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Influence of Normative Models on Social Representations: The Case of 30kph Zones

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Abstract
Our research fit into social representations' framework (Moscovici, 1961), defined by Jodelet (1997) as "modalities of practical thought orientated towards the communication, comprehension and control of the social, material and conceptual environment". We are especially interested in the influence of normative models in the field of social representations (Flament, 1999; Gaymard, 2009). To the demand of Angers' city (France) which is financing this study and wishing to promote the emergence of a culture of public space sharing, we focus on one of measures they are using in this initiative: 30kph zones. We seek to determinate the part of different models (especially friends' and parents' models) in the speech of young drivers. We submitted a questionnaire on the 30kph zones representation to 32 young drivers. They had to answer in their name, but also as they think their parents, their friends and drivers in general, would do. An analysis of multiple linear regression shows the influence of parental model on the answers of young people. So, with regards to the 30kph zones, representations and practices of young drivers fall more within parental model than peer's model. These results are discussed in comparison with anterior studies realized with an identical population.

Keywords: social representations, normative models, influence, road safety, zones at 30kph

Framework

This study fits into the framework of social representations (Moscovici, 1961) and more specifically the structural approach of social representations (Abric, 1976; Flament, 1987). Social representations are a social way of thinking and seem like a form of common sense knowledge (Jodelet, 1991). Social representations emerge and evolve in communication processes and interpersonal relationships (Moscovici, 1961). They are related to conditional practices (Flament, 1994; Gaymard, 2014).

The study of normative aspects has revealed the importance of reference models in social representation (Flament, 1999, 2001 ; Gaymard, 2003, 2009 ; Gaymard & Andrés, 2009 ; Gaymard & Bessin, 2014). This research highlights the weight of certain models such as the models of teachers, peers or parents. Thus Flament (1999), when studying the social representation of higher education among a student population, showed that students' answers were more influenced by the models "well thought of by the parents" and "well thought of by the teacher". Gaymard (2003) showed that female Franco-maghrebian students in a negotiating situation were influenced by the model "well thought of by their parents". Gaymard (2009) showed that young motorists are influenced by their peers in their relation with speed. Gaymard & Bessin (2014) demonstrated that young teenage moped riders are closer to risk-taking than to safety and that this is esteemed by their peers. Nevertheless, in some aspects, the parental model weighs on the teenage moped-drivers' representation.

The study of normative aspects in the field of social representations has also led to the elaboration of the conditionality theory (Gaymard, 2014). In the field of road transport, for example, studies showed the role of conditionality in the young drivers' representation of driving (Gaymard, 2007, 2009) but also in comparison with elderly people (Gaymard, Allain, Osiurak & Le Gall, 2011). The respect towards pedestrians likewise appears conditional (Gaymard & Tiplica, 2012, 2014).

In this study, the question focuses on urban mobility and the appearance of new measures such as zones at 30kph, which implies the emergence of new representations (Bordarie & Gaymard, submitted; Gaymard & Bordarie, 2014a, 2014b). Here, we look into reference models: friends, parents, motorists in general, and their impact on the young drivers' representation of the zones at 30kph.

Hypothesis

Considering the results of previous studies, it can be thought that young drivers should be influenced by the model of peers.

Method

Tool

We created a questionnaire starting from a first study of social representation of 30 zones. This questionnaire includes 15 binary proposals associated with driving at 30kph. For example, we proposed "*driving at 30kph is for safety*" vs. "*driving at 30kph does not solve the safety problems*" or "*driving at 30kph is useful*" vs. "*driving at 30kph is useless*".

Instruction

"*For every binary proposal concerning driving at 30kph, check the proposal which corresponds most to what you think. Then, check the one that you think motorists in general would check, as well as the one that your friends would check, and that your parents would check*".

Population

Our population is composed of 57 young drivers (average age=19.05; SD=0.91) with 80% women and 20% men. All are French students in the first year of psychology.

