, 2017). Children's brain development is not only influenced by biological factors, it also requires exposure to stimulation and experiences from the environment. A child's home environment, including home stimulation and parental attitudes towards the child plays a significant role in supporting the children's development and influencing their future adult life (Parveen, 2007; Tierney & Nelson III, 2013; The National Academy of Science, Engineering, & Medicine, 2015; Mansur & Setyaningsih, 2021). When home environment is not supportive, children may experience under stimulation and stress, which result in suboptimal brain growth (Center on The Developing Child Harvard University, 2015).

Based on Indonesian Law No. 35 Year 2014 and Government Regulation No. 44 Year 2017 about 'Parenting Practices' have stipulated that every child has the right to receive proper parenting and care. According to Caldwell and Bradley (2003) a stimulating and supportive home environment is an environment that is responsive to children, accepts children's behavior without punitive action, has a clear structure and organization, provides learning materials for children, directly involved parents in stimulation and childcare, and provides diversity in stimulation. In line with this, responsive parenting is one of the most important domains to support a stimulating home environment.

According to The Nurturing Care Framework (2018), responsiveness in parenting refers to parent's ability to understand and meet children's need based on the child's behavior. Examples of parents' responsive behavior are how parents respond to children's words or verbalizations, giving praise for children's positive behavior, parents' activeness in naming objects that children see. Research shows that parents who are responsive to their children have various benefits, first and foremost children will feel safe and comfortable around their parents, so this can support healthy attachment formation. Parents' responsiveness also supporting various aspects of child development, namely language and communication development, cognitive abilities, social skills, and fewer behavioral and emotional problems (Landry et al., 2001; Warren & Brandy, 2007; Booth & Jernberg, 2010; Hanen Early Language Program, 2018; Hentschel, Yousafzai, Aboud, 2021; Luby, Rogers, McLaughlin, 2022).

Early learning at home also plays an important role to support children's development. Early learning refers to various stimulation, experiences, and exposures that lead to learning that can be provided through play, literacy activities, learning materials, and support in the children's learning process (Fesseha & Pyle, 2016; Milner, et.al., 2019). In early child, playing and reading were found to be useful to support and improve children's ability to think, communicate, and connect with the world (Nores & Barnett, 2009; Black et al., 2016).

Unfortunately, according to a report from the Indonesian Ministry of Women Empowerment and Child Protection, the trend of inappropriate child care in Indonesia from 2019 - 2021 is still relatively high. Referring to the 2021 Early Childhood Profile Report, 3.69% early childhood children are reported to have received inappropriate care (Badan Pusat Statistik, 2022). In line with this report, Mansur & Setyaningsih (2021) stated that more than half of

the Indonesian parents in their study provided low developmental stimulation for their children. Data from SIMFONI PPA (2023) from the 1st of January 2023 to June 2023 shows there have been 5,604 cases of violence against children. More specifically, 730 victims were children aged 0 to 5 years. The high amounts of inappropriate care and children's violence represent that responsive parenting has not been applied in many household systems. In fact, inappropriate child care has a huge long-term risk of experiencing various problems in their lives, that is social-emotional problem, behavioral problem, deterioration of cognitive function and academic performance, developmental regression, and inhibition (Mizenberg, Poole, & Vinogradov, 2008; Baker & Cunningham, 2009; de Vera, 2018; Harper, 2018).

Various factors are considered to be closely related to parents' ability in providing responsive parenting and early learning. Low income parents, problems in mental health, and low social support can interfere the quality of responsive parenting (Moore, et.al., 2013; Lurie, et.al., 2021). Parents with low educational and socioeconomic levels are less able to afford high quality stimulation, engage in supporting the child, have limited information to support their children's development, have less family investment on education and learning materials (de Coulon, et. al., 2011; Lucassen, et.al., 2015; Miller, Votruba-Drzal, & Coley, 2019; Berkes, et.al., 2019; Lurie, et.al., 2021). Childhood trauma in parents also affect their ability in parenting, for example low self-esteem in nurturing children, anxious in raising children, feels detached or too attached, overwhelm by children's emotional needs, and so on (Pressley & Wilson, 2022).

By the time this study conducted, data on inappropriate child care has mostly been obtained through reporting to institutions, the presented data tend to focuses only to the amount of violence on children. There have not been many researches and surveys that explore the level of decent parenting in reality. Meanwhile, the field data related to responsive parenting practices and early learning requires as the first step to make interventions.

Based on yearly report by Badan Pusat Statistik (2022), in 2021 the percentage of toddlers who have received inappropriate care is greater in rural areas than urban areas (4.36% compared to 3.17%). Referring to those report, researcher see the urgency to collect data from both urban and rural area which have affiliation with Tanoto Foundation. First affiliated area is DKI Jakarta as the capital city accounts for 2.36% inappropriate care; second affiliated area is Banten which reported has 4.10% inappropriate care. In addition, researcher also collecting data from East Nusa Tenggara province as it is also among the provinces in Indonesia that contribute high percentages of inappropriate parenting, viz. 7.49%. This study conducted with the aim of being a preliminary study, expected to provide a field data as a basis for the Indonesian family interventions to support 0-3 years old children's development.

## Method

### *Research Design*

Quantitative study design was applied in this research to evaluate home stimulation, specifically responsive parenting and early learning. Children and parents' demographic data; and parents' childhood experience were also examined to find out what variables correlated with home stimulation.

### *Participants and Data Collection*

A multistage random sampling method was applied. Researchers implement primary sampling unit up to village level, then conducted randomization to select two neighborhood areas. From each selected area, then it was selected again two smaller division group of household to find 10 respondents from each group. The data were collected from 1200 primary caregivers of 0 – 3 years old children consist; (a) 400 participants from DKI Jakarta; (b) 400 participants from Pandeglang, Banten; and (c) 400 participants reside in Kupang, East Nusa Tenggara. All cities are located in Indonesia.

The data were collected from February 26$^{th}$ until March 15$^{th}$, 2023. This research use structured interview and direct observation based on the test instrument. Prior to data collection, respondents were given informed consent containing information regarding research objectives, procedures, respondents' rights, guarantees of data confidentiality, as well as the risks and benefits of research for respondents. Researchers also ask for consent from respondents to provide data voluntarily.

### *Measurement*

#### *Respondent's Demographic Data*

Demographic data of each respondent were collected using a structured questionnaire developed by researcher. Parents' age, gender, ethnicity, marital status, education level, occupation, areas of living, household income and excess, children's gender, age, and birth order were assessed.

#### *Responsive Parenting and Early Learning*

Based on The Nurturing Care Framework (NCF) guideline, Home Observation for Measurement of The Environment (HOME) was used to evaluate responsive parenting and early learning (Hentschel, Yousafzai, & Aboud, 2021). In this research, the modification of Infant-Toddler HOME was applied to measure the variables. Basically, Infant-Toddler HOME consists of six subscales, that is: (1) Parents' Responsiveness; (2) Acceptance and Nurturing; (3) Structure and Organization; (4) Learning material (e.g. the number of children's books in the household); (5) Parents' Involvement; and (6) Variety. Responsive parenting was examined by the 1$^{st}$ subscale (parents' responsiveness) and early learning assessed by the 4$^{th}$ subscale (learning material).

#### *Parents' Adverse Childhood Experience*

Parents' childhood history was measured by The Adverse Childhood Experience (ACE).

### *Analysis Method*

The data from 1200 respondents were double cleaned, checked for missing values and outliers. Researchers also carried out data rechecking by selecting 20% of answers randomly from the total sample. Descriptive analyses were performed to see the results of the distribution of participants' answers. Associations between total score of Infant-Toddler HOME questionnaire, participant demographic data, the parents and children's ACE, were determined by Pearson's product-moment and Spearman correlation. One-way Anova and t-test also conducted to evaluate the differences of home stimulation score between respondents in each cities. Cronbach Alpha were conducted to count the reliability coefficients of Infant-Toddler HOME practices survey was 0.668.

## Results

Table 1 shows the characteristics of parents' respondents. The majority of respondents had a relationship with their children as biological parents (90.6%). The age category of respondents mostly ranged from 26 - 30 years old (27.7%), followed by 31 - 35 years old (25.4%) and 36 - 40 years old (17.1%). Most of the parents' respondents, 41.4%, are senior high school graduates. About 96% of parents' respondents are married. The children's demographic data can be found in Table 2. From the children's data, there is no significant differences between boy (51%) and girl (49%) respondents. The age category of children respondents mostly ranged from 13 – 25 months old (36.3%) followed by 25 – 36 months old (31.8%).