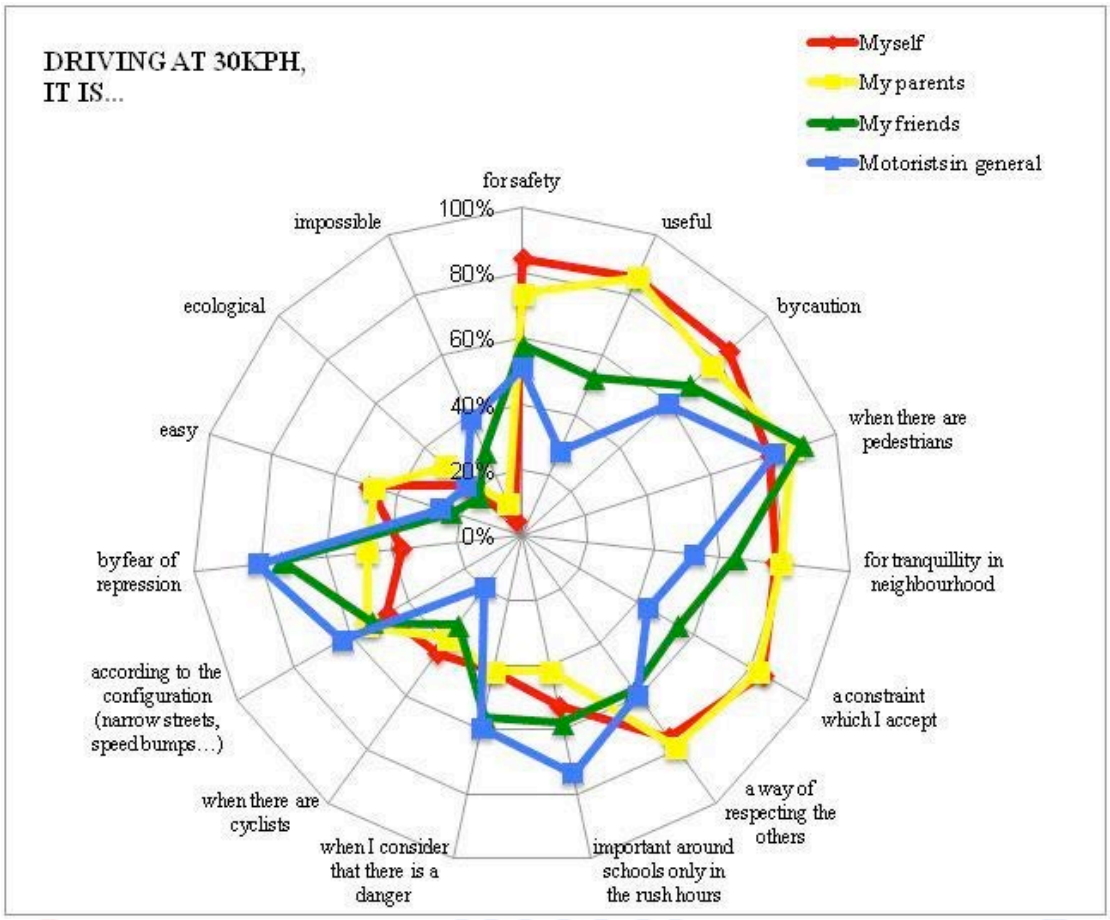
Analysis

We performed a linear regression analysis to highlight which model is the most predictable of the subject's answers.

Results

The graph shows the curves of the subjects' answers and the one of each reference model for each proposal (we only present one of the two proposals for every pair). We observe (Graph 1) that the curve of the subjects' answers (red) draws closer to the parents' curve (yellow). It can also be seen that the friends' curve (green) is closer to the motorists' curve (blue).

In a first step, we analyze the subjects' social representation of 30 zones. We observe that the zones at 30kph and the fact of driving at 30kph are a useful action related to the necessary safety and caution. It seems that students match 30kph with the presence of pedestrians, tranquillity in the neighbourhood or also with the notion of respect for others. This speed limit is an accepted and understood constraint, which does not appear impossible to comply with. There is a consensus among the population about the fact that this speed limit is not a result of environment-friendly behavior. On the other hand, conflicts can be seen in the representation of 30kph because a part of our population considers that driving at 30kph is not easy and is not linked to the fear of repression. Furthermore, students are divided about the presence of cyclists as a condition for driving at 30kph. A certain number of them say that they drive at 30kph when they consider that there is a danger or near a school when school starts or finishes.



Graph 1: Representation of subjects' answers to "Driving at 30kph, it is…"

If the students' curve follows the parents' curve, it is noteworthy that the friends' curve and the motorists' curve are closer to each other, but very different from the curve of the students' answers. This means that there is a difference between the students' representation and the one they think their friends or motorists in general have. Linear regression analysis confirms this idea and reveals that the parental model is the most predictive of the young drivers' models.

Table 1. Regression analysis

Model	Unstandardized coefficients		Standardized coefficients	Sig.	r2
Variable	B	Std. Error	Bêta	Pr > t	
Constant	-0,414	3,816		0,916	0,935
Parents	1,048*	0,159	0,966	**0,000**	
Friends	0,037	0,338	0,028	0,916	
Motorists in general	-0,088	0,255	-0,070	0,736	

*. Significant at .001

Discussion

This study is interesting from several points of view. The first of them is the orientation of the results which could appear to be a new consideration concerning the influence of normative models in the field of road safety. Unlike the speed limit (Gaymard, 2009) the representation of zones at 30kph does not appear to be influenced by the peers' model, but by the parental model. Until now, research has highlighted the greater role of the peers' model in relation to the respect or transgression of laws and traffic regulation. However, our results highlight the role of the parents' model more than any other model. It can be seen that they think 30kph is mainly for safety. On the other hand, when they talk for their friends, the results reveal that peers drive at 30kph above all from fear of repression or when there are pedestrians in the public space. In these two conditions, we have a potentially dangerous condition (presence of pedestrians) and a condition which is explained by the fear of losing one's driving license or fear of repression. This last condition illustrates the role of repression in following the highway code for young drivers.

Several explanations can be put forward. It is possible that social desirability comes out in these results owing to the university context of the survey. In our case, people were invited to answer the questionnaire in front of the researcher who was also the teacher of the course. In this situation, the researcher-teacher embodies a certain form of "law" or an adult to please. It can be imagined that students wanted him to be pleased with their answers. Thus it is possible that they answered the questionnaire to be well thought of by the teacher. The differences with the other young people and motorists in general suggest they consider themselves more aware of the importance of safety for 30 zones, which can be a bias of self-enhancement. It is also possible to have a sample of specific young motorists who identify more with their parents than their peers for other objects. Moreover in the sample, there is a strong imbalance between females and males and we know that females are more law-abiding (Axa Prévention, 2013) and have fewer fatal accidents than men. Indeed, during the year 2013, 77% of deaths as a result of a road accident were men, against only 23% women. It is also possible that the object 30kph is too normative in that it greatly induces respect (unlike speeding). Finally the method used is not strictly the usual analysis method (Flament, 1999; Gaymard, 2003, 2009). Consequently in a further study these different elements should be taken more into consideration.

With regard to public policies, it is therefore important to communicate about the safety of vulnerable users in zones at 30kph and about the aim of sharing public space (Gaymard & Bordarie, 2014a, 2014b).

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Experiencing the Perspective of the Other: Stanley Milgram's Cyranoid Method as a Means of Exploring Alternative Identities

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Abstract
Barriers to understanding and cooperation arise when we fail to take the perspective of the other people in our lives. But there are certain fundamental limits regarding the extent to which it is possible to take an alternative perspective or imagine someone else's first-person point-of-view. As much as we can empathize with others on the basis of shared experiences, we only ever directly experience ourselves, and resort to the powers of the imagination in order to place ourselves (metaphorically) in somebody else's shoes. Social psychologist Stanley Milgram, however, developed a clever means of accessing the first-person perspective of another social agent: the "cyranoid method." The technique entails constructing hybrid social agents ("cyranoids") composed of the "mind" (a.k.a. the "source") of one person and the "body" (a.k.a. the "shadower") of another. Via an audio-vocal procedure known as speech shadowing, sources control the verbal communication of shadowers while interacting face-to-face with other agents in various social environments. Cyranic contraptions allow people to experience the same social context through a variety of differentiated external identities to gain better understanding as to the relationship between identity and social behavior. I argue in the following paper that the cyranoid technique is particularly powerful as an experiential learning tool that enables research participants to creatively explore the first-person perspective of persons whose external identities differ from their own.

Keywords: Cyranoid, Milgram, person perception, embodiment, experimental methodology, perspective-taking

Introduction

In the late 1970s, American psychologist Stanley Milgram - who had risen to prominence in the decade prior for his controversial but impactful research on obedience to authority (Milgram, 1963, 1974) - began piloting an experimental procedure that enabled separate social actors the ability to function as a single interactive unit: a "cyranoid." Employing a vocal technique known as speech shadowing (see Marslen-Wilson, 1973; Schwitzgebel & Taylor, 1980), he trained research confederates to replicate the spontaneous prose produced by remote third-parties using covert audio-relay while in dialogue with naïve interlocutors (essentially, a "bug-in-the-ear" technique; see Gordon, 1975). The impetus for exploring such a transformed type of social interaction was inspired by the fictional account of the character Cyrano from Edmund Rostand's 19th century play *Cyrano de Bergerac* (trans, 1981). In the play, Cyrano, a poetic but unattractive romantic, provides prose to the physically handsome but linguistically dull Christian, who in turn speaks Cyrano's words to the object of their joint affection: the beautiful Roxane. Roxane subsequently falls in love with the mind of Cyrano and the body of Christian. Milgram's view was that these and other mind-body fusion fantasies illuminated the nature of the social self and the intimate relationship between physical appearance and person perception.

Milgram never formally reported any of his work with cyranoids. The most substantive published evidence of his applications of the cyranoid method appears in the form of a transcribed speech he prepared for an American Psychological Association (APA) conference shortly before his death in 1984 (Milgram, 2010). In the speech he describes two studies: one in which he explored adult-adult cyranoid pairs, and another in which he tested the possibility of incongruent cyranoid hybrids, pairing 11- and 12-year-old speech shadowers with words generated by an adult (Milgram) during dialogue with panels of teachers naïve to the deception. In both experiments, subjects who communicated with a cyranoid failed to detect that their conversation partner was simply repeating words emanating from a separate, unseen person. Milgram subsequently referred to this phenomenon as the "cyranic illusion," describing it as a person's persistent willingness to ascribe communicative autonomy to individuals even in circumstances involving apparent discrepancies between the dispositional elements of an interlocutor (i.e., their inner character as suggested by the words they produce) and their physical nature (e.g., age, gender, appearance, etc.).

The technique

Speech shadowing in one's native language is relatively simple. In a basic shadowing exercise, one person, the "shadower," wears an inner-ear device that receives communication from a "source." A source can be a spontaneously speaking third-party, an audio recording, or any other conceivable generator of linguistic communication (e.g., a computer program designed to generate human-like speech). As the shadower hears the source's communication, he or she attempts to repeat the message verbatim. Skilled speech shadowers can achieve latencies as low as several hundred milliseconds (Marslen-Wilson, 1985), and shadowers tend to mimic the gestural idiosyncrasies of their source (Pardo, Jordan, Mallari, Scanlon, & Lewandowski, 2013), capacities that contribute to the illusion that a speech shadower is self-generating the words they produce. Combining a source with a separate

shadower creates a hybrid agent of sorts: the "mind" of one person fused with the "body" of another. A cyranoid.

Creating a mobile, covert cyranoid capable of socially interacting with others requires utilizing a basic amalgam of simple gadgetry (detailed overviews of which can be found in Corti & Gillespie, 2014; as well as in Mitchell, Gillespie, & O'Neill, 2011). In a basic apparatus, the shadower wears a discreet wireless inner-ear radio receiver that picks up audio from a signal transmitted by the source. This can be facilitated using a microphone connected to a FM transmitter. Such a contraption allows the cyranoid the ability to freely maneuver among "interactants" (Milgram's term for research subjects who engage with a cyranoid) without compromising the experimental deception. Audio as well as video of the shadower's field of vision can be transmitted to the source via either hidden or overt recording devices. In this manner, a source can observe and listen to interactant communication and reply via the shadower in real-time.