***Table 1: Parents' Demographic Data***

| Parents' Demographic Data | Percentage |
|---|---|
| **Parents' Relationship To The Child** | |
| Biological Parents | 90.6% |
| Grandparents | 6.3% |
| Family members | 1.4% |
| Non-family members | 1.7% |
| **Parents' Age Group** | |
| <20 years old | 1.2% |
| 21 – 25 years old | 12.6% |
| 26 – 30 years old | 27.7% |
| 31 – 35 years old | 25.4% |
| 36 – 40 years old | 17.1% |
| 41 – 45 years old | 8.3% |
| 46 – 50 years old | 2.1% |
| 51 – 55 years old | 1.9% |
| 56 – 60 years old | 1.8% |
| 61 – 65 years old | 0.8% |
| 66 – 70 years old | 0.3% |
| 71 – 75 years old | 0.1% |
| 76+ years old | 0.8% |
| **Parents' Gender** | |
| Male | 12.6% |
| Female | 87.4% |
| **Parents' Educational Level** | |
| Not entering school | 2.0% |
| Elementary level | 18.9% |
| Junior high school | 18.8% |
| Senior high school | 41.4% |
| Associate's degree | 4.1% |
| Bachelor degree | 12.5% |
| Master degree | 0.9% |
| Postgraduate | 1.3% |
| **Parents' Monthly Outcome** | |
| < IDR 900.000 | 20.3% |
| IDR 900.000 – IDR. 1.250.000 | 16.9% |
| IDR 1.250.001 – IDR. 1.750.000 | 15.5% |
| | 14.8% |

| | |
|---|---|
| IDR 1.750.001 – IDR 2.500.000 | 20.8% |
| IDR 2.500.001 – IDR 4.000.000 | 8.4% |
| IDR 4.000.001 – IDR 6.000.000 | 2.1% |
| IDR 6.000.001 – IDR 10.000.000 | 0.3% |
| IDR 10.000.001 – Rp. 15.000.000 | 0.6% |
| IDR 15.000.001 – IDR 30.000.000 | 0.3% |
| >IDR 30.000.000 | |
| **Parents' Marital Status** | |
| Married | 96.3% |
| Separated (not divorce) | 0.8% |
| Divorced | 1.3% |
| Death of the spouse | 1.6% |

***Table 2: Children's Demographic Data***

| Children's Demographic Data | Percentage |
|---|---|
| **Children's Age Group** | |
| 0 – 6 months old | 13.6% |
| 7 – 12 months old | 18.3% |
| 13 – 24 months old | 36.3% |
| 25 – 36 months old | 31.8% |
| **Children's Gender** | |
| Male | 51% |
| Female | 49% |

***Table 3: HOME Total Score Descriptive Statistic***

| Areas | N | Min Score | Max Score | Mean HOME | Std. Dev. HOME |
|---|---|---|---|---|---|
| All areas | 1200 | 24 | 86 | 62.03 | 9.392 |
| DKI Jakarta | 400 | 28 | 86 | 65.29 | 9.470 |
| Kupang | 400 | 33 | 84 | 60.52 | 9.415 |
| Pandeglang | 400 | 24 | 79 | 60.27 | 8.407 |

As stated in Figure 1 (HOME Total Score Categories), result shows only 15.8% of parents with children under 3 years old had an adequate HOME score, meanwhile 82.4% of studied parents do not practice adequate child caregiving. The percentages of HOME Scores for each dimension can be seen in Figure 2. From the figure, on the responsive parenting dimension, 21.8% parents are placed in adequate category and the rest of the respondents (78.2%) have not demonstrated adequate ability to apply responsive parenting. On the learning material subscale, 15.1% of respondents scored in the adequate category, meanwhile 84.9% respondents have a lack access to provide optimum learning materials. Respondents who got an adequate score on acceptance, warm, and nurture scale were only 9.8%, while 90.2% of the parents have not applied a warming and nurturing parenting well. Furthermore, 88.3% of the respondents difficult to apply in structure at home. Only 11.7% of parents got adequate score in structure and organization subscale. From parents' involvement subscale, 27% of respondents got adequate score, 73% of them have not been involved properly. The last HOME subscale, variety, 15.3% participants are placed in adequate category, but 84.7% of

the parents do not achieve a high score in providing a variety of stimulation in their parenting practices.

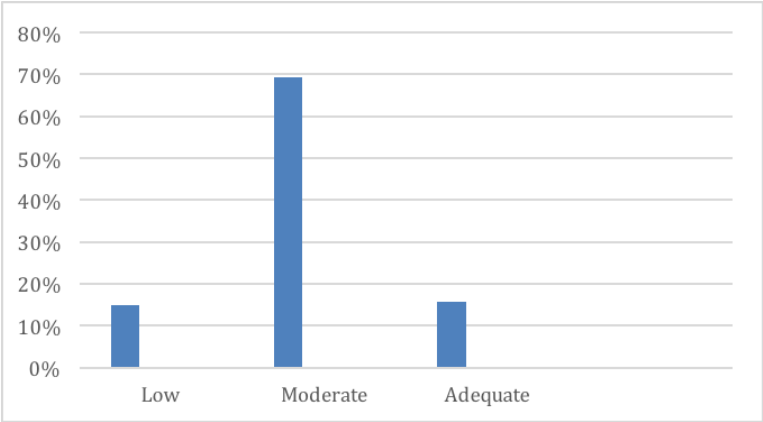



***Figure 1: HOME Total Score Categories***

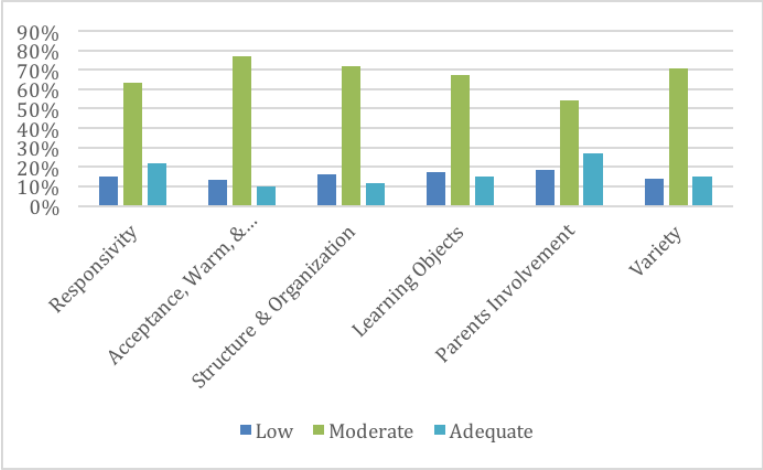



***Figure 2: HOME Dimension Score Categories***

Correlation inter-variable can be seen in Table 4. Result shows a positive correlation between parent's education level with total home stimulation (.211, *p<0.01*), learning material (.232, *p<0.001*), structure and organization (.114, *p<0.001*), parents' involvement (.218, *p<0.001*), and variety (.121, *p<0.001*). Parent's socio-economic level correlated positively with total home stimulation score (.212, *p<0.01*), learning material (.269, *p<0.01*), parents' involvement (.191, *p<0.01*), and variety (.121, *p<0.01*). Parent's childhood experience assessed through parents' ACE which correlated with total home stimulation score (.158, *p<0.01*), structure and organization subscale (.159, *p<0.01*), and acceptance, warm, and nurture (.267, *p<0.01).* Meanwhile, children's age was positively correlated with the total score of HOME (.197, p<0.01), object learning (.317, p<0.01), and variety (.154, p<0.01). Furthermore, the relationship between grandparents and grandchild has a negative correlation with the parent's involvement subscale (-.068, *p<0.01*), in other words, children who are raised by grandparents have low parental involvement. Parents' gender also shows a correlation with parents' involvement, female parents found to be more involved in parenting (-.098, *p<0.001*).