The utility of such a method: Exploring alternative identities

Sourcing for a shadower approximates "stepping into the shoes" of another person, allowing one to experience social interactions as though one had the body of a different human being. The methodology runs parallel to analogous first-person means of assuming an alternate physical social persona such as the online digital platform Second Life, wherein users may control customized avatars and gain a sense of how intersubjectivity unfolds in relation to certain characteristics of one's outer appearance (see Boellstorff 2008; Dumitrica & Gaden, 2009). Immersive virtual environment technologies have also been employed by researchers to further understand the relationship between transformed outer identity, self-perception, and social behavior (see "the Proteus effect": Yee & Bailenson, 2007). The key features of these technologies are that they allow for interactive research wherein subjects may manoeuvre within a particular social environment relatively unconstrained, as well as allow for levels of mundane realism well beyond those achieved by more traditional means of social psychological experimentation that demonstrate behavioral confirmation and related phenomena by use of static experimental stimuli (e.g., "paper people": see Murphy, Herr, Lockhart, & Maguire, 1986; for a discussion of these methods in relation to mundane realism, see Blascovich et al., 2002). The cyranoid technique brings these concepts of hybridity and transformed social identity into the realm of actual (i.e., non-virtual) human-human interactions. Cyranoid-interactant interactions are face-to-face encounters involving real human beings as stimuli, and in that sense come much closer to simulating the realism of real-world social encounters.

Corti and Gillespie (2014) provide a replication of the unpublished cyranoid studies Milgram describes in his 1984 APA speech. Their first study explored whether research subjects would detect when a male confederate was speech shadowing for a female source during face-to-face interlocution (relative to a control condition in which the male confederate spoke autonomously), and their second study explored Milgram's interview scenario wherein an adult confederate and a child confederate alternated sourcing and shadowing for one another during discussions with panels of research participants (naïve to the deception) tasked with assessing their intellectual capabilities. Even in this later scenario, wherein the component identities of the

cyranoid were vastly incongruent with one another, interactants still made sense of their interlocutor as though they were an autonomously communicating individual. This allowed the researchers to gauge to what extent the physical persona of the cyranoid shaped the nature of the research subjects' contributions to the dialogue as well as how the source's behavior changed in relation to the outer identity they communicated through. The findings of these studies point to a number of applications of the method spanning a variety of behavioral science domains.

Thus, the cyranoid method has vast potential as a first-person tool for studying social perception and related behavioral confirmation phenomena. For instance, we can imagine having a controlled source author words for a variety of physically-distinct shadowers across experimental conditions encompassing a certain social scenario while observing how the behavior and attributions of interactants change in relation to their stereotyped assumptions of the cyranoid they encounter. In this manner a single individual (the source) could experience a "landscape" of possible identities within the same social frame, gaining a sense of how their social world responds differently on the basis of the physical persona they embody. For example, Choi (2012) used the method to directly experience corporate interviews through the bodies of male and female candidates, while Corti (2012) used age-differentiated shadowers to experience social persuasion scenarios.

Cyranoids may also be used as a means of exploring alternative identities in the classroom. In a study undertaken by Mitchell (2010), teachers sourced for adolescent speech shadowers during classroom learning exercises, affording students the ability to participate in instructing their peers on new course material. Mitchell suggests that such applications of the cyranoid method may serve to scaffold children's presentation and social skills, as well as enliven the classroom environment through engaging students in the act of teaching.

Conclusion

For the researcher interested in how physical identity and social perception impact behavior, the cyranoid method affords the opportunity to study these and related phenomena in a highly dynamic and interactive way. The method is particularly apt for exploring firsthand the nature of physical identity and its role in eliciting the social world one encounters. It is indeed a worthy and long overdue addition to the social psychologist's repertoire of approaches to understanding person perception and the nature of the social self.

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The Influence of Affordance on Cognitive Workload

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Abstract
In the study, it was demonstrated that whether there was a difference between an affordance condition and a no-affordance condition in the aspect of negative compatibility effect and cognitive workload. In case of the negative compatibility effect, even though the object's orientation and arrow's orientation are corresponded, when a prime object is displayed very briefly motor system is inhibited.

Twenty five students volunteered to participate in the experiment. The experimental design was 2 (Affordance condition & No-affordance design) X2 (Congruence & Incongruence) X2 (Task difficulty: High & Low), within subject design. Using RSVP paradigm, first of all, object stimuli presenting for 70ms is followed by arrow's orientations which are right or left for 70ms. As soon as arrow is presented, participants should respond arrow's orientation with keyboard. After then participants memorize numbers, 2-digit numbers or 3-digit numbers for 3500ms or 500ms. Cognitive memory task follows 2-digit numbers or 3-digit numbers. In the last section, subjects are asked subjective effort induced by memory task. Totally 192 trials are repeated randomly.

As a result, Negative Compatibility Effect was showed in the affordance and the congruent conditions by a difference between reaction time, not error rates. However, in case of cognitive memory task there are no differences in both of the affordance conditions and the congruent conditions. Therefore, it was confirmed that the Negative Compatibility Effect was determined repeatedly, but the hypothesis of the cognitive workload was not demonstrated.

Keywords: Affordance, negative compatibility effect, cognitive workload

Introduction

According to Gibson (1979) who suggested the concept of affordance firstly, affordance means things that look like what they are. On the other words, it was defined that the quality of an object, or an environment, that allows an individual to perform action (Son, 2008). This concept has played an important role in the area of product design, cognitive psychology, and architecture as well. For example, the affordance concept has been applied to panic hardware which helps people to escape in dangerous situation. People in panic tend to push a door, when they try to open the door. Hence, the door which should be pulled for opening in the building could be harmful to escape in panic. In practice, in England and United States laws panic hardware should be installed in the building were enacted. Furthermore, in 2012 panic bar function which could push to open easily in emergency was added in door lock product made by Samsung. As above, affordance has been in an integral part of the design area (Kim, 2012, Dec 20).

So far there are studies for demonstrating the advantages of affordance. According to the Csibra and Gergely (2007) study, affordance is advantageous for users to expect and predict functional characteristics rapidly. Other benefit is learning of a tool function by observation should be facilitated when a person uses a tool in a way that fit the observer's biomechanical expectations of behaviours that minimize the muscular and/or articulator costs, and should be impediment in the case where these expectations of behaviours that increase the muscular and/or articulator costs are violated. (Jacquet et al., 2012).

Also in case of imaging actions of tool, the neural responses in Extrastriate Body Area (EBA) of an agent can be distinguished by different agents imagined who use tools (Kim et al., 2012). Above the result focused on the role of EBA. Therefore, according to Kim et al., (2012), it is suggested that the EBA incorporates functional affordance of tools into the body schema in order to enhance the sense of agency and to guide our own actions. It demonstrated affordance can guide our behaviour. Based on Vainio et al.,(2011), it is suggested that tool-specific affordance presented in a short time make motor be inhibited. In the study, in the condition which Stimulus Onset Asynchrony (SOA) between prime stimuli and target stimuli was over 300ms and stimuli's orientation was congruent, positive compatibility effect (PCE) was shown. On the other hand, in the condition which SOA was under 100ms, negative compatibility effect (NCE) was shown. The compatibility effect could be measured by reaction time and error rate. However, in case of tool-no affordance negative compatibility effect was disappeared. This phenomenon could be explained that the role of affordance helps to perceive objects as object's own functions. Vainio et al., (2011) insisted that objects are just perceived as abstract visual attribute by eliminating affordance.
So far only benefits of affordance in experiment condition which participants do just one task have been demonstrated. However these days, people usually face with multi-tasking situation. Therefore it is needed to demonstrate advantages of affordance in the multi-tasking condition. Thus, in the study it is figured out that negative compatibility effect can be shown differently with manipulating affordance condition and no affordance condition and affordance can influence to cognitive workload and adding an extra memory task.

These hypotheses are as below:

i. In the condition which SOA of prime stimuli with affordance under 80ms, reaction time is slower and error rates are lower than the no affordance condition.
ii. In the condition which SOA of prime stimuli with affordance and congruent with arrow's orientation under 80ms, reaction time is slower and memory task's correct responses are lower than the incongruent condition. And mental efficiency (ME) is lower than the incongruent condition.

Experiment

Method

Participants

Nineteen students of Yonsei University (10 females and 9 males, mean age 24.6 years, six participants removed) participated on the experiment. Informed consent was obtained from each subject prior to commencing the task. After finishing the experiment, they obtained 2 credits.

Stimuli and design

The experimental design was 2 (Affordance condition & No-affordance condition) × 2 (Congruence & Incongruence) × 2 (Task difficulty: High & Low), within subject design. Each condition was repeatedly presented for three times and prime stimuli consist of six types which are a mug cup (2), a pan (2), an opener (2), a spoon (2), a glass (4) and a butterfly (4) pictures. A mug cup, a pan, an opener and a spoon pictures belong to affordance condition. On the other hand, a glass and a butterfly pictures belong to no-affordance condition.

Target stimuli were arrow pictures with right and left orientation. In congruent condition, handle of prime stimuli and arrow's orientation (target stimuli) are compatible and in incongruent condition the orientations are incompatible. In case of no-affordance condition there are arrow's orientations were randomly presented. Task difficulty indicates memory task's level. When 3-digit numbers were presented for 500ms, it is called a difficult task condition, whereas 2-digit numbers were presented for 3500ms, it is called an easy task condition. In total, 192 trials were consisted.

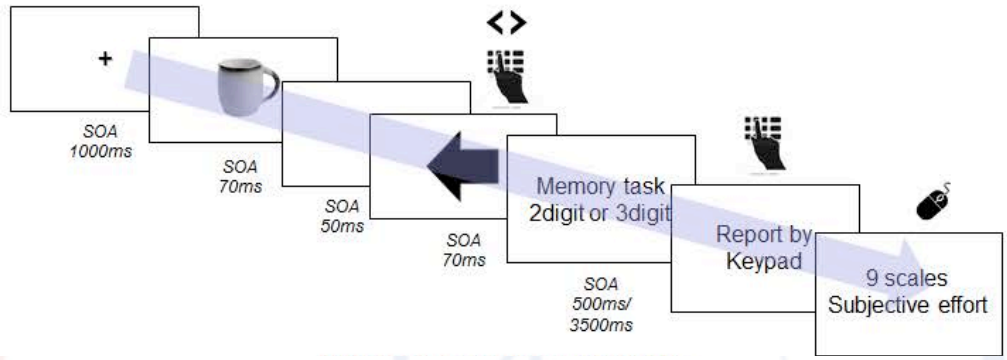
	Affordance	No affordance
Congruence		 or
Incongruence		 or

Table 1. Experimental conditions and stimuli described

Procedure and task

First of all, fixation was displayed for 1,000ms at the beginning of each trial in empty white screen. Then the prime stimuli presented for 70ms is followed by blank screen for 50ms.