*Table 4.a: Correlation Inter-variables Pearson*

| | Parent's Age | Parents' Level of Education | Parent's Socio-Economic Status | Parents' ACE | Child's Age |
|---|---|---|---|---|---|
| **HOME Total Score** | .028 *p>0.05* | **.211**** ***p<0.01*** | **.212**** ***p<0.01*** | **.158**** ***p<0.001*** | **.197**** ***p<0.01*** |
| **Responsive Parenting** | .0091 *p>0.05* | .0076 *p>0.05* | -.024 *p>0.05* | -.0079 *p>0.05* | -.0047 *p>0.05* |
| **Learning Material** | .0189 *p>0.05* | **.232**** ***p<0.01*** | **.269**** ***p<0.01*** | .024 *p>0.05* | **.318**** ***p<0.01*** |
| **Structure & Organizaton** | .0076 *p>0.05* | **.114**** ***p<0.01*** | .099 *p>0.05* | **.159**** ***p<0.01*** | .108 *p>0.05* |
| **Acceptance, Warm, & Nurturing** | .0085 *p>0.05* | -.0097 *p>0.05* | .051 *p>0.05* | **.267**** ***p<0.01*** | -.074 *p>0.05* |
| **Parents' Involvement** | -.033 *p>0.05* | **.218**** ***p>0.01*** | **.191**** ***p<0.01*** | .086 *p>0.05* | -.016 *p>0.05* |
| **Variety** | .043 *p>0.05* | **.121**** ***p<0.01*** | **.129**** ***p<0.01*** | .086 *p>0.05* | **.154**** ***p<0.01*** |

*Table 4.b: Correlation Inter-variables Spearman*

| | Parents' Relational Status With The Child (Grandchild) | Parent's Gender (Male) | Parents' Gender (Female) |
|---|---|---|---|
| **Parents' Involvement** | **-.068**** ***p>0.01*** | **-.098**** ***p<0.01*** | **.098**** ***p<0.01*** |

One way ANOVA and t-test was conducted to evaluate the differences of HOME score result among three areas. In Table 5, it is found that there are score different of HOME stimulation between respondents who live in DKI Jakarta with respondents in Pandeglang (*p <0.01,* mean differences 3.7561) and Kupang (*p <0.01,* mean differences 3.5111).

*Table 5: T-Test*

| | DKI Jakarta | Kupang, East Nusa Tenggara | Pandeglang, Banten |
|---|---|---|---|
| **DKI Jakarta** | 1.2639 *p>0.05* | **3.511**** ***p<0.01*** | **3.756**** ***p<0.001*** |
| **Kupang, East Nusa Tenggara** | **3.511**** ***p<0.01*** | 1.2639 *p>0.05* | -1.019 *p>0.05* |
| **Pandeglang, Banten** | **3.756**** ***p<0.001*** | -1.019 *p>0.05* | 1.2639 *p>0.05* |

## Conclusion

HOME scores have a positive correlation with parent's education and socio-economic level, which means the better the socioeconomic level of parents, the higher home stimulation can be provided. High level of education and socio-economic status, as well as stable employment are important components in forming a supportive home environment to support the process of intergenerational knowledge transfer and children's achievement (Davis-Kean, 2005; Davis-Kean, Tighe, Waters, 2021).

In this study, no correlation was found between parent's responsiveness and demographic data. Warren and Brady (2007) states that there are some characteristics of parents associated with parents' responsive behavior, especially by mothers. Not only demographic background, but mental health problems also can hinder parent to show responsiveness to children. This finding also backup by field data that in total 7% of parents have a history of being neglected or abused. As this research was not intended to assess parent's mental health condition, thus in order to support better responsive parenting, especially for vulnerable parent groups, the provision of mental health services on child development that are evenly distributed need to be given more attention by public stakeholders.

A unique finding on the learning material subscale was found in this study. In this study, the availability of learning material such as book and playing tools are link to parents' education level, socio–economic level, and children's age. The variation of toys between low education parents (no school background, elementary school graduates) and parents with at least high school education have different variations. Parents with low education provide more physical-motor play activities for their children (running, cycling, playing kites, balls), while parents with at least high school education provide more varies toys, including physical-motor, educational (eg. puzzle, blocks), and imaginative toys (eg. dolls). Children of parents with low socio-economic status tend to play functionally (e.g. running around, pull and push, sorting objects) rather than engaging in constructive, sociodramatic and pretend play. This can be caused by poor quality parent-child interactions, less responsive parents, and limited parental resources to support children's play (Rubin et al., 1976; Fromberg & Bergen, 2015). Cost-related factor also contributes to the parent's decision to buy toys, whereas low income parents tend to have limited resources to fulfil learning materials for the children (Kurdi, 2017; Lurie, et.al., 2021). In line with Yulianti, Denessen and Droop's (2019) explanation, parents with middle and high education levels can provide additional materials for children to learn, such as encyclopedias, tablet games and access to the internet. Children from families with high socio-economic status also tend to enjoy more opportunities and resources for learning (Sun et al., 2018).

In learning material subscale, this research found that awareness of reading and book ownership as an effort to stimulate children's literacy is still limited. In the HOME assessment manual, parents who provide at least three books to their children and read to them at least three times a week will receive one score (the higher the score, the better the quality of environmental stimulation). In fact, in the field data, parents who read to their children at least three times a week were only 21.4%, while 56.6% of parents never read to their children. Children who have at least three books are only 25.5% and those who do not have at least three books are 51.2%. Even though, the number of children's books at home is also related to their cognitive development (Salinas, Valenzuela, Aranis, 2021). In the context of Indonesia, in general, literacy awareness is still looked at the responsibility of schools only, especially in rural areas. Wijaya, et.al. (2019) stated factors that hinder support for

children's literacy in Indonesia are parents who do not have high reading competence, so that at home there is no reading habit, reading assistance, and parents do not spend much time accompanying children to carry out literacy activities. In Wijaya's study, it can be seen that regional factors of residence, socio-economic conditions, and parental education level play a major role to enhance parents' ability to stimulate home literacy. It is align with this research finding that the data shows that parents with higher education (senior high school and above) tend to have an awareness of reading books to their children. Literacy skill is mainly learned from Indonesian subject at school, whereas at an early age children actually need to practice their literacy skill and develop pre-reading and pre-writing foundation so that later at school they may not experience problems in the learning process (Dove, et al., 2015; Senechal & LeFreve, 2002). Stern and Nordtrum (2014) stated that the ability of students in Indonesia to read fluently and understand reading material is only 70% which is relatively low. This literacy problem will have a big impact in the future if it is not addressed immediately, in which early intervention to encourage children reading habit at home must be initiated from an early age.

Learning materials such as special rooms for playing or learning, learning tools, and toys are mostly owned by respondents who live in the capital city (DKI Jakarta), namely 43.8%. Meanwhile, only 27.4% of respondents in Kupang and 28.8% of respondents in Pandeglang have learning materials. This is in line with the explanation of Miller and Votruba-Drzal (2013), which in their study explained that children living in urban and suburban areas are more exposed to enriching and stimulating activities, so they have a higher quality of learning environment. Meanwhile, learning objects and materials are important facilities to support children's learning process (Gogoi, 2015; Fidesrinur, 2020). Infant cognitive development is at the sensory-motor stage, where children understand the world through their senses and exploration of the surrounding environment. At the next stage, toddler age, the child's thinking stage is at the concrete operational stage, meaning that children learn things from concrete objects (Marotz & Allen, 2013). Therefore, it is expected that at these critical ages children have a high exposure to concrete experiences and learn through people and objects (Gogoi, 2015).

In regard to the unequal ownership of learning facilities, play objects, and literacy awareness between respondents, policies and interventions are needed to support parents and children who come from low social-economic level, low educational levels, and those who live in rural areas. This can be a case that requires further exploration. In this case, policymakers can focus on giving education about the importance of learning object for toddler, improving learning materials in rural areas, and providing equal availability or access to play for disadvantaged children to support optimal child development and learning processes.

Other dimensions in HOME that also support children development are parents' involvement and the application of structure. We found that those dimensions account for large percentage of low category scores. In the parents' involvement dimension, 31.8% of fathers reported being less/not involved in childcare. This finding also validated through negative correlation result between gender (male parent) with parents' involvement subscale. In the context of Indonesian culture, men are regarded as leaders in the household system. In this patriarchal culture, the social norm that applies is that men are responsible for the family financial stability, but they are not charged with household and childcare (Dewi, 2019; Vioni & Liansah, 2023). This is against the developmental needs of children, namely the presence of a father involvement that is not just about providing financial support. Studies have shown the benefits of father involvement on children's physical, cognitive, social-emotional and mental

health development (Rosenberg & Wilcox, 2006; McMunn, et.al., 2017). The behavior of fathers who are able to build healthy relationships with mothers can also positively influence the child's development (Rosenberg & Wilcox, 2006; Garcia, et.al., 2022). In addition, the results of this study show that 29.5% of toddlers are looked after by other children who are less than 12 years old which according to Badan Pusat Statistik (2022), it falls into the category of inappropriate child care based on Indonesian standard, and turns out to be a large percentage collected from research data. When looking at the main reasons for the lack of parental involvement in children's daily lives, in general it is due to low income parents working and being in different areas with the child. Looking at this non-ideal situation, providing education with an aim to prepare parents ready to provide sufficient childcare should be promoted to prevent the lack of parental involvement in children's daily lives. For parents who are economically self-sufficient and stable, the use of daycare services can also be an alternative solution to support more ideal child care.

Once again, education level and social economic found to have correlation with parents' involvement. There are 39.8% from participants who were considered as parents with low education levels (junior high school and below). They feel doubtful and unsure of their own educational abilities, so they rely or leave the responsibility to others to help their children in education, for example support from uncles, aunts or neighbors. Research shows that parents who has no school background rarely spend time playing with their children and mostly in the low socioeconomic status group. That can be one of the barriers related to parental involvement because they prioritize activities to earn a living so that they cannot be present in children's activities (Yulianti, Denessen, & Droop, 2019). This is also reinforced by Gan and Billige's (2019) research which states that parents who are supportive of their children tend to have more socio-economic resources to use in participating in their children's learning. Parents with high socioeconomic status also not only invest more time and resources to support their children's development and learning, but also have good quality interactions with their children (Li, Sun, & Dong, 2022). Playing does not only come with toys, doing daily household chores or play simple things with children are also one of the learning facilities to provide various benefits in child development (UNICEF, 2018; Tepper, Howell, Bennett, 2022). The provision of training programs on how to interact and play with children that are simple, applicable, and able to stimulate children's development need to be encouraged, especially for parents from low socioeconomic backgrounds.

Problems in the structure and organization dimension lie in parents' ability to apply rules consistently, run routines with a clear structure, and there are differences of parenting behavior between caregivers. In fact, structure is one of the important aspects in a child's life. Consistent parents can provide a sense of security, children will perceive parents as predictable and trustworthy. Moreover, children who have a secure foundation have greater courage to explore the environment (Jernberg & Booth, 2012). Although the structure and organization dimension accounted for a considerably low percentage, parents in DKI Jakarta seemed to be more aware and able to apply rules consistently (68.8%) compared to the other two cities. This could be due to the fact that Jakarta is a capital city area that has a hustle-style life, so the demands of society to be structured are very clear.

Nevertheless, a total of 86.6% of respondents were considered to have the ability to show acceptance, warmth, and nurture to children, it is a protective factor for children's development that must be maintained. A total of 49.6% of respondents showed acceptance by giving their children positive labels, such as "*my darling*"; "*pretty girl/handsome*"; "*good boy/girl*". Results also show that on average respondents can show a good acceptance

response when their child is expressing negative emotions. A total of 35.8% of respondents chose to calm an emotional child by hugging. When the child made a mistake, 54.5% of respondents were also able to invite children to discuss, provide explanations, and assist them to making solutions. This is an important parenting behavior considering that toddler is a critical period for children in developing emotion regulation competency. Parents' acceptance to the children's emotion will help them to regulate and express their emotions appropriately (Gottman, et. al., 1996; Thompson & Meyer, 2007). This behavior aligned with authoritative parenting style and positive discipline concept, where parents show a warm and open attitude towards children's behavior, but can still provide enough control over children (Baumrind, 1971; Nelsen, Erwin, Dufy, 2015). Children with nurturing parents respond more positively to direction from parents than children with punitive parents (Eisenberg, 1992). They also tend to grow into healthier, capable, and optimally functioning adults if they have a nurturing home environment (Smith, et al., 1994).

In this preliminary study, 86.2% of participants showed moderate to adequate scores on the "*variety*" dimension. Referring to the results of the questionnaire, varied stimulation that is often shown by parents is mostly bringing their children to relatives' homes. Indonesia as a country with a collective culture has a close kinship with relatives. Even in suburban and rural areas, it is normal for parents and their families to live in the same residential area. Children and parents also often do activities together, such as having the same meal time with parents. These activities could a protective factor for children's development, especially for their social development. Children who have more opportunities to meet other people have superior social-emotional development because they have facilities to engage with the real world.

This research shows parents' ACE does not have any correlation with responsiveness and learning material subscale. Despite this finding, the correlational data showed that parents' ACE has a low significant positive correlation with HOME total score, structure and organization subscale, and acceptance subscale. This finding is quite contradictive with other findings that suggest parents with trauma related to some challenges in parenting and often described in a negative light (Widom, Cajaza, DuMount, 2015; Siverns & Morgan, 2019). However, the intergenerational trauma does not hold for all parents, some researcher state that the cycle of abuse must understood within a wider point of view. Sometime social and cultural contexts also play an important role in parental experiences and could be a protective factor for parents with childhood trauma (Berlin, Appleyard, & Dodge, 2011; Widom, Cajaza, DuMount, 2015, Siverns & Morgan, 2019). This result can be a cornerstone for future research or intervention that aim to explore emotional areas of parenting.

In overall, in order to be more representative or to provide a more comprehensive description of parenting behavior in Indonesia, this research needs to be conducted in more areas/provinces. The various ethnic groups in Indonesia produce different cultures. Cultural diversity in Indonesia can be a variable that greatly influences research results. Therefore, a qualitative survey that focuses on cultural factors on proper parenting in Indonesia is recommended to be conducted to get a broader view of the implementation of responsive parenting and early learning implementation. The involvement of multidisciplinary experts will also enrich the results of the research, such as sociologists to examine cultural factors and medical teams to examine physical health factors of children.

Various studies have addressed the impact of responsive parenting practices and home stimulation on children's future success. Longitudinal studies can be conducted to evaluate

the output of parenting practices interventions on children's development, such as intelligence capacity, school readiness, academic performance, and behavior. Data from this preliminary study can be utilized as baseline data for the intervention. Providing education is a concrete and fundamental step that must be accomplished. The manifestation of parenting theory is not easy to implement, so providing education for parents needs more concrete and practical. Regular multidisciplinary consultation (eg. psychologist, doctor) and follow-up sessions also need to be presented as a form of social support for parents in overcoming challenges in implementing responsive parenting practices and providing a better stimulation toward children.

## Acknowledgements

This study was funded by Tanoto Foundation. Researchers sincerely thank the School of Parenting, Tanoto Foundation, and Indonesian Ministry of Women Empowerment and Child Protection for the guidance and support.

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# *Balance and Gross Motor Skills Impairments Characterize Young Children With Autism Spectrum Disorders*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
Autism Spectrum Disorder **(**ASD) is a complex neurodevelopmental disorder. Recent studies indicate that motor impairments may be the one of the first signs of atypical development in ASD. The aim of the present study was to examine the motor function of young children with ASD, aged 4 to 6 years, in comparison to two groups of age- and gender-matched intellectually disabled (ID) and typically developing (TD) children. In total, 60 children, (20 ASD, 20 ID and 20 TD) participated in the study. The motor skills of the participants were assessed on eight subtests of the Movement Assessment Battery for Children (M-ABC) and seven clinical tests on fine and gross motor skills as well as on balance. Children with ASD had statistically significant lower performance than the TD children and children with ID in tests that examine gross motor skills and balance. Additionally, both ASD and ID groups presented significantly lower performance than TD group in fine motor tasks, but there was no significant difference between the two clinical groups. This study highlighted the specificity of motor impairment in ASD comparing the performance of children with ASD with a clinical group (ID) and a non-clinical group (TD). The present findings align with previous studies which support specific motor impairments of children with ASD and contribute to a better understanding of the specific and subtle motor impairments in ASD as well as to early diagnosis, clinical stratification, and treatment targets.

Keywords: Autism Spectrum Disorder, Intellectual Disability, Motor Skills, Balance

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## Introduction

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder that affects the cognitive and social emotional development of the developing child. Children with ASD experience challenges in communication and may show repetitive, restricted behaviors and interests (Neely et al., 2019).

According to Vlachos et al. (2013) achievements of motor milestones are significant for development and specially during preschool years as this is a critical period for the acquisition of motor skills. It is well known that during the preschool period motor capabilities and fundamental neuroanatomic structures show development, elaboration and myelination (Lakhani et al., 2016).