When arrow's orientations which are right or left for 70ms are presented, people should respond arrow's orientations with keyboard as soon as possible. After then participants memorize numbers, 2-digit numbers or 3-digit numbers for 3500ms or 500ms. In the memory task, people should report the numbers on N-1 trials. In the last section, subjects are asked subjective effort induced by memory task.



Picture 1. Experimental design

Dependent variables

Dependent variables are reaction time, error rates of the arrow's orientations, correct response rates of the memory task and subjective effort with 9 scales (Tasir & Pin, 2012). Furthermore, mental efficiency (E) was calculated according to the formula E = (P−ME)/2, using z-transformed perceived mental effort values (ME) and performance measures (P). According to this equation, mental efficiency is null when performance and mental effort z-scores are equal (P=ME), positive when performance scores are higher than mental effort scores, and negative when performance scores are lower than mental effort scores (Paas & van Merriënboer, 1993).

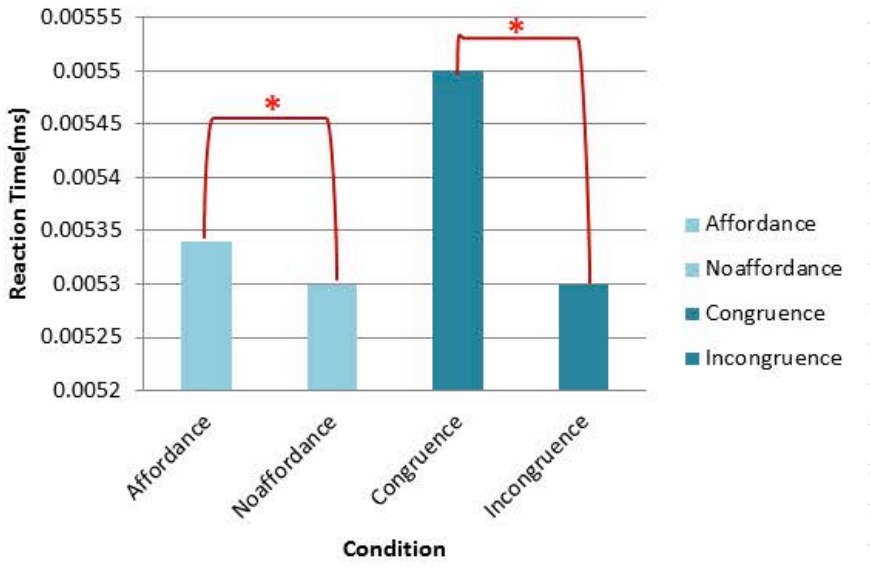
Results

Reaction time and Error rate of arrow's orientation were analysed by one-way repeated-measure ANOVAs.

Reaction time

Only correct response results were analysed and data over 3SD (standard deviation) were rejected. As a result, there is a main effect of affordance condition (affordance and no-affordance conditions), F (1, 1183) = 4.649, p=.031. Specifically, reaction times of no-affordance condition (M=.0053, SD=.0013) was faster than ones of affordance condition (M=.0054, SD=.0013). Furthermore, there is a main effect of congruent condition (congruent and incongruent conditions) within affordance condition, F (1, 602) = 9.289, p=.002. Specifically, reaction times of incongruent

condition (*M*=.0053, *SD*=.0013) was faster than ones of congruent condition (*M*=.0055, *SD*=.0013).



Picture 2. Result of reaction time

Error

As a result, no significant main effect of affordance condition (affordance and no-affordance conditions) and congruent condition (congruent and incongruent conditions) within affordance condition was observed, $p>.05$.

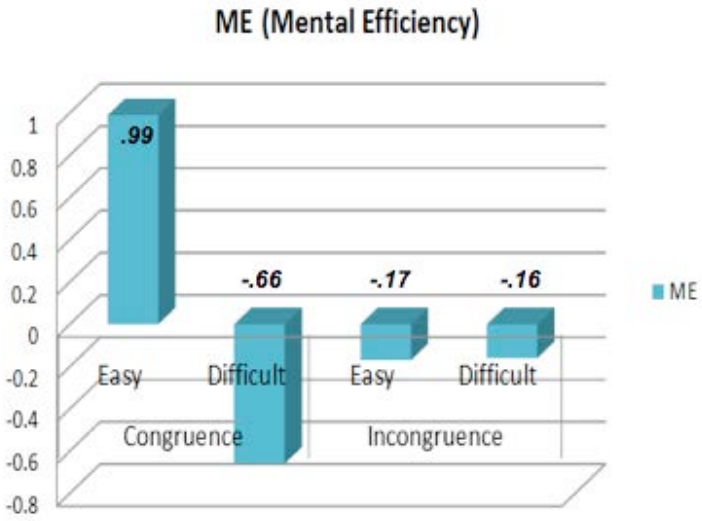
Correct response rates of memory task

Correct response rates were analysed by McNemar test. According to the results, there is a no significant difference between affordance condition and no-affordance condition, $p=.302$. Also, there is a no difference between congruent condition and incongruent condition, $p>.05$.