Even though difficulties in motor development is not the key symptom in the diagnosis of ASD, several studies confirm that motor difficulties are common in children with ASD (Kaur et al., 2018; Odeh et al., 2022; Williams et al., 2012; Wilson et al., 2018) and potentially lead to abnormalities in social communication. Such studies indicate that motor impairments may be one of the first signs of atypical development in children with ASD including basic motor impairments in balance, gait, coordination, fine and gross motor skills (Hirata et al., 2015; Siaperas et al., 2012; Stins & Emck, 2018; Vlachos et al., 2007; Whyatt & Craig, 2012).

However, the assessment of motor function in ASD has been less prioritized compared to other methods of behavioral phenotyping. Majiviona and Prior (1995) found that 67% of children with autism and 50% of children with Asperger syndrome showed an impairment in movement on the Henderson Test of Motor Impairment and Ghaziuddin and Butler (1998) showed that movement problems in Asperger's syndrome as well as in autism were common on the Bruininks- Oseretsky Test of Motor Proficiency. Green et al. (2008) found that 79% of children with autism exhibited definite movement problems on MABC, with an additional 10% showing borderline problems. Siaperas et al. (2012) as well as Whyatt and Craig (2012) found severe difficulties in children with autism compared to typically developing children. More specifically, Whyatt and Craig (2012) evaluated balance and ball skills in children with ASD in comparison with typically developing children and they found that autistic children's performance was worse compared to the typically developing children in the measured motor skills. In a review published recently, Stins and Emck (2018) reported that children with ASD scored worse than typically developing peers on tests of balance and postural stability and that children with ASD had difficulties in socializing and interaction. In addition, Zhou et al. (2020) found that the severity in the gross motor impairments of toddlers with ASD had a high association with the score of ADOS-2 (Autism Diagnostic Observation Schedule -2nd edition) and the social composite score of CSBS-DP-ITC (Symbolic Behavior Scales-Developmental Profile -Infant Toddler Checklist). Last but not least, in a recent review of Gandotra et al., (2020) it was concluded that children with ASD had less developed fundamental movement skills compared to their typically developing peers, with these difficulties persisting from early years into adulthood.

Despite research evidence indicating common motor difficulties in children with ASD that emerge early in development, there is conflicting evidence regarding which domains of motor development are affected. The present study aimed to investigate the motor function of preschool children with ASD compared to two groups: age-matched intellectually disabled (ID) and typically developing (TD) children, focusing on three motor domains: fine motor skills, gross motor skills, and balance.

## Methods

### *Participants*

The sample consisted of 20 children ranged in age from 4 to 6 years ($M$ = 4.51 years, SD = 0.48) with a diagnosis of ASD (19 boys and 1 girl), 20 children with a diagnosis of intellectual disability (19 boys and 1 girl) and 20 typically developing children (19 boys and 1 girl). The three groups were pair matched for age and gender. The group of children with ASD and ID were also matched on nonverbal IQ, using the Wechsler Non-Verbal (WNV) Scale of Ability (Jaquette et al., 2017; Wechsler & Naglieri, 2006). The WNV Scale of Ability is an individual assessment of general cognitive ability for ages 4 years and 0 months to 21 years and 11 months. The children of the two clinical groups had received a diagnosis of ASD or ID by experienced psychologists and psychiatrists according to the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (APA, 2013).

### *Materials & Procedure*

The Movement Assessment Battery for Children (M-ABC; Henderson & Sudgen, 1992) is a clinical assessment test used to determine the extent of impairment in fine and gross motor skills as well as balance (static and dynamic) and was used to assess the children's motor skills. In more detail, the battery is comprised of 8 subtests which assess posting coins, bicycle trail, bead threading, throwing ball into goal, catching bean bag, jumping over cord, one leg balance and walking heels raised. In addition, 7 clinical tests of motor competency (Dow & Moruzzi, 1958), were used to assess the participants' motor skills. These clinical tests assessed limb shake, hand declination, toe tapping, past pointing, balance time, weighting time and postural stability. Table 1 presents the three motor domains examined in this study and the corresponding 15 tests used per motor domain. The sum of the scores of the 15 tests per domain gave the total score for fine motor skills, gross motor skills, and balance respectively.

| MOTOR DOMAIN | TESTS | |
|---|---|---|
| | **MABC TESTS** | **CLINICAL TESTS** |
| **FINE MOTOR SKILLS** | Posting coins | Limb shake |
| | Bicycle trail | Hand declination |
| | Bead threading | |
| **GROSS MOTOR SKILLS** | Throwing ball into goal | Toe tapping |
| | Catching beanbag | Past pointing |
| | Jumping over cord | |
| **BALANCE** | One leg balance | Balance time |
| | Walking heels raised | Weighting time |
| | | Postural stability |

**Table 1:** Grouping of the motor tests used per motor domain

For each child, assessments took place individually in an empty school class; the duration of each assessment lasted between 30 and 40 minutes and the order of the administration of the tests was the same for all the children.

## Results

One-way univariate analysis of variance (ANOVA) was conducted to ascertain whether mean scores on the above-mentioned motor domains (fine motor skills, gross motor skills, and balance) differed significantly across the three groups. Scheffe's post–hoc test was undertaken in cases where a significant group difference was observed. Table 2 presents the mean and standard deviation on the fine motor skills, gross motor skills and balance scores for the 3 groups of participants, as well as the summary of the statistical analysis.

Statistical analysis revealed significant differences between the three groups in all the three domains (Table 2). Statistically significant differences were found between the three groups in fine motor skills ($F(2, 57) = 50.46$; $p < .01$). Post hoc comparisons indicated that fine motor skills score of the ASD group ($p < .01$) and the ID group ($p < .01$) differed from the TD group, but there were not significant differences between the ASD and the ID group.

| | ASD | | ID | | TD | | | |
|---|---|---|---|---|---|---|---|---|
| **DOMAIN** | **M** | **SD** | **M** | **SD** | **M** | **SD** | **F (2,57)** | **Scheffe Test** |
| **FINE MOTOR** | 0.62 | 0.73 | 0.22 | 0.61 | -0.85 | 0.62 | 50.46** | asd<td**<br>id<td** |
| **GROSS MOTOR** | 0.33 | 0.41 | -0.01 | 0.76 | -0.31 | 0.59 | 67.80* | asd<td*<br>asd<id**<br>id<td* |
| **BALANCE** | -0.04 | 0.53 | 0.16 | 0.45 | -0.15 | 0.37 | 297.59** | asd<td**<br>asd<id**<br>id<td** |

* $p < .05$ **$p < .01$

**Table 2:** Mean, standard deviation and summary of the statistical analysis for the three groups in terms of performance by motor domain

However, the three groups differed significantly in the gross motor skills ($F(2, 57) = 67.8$; $p < .01$) and balance scores ($F(2, 57) = 297.59$; $p < .01$) (Table 2). Scheffe's post–hoc test revealed that in these two domains children with ASD demonstrated statistically significant different performance compared to both the TD children and children with ID ($p < .01$). Additionally, post hoc comparisons showed the TD and ID groups differed significantly in the gross motor and balance domains ($p < .05$ and $p < .01$ respectively).

## Discussion and Conclusion

The aim of the present study was to examine the motor function of young children with ASD, aged 4 to 6 years, in comparison to two groups of age- and gender-matched intellectually disabled (ID) and typically developing (TD) children. Our findings showed significant differences between the three groups in three motor domains (fine motor skills, gross motor skills, and balance). Children with ASD presented statistically significant different performance compared to both the TD children and children with ID in all domains, and children with ID performed better than those with ASD in the gross motor and balance domains.

The present findings are in line with the results of previous studies which demonstrated that children with ASD present severe difficulties in motor skills compared to typically

developing children (Kaur et al., 2018; Odeh et al., 2022; Siaperas et al, 2012; Williams et al., 2012; Wilson et al., 2018). Our results are consistent with previous studies in which children with ASD showed lower performance compared to children with ID in tests evaluating balance and gross motor skills and these findings support the specificity of motor impairments in children with ASD (Stins & Emck, 2018; Whyatt & Craig, 2012; Zhou et al. (2020). Furthermore, our outcomes support the conclusion of a recent study suggesting that impairments in gross motor skills may be an independent predictor of autism severity (Zhou et al., 2020).

Given that the cerebellum is the neuroanatomical structure which coordinates skilled voluntary movements, and controls motor tone, posture, and gait, the motor deficits observed in people with ASD could possibly attributed to cerebellar dysfunction (Cundari et al., 2023). Several studies have shown that deviations in cerebellar function have extensive overlap with ASD symptomatology and both cerebellar dysfunction and ASD could impact on motor competency, social communication, language development, reading, working memory, executive function skills and on affect and emotional behavior (Andreou et al., 2007; Bhat, 2021; Kasselimis et al., 2008; Lord, 2020; Vlachos et al., 2007).

In conclusion, although impaired motor activity is not included in the diagnostic criteria of ASD, motor skill difficulties are often observed. The existing research evidence and the findings of the present study could contribute to a deeper understanding of the specific and subtle motor impairments in children with ASD and observed motor skill difficulties can serve as a marker for early diagnosis, and provide further justification for the inclusion of motor skill development in programmes of early intervention for children with ASD.

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# *Behavioral Assessment of Cerebellar Function in Preschool Children Diagnosed With Autism Spectrum Disorder*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
A large body of literature, including preclinical histopathology, genetic and neuroimaging studies has established the involvement of the cerebellar circuits in the physiopathology of Autism Spectrum Disorder (ASD). The aim of the present study was to assess at a behavioral level the cerebellar function of preschool children aged 4 to 6 years old with ASD, in comparison to a group of age-matched typically developing (TD) children. Seven clinical tests were administered to measure performance into three main areas of cerebellar function: maintenance of posture, hypotonia (reduced muscle tone), and complex movements. Our results showed that children with ASD performed significantly lower in 6 out of 7 cerebellar tests compared to TD children. These findings indicate that cerebellar-dependent motor behaviours are compromised in preschool children with a diagnosis of ASD. Our findings are consistent with previous studies supporting a general cerebellar dysfunction in children with ASD and indicate that these impairments can emerge and be detected as early as at the preschool period of development.

Keywords: Cerebellar Function, Autism, Motor Behavior

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## Introduction

The cerebellum is a large and highly sinuous structure of the nervous system consisting of two hemispheres, which are connected by a narrower fate, the vermis. Having reciprocal connections with different regions of the cerebral cortex, provides the substrate for cerebro-cerebellar communication about various behaviours (Schmahmann, 2001). Traditionally, it is regarded as the regulator of motor function, occupying a central role in movement coordination. However, in addition to its role as a motor area, more recent studies show that the cerebellum is also involved in the control of adaptive learning, visual-motor coordination, and in the last twenty years there has been particular interest in the role of the cerebellum in cognitive functions.

Several studies have brought to the fore the essential contribution of the cerebellum to the regulation of neurocognitive functions, directed by specific brain regions with which the cerebellum is reciprocally linked, such as speech, cognitive processing and emotional regulation (Andreou et al., 2007; Basson & Wingate, 2013; Becker & Stoodley, 2013; Kasselimis et al., 2008; Sveljio et al., 2014; Vlachos et al., 2007). With its uniform cortical architecture, the cerebellum's connectional specificity allows it to modulate a wide array of behaviors (Vlachos et al., 2007).

Emerging evidence implicates cerebellar abnormalities and/or dysfunction in several developmental disorders, including Autism Spectrum Disorder (ASD) (Sydnor & Aldinger, 2022, Vlachos, 2018), This disorder is manifested in poor social interaction, atypical language use, and repetitive behaviors (Amaral et al., 2018; Bailey et al., 1996).

The first neuroanatomical differentiation observed in the brain of individuals with ASD was smaller cerebellar hemispheres and the hypoplasia of the cerebellar vermis in lobes VI and VII (Courschesne et al., 1988). Since then, many studies have found cerebellar abnormalities in the brains of individuals with ASD. For example, D'Mello et al. (2015) reported reduced gray matter in lobe VII in individuals with autism and showed a correlation between this component and the severity of a number of behavioral and cognitive deficits. These deficits included difficulty in social interaction, communication, and an increased number of stereotypical behaviours.

Subsequent studies across various disciplines have consistently implicated cerebellar circuits in ASD's social cognition and pathophysiology (Mosconi et al., 2015). Numerous studies have demonstrated overlapping features between cerebellar dysfunction and ASD symptoms, affecting language development, reading, working memory, executive function, and emotional behavior (Andreou et al., 2007; Bhat, 2021; Geschwind, 2009; Lord, 2020; Vlachos et al., 2007). Recent research by Couto-Ovejero et al. (2023) has highlighted the cerebellum's role in emotional regulation in autism, suggesting that deficits in internal model calibration may underlie emotional dysregulation.

Overall, cerebellar deficits have been associated with ASD for over three decades. According to Hampson and Blatt (2015), the cerebellum is - if not the only one - one of the main structures that exhibits non-standard morphology and functionality in individuals with ASD and is responsible for differential functioning across a wide range of behaviours, including communication skills, social interaction, stereotypic/repetitive behaviours, motor coordination and higher cognitive processes. This study aims to evaluate cerebellar function

in preschool children with ASD compared to age-matched typically developing children at a behavioral level.

## Methods

### *Participants*

A total of 40 children took part in this study. Twenty children, diagnosed with Autism Spectrum Disorder (ASD) according to the DSM-V criteria, with a mean age of 4.51 (SD = .06), were paired with 20 typically developing children (TD) matched for age and gender, with a mean age of 4.70 (SD = .08). All participants were enrolled in preschool education centers in North Greece at the time of data collection.

### *Materials & Procedure*

All participants underwent assessment which consisted of seven clinical tests (Dow & Moruzzi, 1958) designed to evaluate three main areas of cerebellar function: a) maintenance of posture, b) hypotonia (reduced muscle tone), and c) complex movements (Fawcett et al., 1996). Specifically, these tests evaluated: 1) limb shake, 2) hand declination, 3) balance time, 4) postural stability, 5) weighting time, 6) past pointing, and 7) toe tapping. The abovementioned tests were administered at the children's schools by a trained researcher. Each child was assessed separately in a classroom setting, with each procedure lasting between 20 and 30 minutes, following the same test administration order.

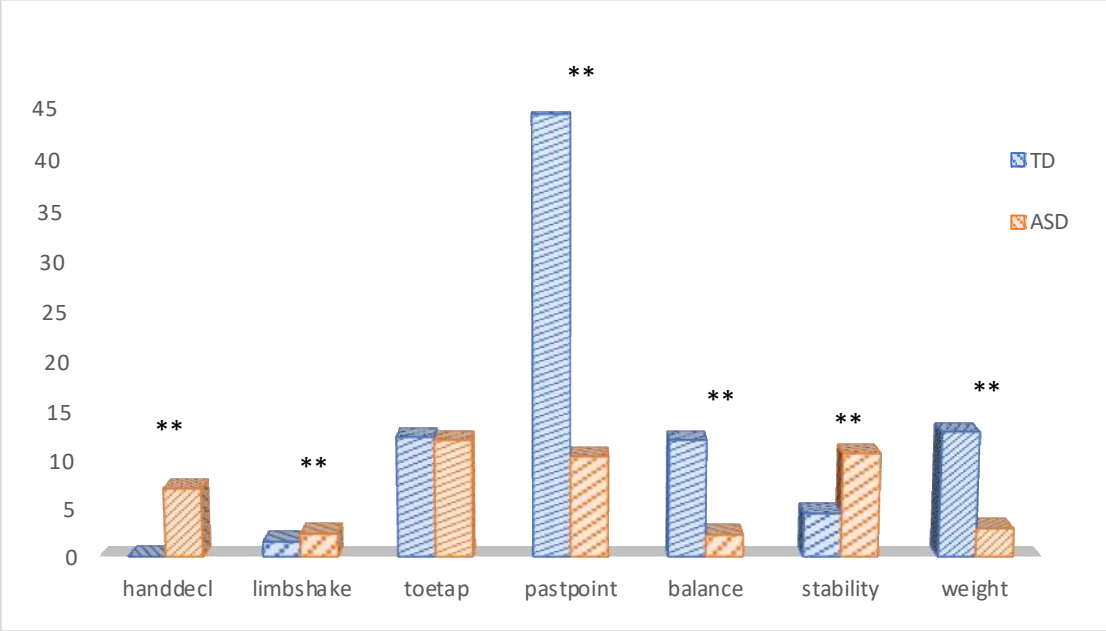
### *Data Analysis*

Data analysis was conducted using SPSS for Windows 25.0. A series of one-way univariate analysis of variance (ANOVA) tests were performed to ascertain whether mean scores on the above-mentioned cerebellar tests differed significantly across the three groups. Sheffe's post–hoc tests were undertaken whenever significant group differences were detected.