Mental efficiency

Using the formula E = (P−ME)/2 ((Paas and van Merriënboer, 1993), mental efficiency was calculated. After then results were analyzed by an independent sample T-test. As a result, there is a no difference between congruent condition and incongruent condition, $p>.05$. However, interestingly in the easy task condition mental efficiency (ME=.99) in the congruence was higher than one (ME= -.17) in the incongruence. Negative compatibility effect was not shown in the easy task condition. On the other hand, in the difficult task condition mental efficiency (ME= -.66) in congruence was lower than one (ME= -.16) in the incongruence. Only in the difficult task condition, negative compatibility effect was shown.

Therefore hypotheses were partly demonstrated.



Picture 3. Result of mental efficiency index as a function of task difficulty and congruence

General discussion

Results of this study revealed the relationship between affordance and cognitive workload. Furthermore, negative compatibility effect in a short SOA was demonstrated consistently as Vainio et al., (2011)'s experiment. Although all of hypotheses were demonstrated perfectly, it is meaningful that experimental conditions participants had to do two tasks were suggested for revealing affordance's advantages in the study. The advantage of affordance revealed is affordance help to reduce cognitive workload in only a difficult task.

A reason why there are different results depending on task difficulty and time pressure could be explained by germane mental workload (Sweller, 1988 Galy, Cariou, Mélan, 2012). According to Sweller's theory suggested intrinsic, extraneous and germane cognitive load, germane cognitive load was indicated the load placed on working memory during schema formation and automation (Paas et al., 2003; Sweller et al., 1998). Sweller (1988) insisted that an individual requires extra mental resources in high mental workload for mental process. In the experiment, easy memory task was manipulated by 2-digit number and low time pressure, so participants' mental resource were enough to memorize numbers in congruent and incongruent conditions. On the other hand, in case of difficult memory task manipulated by 3-digit number and high time pressure, participants should allocate their extra resource to entering information. Consequently, the demand for extra resources influenced to mental efficiency, not memory task's performance. Moreover, a reason why the negative compatible effect was shown in mental efficiency is the characteristic of affordance influenced to mental efficiency. If affordance were not related to cognitive workload, positive compatibility effect would be generated in mental efficiency. The results tell there is a relationship between affordance and cognitive workload.

However, a limitation is there is a no difference between affordance, no-affordance conditions, congruent and incongruent conditions in the memory task. This is because it is possible for participants to acquire learning strategies during 192 trials. Therefore learning strategies had an effect on the correct responses of memory task. Furthermore, psychophysiological measures should be needed as Galy, Cariou, Mélan (2012) study. According to Galy, Cariou, Mélan (2012) experiment, they used subjective, performance and psychophysiological measures. Therefore psychophysiological measure such as heart rate or skin conductance response should be added for getting more objective data in further study.

Affordance has played a significant role in design area. So far there have been studies related to affordance, but no exists about effect of affordance to workload before. Therefore, this study is meaningful to demonstrate a relationship between affordance and workload especially in the difficult task condition.

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When an Adjective Behaves like a Verb: Adjectival Verbs in Mandarin Chinese Maternal Input

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Abstract
The distinction between adjectives and verbs in Mandarin Chinese is not as clear as that in English. Adjectives in Mandarin share more similarities than differences with verbs, and most of them may function as verbs. Thus, they are termed adjectival verbs, which are translated into adjectives in English.

Previous studies on Mandarin caregivers' vocabulary have focused on action verbs. Little is known about the production of adjectival verbs. The current study investigated how these similarities and differences are distributed in Mandarin-speaking mothers' adjectival verb use.

We analyzed 40 mothers' speech to children in four age groups: 14-, 20-, 26-, and 32-month-olds. All utterances that contained adjectival verbs were identified and coded for 8 Similar properties and for 2 Distinguishing properties.

Our findings were twofold: First, not all properties were evenly distributed. Utterances in the SV and Verb-alone frame appeared with the greatest frequency, and followed by Negation, V-not-V, and the aspect marker, 'le'. Utterances containing other properties were either rare or none. Second, distinguishing properties also showed an uneven distribution. Degree Adverbs were produced frequently with adjectival verbs but Reduplications for adjectival verbs did not occur.

These results indicate both the similar and distinguishing properties that appear early and frequently in maternal input. This suggests that child Mandarin learners learn simultaneously how adjectival verbs and action verbs behave alike and how they distinguish from each other. This also suggests the role of frequency in the order of acquisition of these properties.

Introduction

The distinction between adjectives and verbs in Mandarin Chinese is not as clear as that in English. Adjectives and verbs in English belong to two different categories respectively, and thus, they behave grammatically differently. Adjectives must co-occur with copulas while verbs need to be inflected to encode tense, aspect, and mood (see Example 1 & 2).

(1) Apples and oranges were different. (adjective)
(2) Apples and oranges differed. (verb)

However, in Mandarin Chinese, adjectives and verbs are hard to differentiate from each other. Adjectives in Mandarin Chinese share more similarities than differences with verbs, and most adjectives may function as verbs (Tang, 2012; Chu, 2010; Li & Thompson, 1981; Ross and Ma, 2006). That is, adjectives can appear as the predicate in a sentence. Thus, adjectives in Mandarin Chinese are termed adjectival verbs, which are translated into adjectives in English (see Examples 3 & 4).