## Results

Group performance means and standard deviations on the seven cerebellar tests for the two groups of participants are presented graphically in Figure 1. Children with ASD performed significantly lower in 6 out of 7 cerebellar tests namely hand declination, limb shake, past pointing, balance time, postural stability and weighting time compared to children with TD (Figure 1).

More specifically, the group of children with ASD showed statistically significant lower scores than the TD children in six clinical tests: limb shake ($F_{2,57} = 23.34$; $p < 0.01$), hand declination ($F_{2,57} = 6.92$; $p < 0.01$), past pointing ($F_{2,57} = 183.23$; $p < 0.01$), balance time ($F_{2,57} = 895.55$; $p < 0.01$), postural stability ($F_{2,57} = 271.17$; $p < 0.01$) and weighting time ($F_{2,5\ 7} = 38.70$; $p < 0.01$). The toe topping test was the only test where statistically significant differences were not found between the two groups ($F_{2,57} = 1.68$; $p = 0.9$).




***p<0.01*

**Figure 1:** Performance of the TD and ASD children on the 7 cerebellar tests

## Discussion & Conclusions

This study aimed to assess the cerebellar function of preschool children diagnosed with autism spectrum disorder (ASD) compared to typically developing children, focusing on behavioral aspects. Our findings indicate compromised cerebellar-dependent motor behaviors -specifically, maintenance of posture, hypotonia, and complex movements-in preschoolers with ASD. This aligns with previous research demonstrating deficits in tasks related to cerebellar function in individuals with ASD, suggesting a partial contribution of cerebellar dysfunction to ASD symptoms (Cundari et al., 2023).

Consistent with existing literature, our study supports the notion of general cerebellar dysfunction in children with ASD (Bhat, 2021; Craig et al., 2018). Our results are also in line with neuroanatomical studies which reported significantly larger total cerebellar and cerebellar white matter volumes in young children with ASD compared to typically developing controls, suggesting early alterations in cerebellar development (Sparks et al., 2002; Courchesne et al., 2001). Recent research extends these findings to younger ages, indicating that familial risk of ASD may impact cerebellar development as early as 4-6 months of age (Pote et al., 2019). Additionally, reduced total cerebellar white matter volume was also observed in preschool children with ASD (Lucibello et al., 2019). These findings suggest that early neuroanatomical alterations, dysfunction, or damage to the cerebellum may have lasting effects on movement, cognition, and emotional regulation.

While cerebellar dysfunction likely contributes to ASD symptoms, it is not necessarily the primary cause of ASD. Rather, the cerebellum likely plays an important role in the neural alterations associated with ASD. Further neuroimaging studies are needed to elucidate the cerebellum's role in both typical and atypical behavior and cognitive functioning.

Based on the evidence reported in the present study, we suggest including assessment of cerebellar function in ASD diagnosis protocols, with reported deficits considered as one of

the criteria for early ASD diagnosis. Early intervention targeting motor, cognitive, and social skills is crucial for promoting developmental milestones and reducing symptom severity in children with ASD (Geschwind et al., 2009; Hirata, 2014).

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# *Enhancing Resilience and Work Effort Through Mindfulness-Acceptance-Commitment Group Counseling in Professional Football Players*

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The Asian Conference on Psychology & the Behavioral Sciences 2024
Official Conference Proceedings

**Abstract**
This study investigates the impact of Mindfulness-Acceptance-Commitment (MAC) group counseling on resilience and work effort in a cohort of 30 professional football players. Pre-test and post-test measures utilizing validated resilience and work effort scales were employed to assess changes in participants' psychological well-being and performance-related attributes. The intervention comprised 10 sessions of MAC group counseling, focusing on mindfulness-based practices, acceptance of thoughts and emotions, and commitment to personal values. The study aimed to explore whether the MAC group counseling could effectively enhance resilience and work effort in professional football players, given the unique stressors and demands associated with their high-performance careers. Results indicated a significant improvement in both resilience and work effort scores following the completion of the MAC group counseling. The findings suggest that the tailored intervention positively influenced participants' ability to bounce back from adversity and exert sustained effort towards their professional goals. The observed increase in resilience and work effort scores underscores the potential efficacy of mindfulness-based interventions in fostering mental resilience and optimizing performance outcomes in elite sports settings. This research contributes to the growing body of literature on mental health and performance enhancement strategies for athletes, particularly within the context of professional football. The implications of these findings extend beyond the field of sports psychology, emphasizing the relevance of mindfulness and acceptance-based approaches in promoting well-being and work-related outcomes in high-stakes, high-demand environments.

Keywords: Resilience, Work Effort, Professional Football Player, Mindfulness-Acceptance-Commitment Approach, Group Counseling

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## Introduction

Sports Psychology has emerged as a crucial component in understanding and enhancing athletic performance in competitive sports. Anderson et al. (2014) considered its significance, highlighting its role as a cornerstone in achieving success in sports. Within this multifaceted field, researchers have delved into various psychological characteristics deemed essential for athletes striving for excellence. Among these characteristics, resilience and work effort have garnered significant attention. Beauchamp et al. (2021) emphasized the paramount importance of resilience and work effort in professional athletes. These psychological traits serve as indispensable tools, enabling athletes to navigate the formidable challenges and pressures inherent in competitive sports. In the face of adversity, resilience empowers athletes to adapt, thrive, and bounce back quickly after adversities or difficult times (Yun-Ci Ye et al., 2022), while unwavering work effort fosters sustained dedication and perseverance towards their goals (Elangovan, 2010). Moreover, the integration of mindfulness practices has been applied to sports psychology, offering a holistic approach to optimizing athletic performance. Gardner and Moore (2012) introduced mindfulness as a pivotal concept in enhancing peak performance and achieving success in competitive sports. By cultivating present-moment awareness and mental clarity, mindfulness equips athletes with the cognitive tools necessary to excel under pressure, maintain focus, and regulate emotions during the intensity of competition. Furthermore, building upon the foundation of mindfulness, Moore (2009) introduced the Mindfulness-Acceptance-Commitment (MAC) approach as a specialized intervention tailored to the unique demands of competitive sports. This innovative methodology emphasizes acceptance of thoughts and emotions, coupled with a commitment to personal-valued actions, thereby empowering athletes to harness their mental faculties effectively in pursuit of peak performance (Beauchamp et al., 2021). In addition to individualized interventions, group counseling has emerged as a potent adjunct in sports psychology. Group counseling sessions provide athletes with a supportive environment for collective exploration, mutual learning, and shared coping strategies. Through these collaborative endeavors, athletes can enhance their resilience and work effort by drawing inspiration from peers, receiving constructive feedback, and fostering a sense of solidarity. In light of these seminal contributions, this paper aims to delve deeper into the intricate interplay between psychological factors such as resilience, work effort, and mindfulness, and their profound impact on sports performance (Josefsson et al., 2019). By elucidating the underlying mechanisms and practical implications of these psychological constructs, this research endeavors to provide valuable insights into the holistic development of athletes and the optimization of their competitive prowess. The research question is the Mindfulness-Acceptance-Commitment group counseling affects resilience and work effort among professional football players. The objective of the research is to investigate the effect of Mindfulness-Acceptance-Commitment group counseling on enhancing resilience and work effort among professional football players.

## Method

### Participants

The population was 60 professional football players in Chainat province, Thailand. The sample consisted of 30 players of professional football players in Chainat province, divided into 15 professional football players in an experimental group and 15 professional football players in a control group. And 15 professional football players of an experimental group

were willingto participate in the 10 sessions of the Mindfulness-Acceptance-Commitment (MAC) group counseling.

## Instrumentation

### *Scales*

#### *The Resilience Scale*

The resilience of the participants was measured using the Connor-Davidson Resilience scale (CD-RISC) (Campbell-Sills & Stein, 2007). The resilience scale of Connor & Davidson (2003) was revised to be the original 25-item scale. The scale is rated on a 4-point Likert scale (1-4), Responses on the scale were the participants with higher scores reflecting greater resilience level of the participants (Gucciardi et al., 2011).

#### *The Work Effort Scale*

The measurement of Work Effort was conducted by improving the Work Effort Scale from the framework proposed by De Cooman et al. (2009), comprising a 9-item scale. Responses on the scale were the participants with higher scores reflected greater Work Effort level of the participants.

### *Intervention*

#### *Mindfulness-Acceptance-Commitment (MAC) Group Counseling*

The Mindfulness-Acceptance-Commitment (MAC) was developed from the original of Gardner and Moore (2007) to be 10 sessions of the Mindfulness-Acceptance-Commitment (MAC) group counseling for 50 minutes per session to improve 3 components leading to enhance Resilience and Work Effort of professional football players i.e. 1) Mindfulness 2) Acceptance and 3) Commitment. The Mindfulness-Acceptance-Commitment (MAC) was driven by a flexible 7-module protocol.

The outline of the Mindfulness-Acceptance-Commitment (MAC) includes;

1) Psycho-education
2) Mindfulness and Cognitive Defusion
3) Value and Value-driven Behavior
4) Acceptance
5) Commitment
6) Skill Consolidation and Poise-Combining Mindfulness, Acceptance, and Commitment
7) Maintaining and Enhancing Mindfulness, Acceptance, and Commitment

### *Procedures*

This study was a quantitative quasi-experimental research design with the control group and the experimental group to investigate the effect of Mindfulness-Acceptance-Commitment group counseling. The granted ethical has been approved for research conducted in humans, number **SWUEC672067**. The researcher contacted the Chainat Hornbill Football Club's manager to initiate the study. After the approval, the Chainat Hornbill Football Club's staff assisted in collecting the Resilience Scale and Work Effort Scale data from 30 professional football players for pre-test measure. All professional football players have been divided into 15 professional football players for an experimental group and 15 professional football players for a control group. The appointment of the Mindfulness-Acceptance-Commitment

(MAC) group counseling within 10 sessions was made for the experimental group members to enhance Resilience and Work Effort. In the end, the 30 professional football players from the experimental group and the control group were conducted for post-test measure of Resilience and Work Effort after the session had ended.

## Results

The study aimed to investigate the effects of a Mindfulness-Acceptance-Commitment (MAC) group counseling intervention on resilience and work effort among professional football players, comparing an experimental group ($n$=15) with a control group ($n$=15).

Table 1. Participant Demographics and Positions in Experimental and Control Groups ($n$ = 30)

| Demographic | Group | |
|---|---|---|
| | Experimental ($n$=15) | Control ($n$=15) |
| Age (years) | | |
| 19 - 24 | 13 | 8 |
| 25 - 29 | 2 | 2 |
| 30 - 35 | - | 4 |
| 36 - 41 | - | 1 |
| *Mean±SD* | 21.87±2.13 | 26.13±6.06 |
| Position | | |
| Goalkeeper | 1 | 3 |
| Defender | 6 | 4 |
| Midfielder | 6 | 4 |
| Forward | 2 | 4 |

Demographic Characteristics: The experimental group predominantly consisted of participants aged 19-24 years, with 13 individuals falling within this age range. Conversely, the control group displayed a broader age distribution, encompassing participants across all age categories. The mean age of the experimental group was 21.87 years (SD=2.13), while the control group had a mean age of 26.13 years (SD=6.06).

Positional distribution: In both the experimental and control groups, midfielders and defenders constituted the majority of players. Specifically, 6 participants in each group assumed midfield positions, and 6 participants in each group played as defenders. The goalkeeper position was occupied by 1 participant in the experimental group and 3 participants in the control group, 2 participant in the experimental group and 4 participants in the control group were positioned as forwards.

Table 2. Comparison of Resilience and Work Effort Scores Before and After Intervention in Experimental and Control Groups

| | Group | | *D* | *t* | *p-value* |
|---|---|---|---|---|---|
| | Experimental (*n*=15) | Control (*n*=15) | | | |
| Resilience | | | | | |
| Pre-test | 71.40±3.29 | 72.33±2.58 | -0.93 | .86 | .395 |
| Post-test | 78.8±2.93 | 73.13±2.32 | 5.67 | 5.86 | .000* |
| Work Effort | | | | | |
| Pre-test | 25.86±1.30 | 26.66±.89 | -0.8 | 1.94 | .060 |
| Post-test | 28.6±1.12 | 26.86±1.06 | 1.74 | 4.35 | .000* |

*$p < .05$

### *Resilience*

Prior to the intervention, there were no significant differences in resilience scores between the experimental group ($M = 71.40$, $SD = 3.29$) and the control group ($M = 72.3$, $SD = 2.58$), with a non-significant t-value ($t = .86$, $p = .395$). However, following the intervention, a notable change was observed. The experimental group exhibited a significant increase in resilience scores ($M = 78.8$, $SD = 2.93$), while the control group's scores remained relatively stable ($M = 73.13$, $SD = 2.32$). The difference in post-test resilience scores between the two groups was statistically significant ($t = 5.86$, $p = .000$*), indicating that the MAC group counseling intervention had a significant impact on enhancing resilience among professional football players compared to the control group.

### *Work Effort*

Before the intervention, there were no significant differences in work effort scores between the experimental ($M = 25.86$, $SD = 1.30$) and control groups ($M = 26.66$, $SD = .89$), as indicated by a non-significant t-value ($t = 1.94$, $p = .060$). However, post-intervention, both groups exhibited significant changes in work effort scores. The experimental group demonstrated a substantial increase ($M = 28.6$, $SD = 1.12$), while the control group showed a modest increase ($M = 26.86$, $SD = 1.06$). The difference in post-test work effort scores between the two groups was statistically significant ($t = 4.35$, $P = .000$*), indicating a significant improvement in work effort for the experimental group compared to the control group.

## Discussion and Conclusion

Sports psychology plays a crucial role in understanding and optimizing athletic performance, particularly in competitive sports settings. Resilience, work effort, and mindfulness are recognized as important psychological factors that contribute to athletes' ability to cope with challenges and attain success (Anderson et al., 2014). In this study, we aimed to investigate the effect of Mindfulness-Acceptance-Commitment (MAC) group counseling on resilience among professional football players, building upon the existing literature that underscores the importance of these psychological constructs in sports performance (Gardner and Moore, 2012). Our findings reveal a significant difference in post-test scores for resilience between the experimental and control groups. Participants who participated in MAC group counseling

exhibited notably higher levels of resilience compared to those who did not receive the intervention. This aligns with previous research highlighting the efficacy of mindfulness-based interventions in enhancing psychological well-being and performance outcomes in various domains, including sports (Gardner & Moore, 2012; Moore, 2009). The observed increase in resilience among participants in the experimental group can be attributed to the unique components of the MAC approach, which emphasizes mindfulness, acceptance, and commitment to valued actions. By fostering present-moment awareness, acceptance of thoughts and emotions, and alignment with personal values, MAC group counseling equips athletes with the cognitive and emotional tools necessary to navigate adversity, manage stress, and maintain focus on the demands of competitive sports (Josefsson et al., 2019). These findings underscore the practical implications of integrating mindfulness-based interventions, such as MAC group counseling, into athlete development programs. By targeting psychological factors such as resilience, MAC interventions offer a holistic approach to optimizing sports performance and promoting athletes' overall well-being. Furthermore, the effectiveness of MAC group counseling in enhancing resilience among professional football players highlights its potential applicability across diverse athletic populations and contexts. However, it is essential to acknowledge certain limitations of the present study. Firstly, the sample size and specific characteristics of the participants may limit the generalization of the findings to broader athlete populations. Additionally, the study design employed a post-test-only control group design, which precludes the establishment of causality. Future research could benefit from longitudinal designs and larger sample sizes to further elucidate the long-term effects of MAC interventions on resilience and other performance-related outcomes in sports. In conclusion, our study contributes to the growing body of literature on sports psychology by demonstrating the efficacy of mindfulness-based interventions, such as MAC group counseling, in enhancing resilience among professional football players. By addressing the psychological needs of athletes and equipping them with strategies to thrive in the face of adversity, MAC interventions hold promise for optimizing sports performance and promoting athletes' overall well-being in competitive sports settings. For future research, longitudinal studies should be conducted to assess the sustained effects of MAC group counseling on resilience and performance outcomes among professional football players. Additionally, exploring the applicability and effectiveness of MAC interventions across diverse athlete populations and sports contexts could provide valuable insights. Comparative studies comparing MAC interventions with other psychological approaches would help elucidate their unique contributions to resilience and performance. Investigating the psychological mechanisms underlying the effects of MAC interventions on athletes through qualitative or process-oriented research designs are essential.

## Acknowledgments

We would like to thank the Graduate School of Srinakharinwirot University for partial funding (GRAD S-3-67), and the Chainat Hornbill Football Club for providing the venue and ensuring our comfort during the program implementation.

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