(3) Zhe4 hai2zhi cong1mimg2
This kid smart
"This kid is smart."
(4) Pin2kuo3 hao3 tian2
Apple very sweet
"(The) apple is very sweet."

Previous studies (e.g., Tardif, Shatz, & Naigles, 1997; Tardif, Gelman, & Xu, 1999) on Mandarin maternal input have focused on action verbs (e.g., tui1 '*push*', pao3 '*run*'). These studies found that Mandarin caregivers produced more verbs types and tokens than English caregivers. However, little attention has been paid to how adjectival verbs are used in maternal speech to child Mandarin learners. Based on the Similar properties sharing with action verbs and Distinguishing properties from action verbs selected from Tang (2012), the current study investigated how these properties are distributed in Mandarin-speaking mothers' adjectival verb uses when they talk to young children.

The eight Similar properties (a-h) and two Distinguishing properties (i-j) as well as their examples are presented as follows.

(a) Both adjectival and action verbs can appear as the predicate in a sentence.
Zhe4 pin2kuo3 tian2
This apple sweet
"This apple is sweet."
(b) Both adjectival and action verbs can appear alone.
Q: Zhe4 pin2kuo3 tain2 ma1?
This apple sweet Q-marker
"Is this apple sweet?"
A: Tian2
Sweet
"(It's) sweet."
(c) Both adjectival and action verbs can be used with negation.
Zhe4 pin2kuo3 bu4 tian2
This apple not sweet
"This apple is not sweet."

(d) Both adjectival and action verbs can appear in V-not-V form.
Zhe4 pin2kuo3 tian2 bu4 tian2?
This apple sweet not sweet
"Is this apple sweet?"

(e) Both adjectival and action verbs can follow an auxiliary.
Ni3 yao4 xiao3hsin1
You must careful
"You must be careful."

(f) Both adjectival and action verbs can be used as imperatives.
Xiao3hsin1
Careful
"Be careful!"

(g) Both adjectival and action verbs can be modified by temporal/locative/scope adverbs.
Ta1men2 zuo2tian1/zai4zhe4li3/dou1 hen3 kwai4le4
They yesterday/here/all very happy
"They were very happy yesterday."
"They are very happy (when staying) here."
"All of them are very happy."

(h) Both adjectival and action verbs can carry aspect markers/complements.
Feng1 ye4 hong2 le
Maple leaf red PFV (perfective aspect)
"Maple leaves turned red."
Ta1 lei4 de wu2fa3 kong1zuo4
He tired unable work (resultative complement)
"He is so tired that he cannot work."

(i) Adjectival verbs can be modified by degree adverbs but action verbs cannot.
Zhe4 pin2kuo3 hen3/shi2fen1/zhe4me tian2
This apple very/quite/so sweet
"This apple is very/quite/so sweet."

(j) Adjectival and action verbs are different in reduplication form.
Adjectival verbs: AA, AABB
Example 1: chung4chung4 ('heavy')
Example 2: piao4paio4 liang4liang4 ('beautiful'/'pretty')
Action verbs: A-(yi)-A, ABAB
Example 1: kan4kan4 ('*look*'); kang4yi2kan4 ('*look*')
Example 2: yan2jiu4 yan2jiu4 ('*study*'/'*investigate*')

Method

Participants

The participants included 40 Mandarin Chinese-speaking mothers selected from the CHILDES Mandarin corpus (MacWhinney, 2000; Zhou, 2000). All participants were native Mandarin speakers living in Nanjing, China. The transcripts included these mothers' speech to children from one of four age groups: 14-, 20-, 26-, and 32-month-olds. There were 10 mother-child dyads in each age group. The numbers of girls and boys within each group were equal. None of the children showed a hearing impairment or developmental delay.

Procedure

The mother-child conversation and interactions were video-recorded in each child's day care classroom. The mother and her child began semi-structured play, in which they played and talked using the contents of four boxes. The four boxes respectively contained (1) a ball, (2) a popular toy, (3) paper and crayons, and (4) a picture book with stories in Chinese. All dyads were told to explore all the four boxes in about 10 minutes.

Transcription and Coding

The transcripts were obtained from the CHILDES Mandarin corpus (MacWhinney, 2000; Zhou, 2000). Mothers' speech was used for data analyses. Coding was restricted to utterances appearing in their spontaneous speech. Therefore, all those utterances appearing in memorized or routine phrases, such as social routines (e.g. thank you, bye-bye, and so forth), songs, poems, nursery rhymes, and story narratives were excluded from coding. All of the mothers' utterances that fit the above criteria and included adjectival verbs were coded for eight Similar properties sharing with action verbs and two Distinguishing properties from action verbs that were presented in the Introduction section. A qualified utterance may have more than one property. After coding, frequencies were counted for distribution.

Results

The purpose of this study is to investigate how similar and distinguishing properties are distributed in Mandarin-speaking mothers' adjectival verb uses when talking to young children. The frequency distribution of similar properties in maternal input is presented in Figure 1. As Figure 1 shows, not all similar properties were evenly distributed. Utterances in the SV and Verb-alone frames appeared with the greatest frequency, and followed by Negation, V-not-V form, and Aspect marker 'le'. Other properties were produced rarely or none.

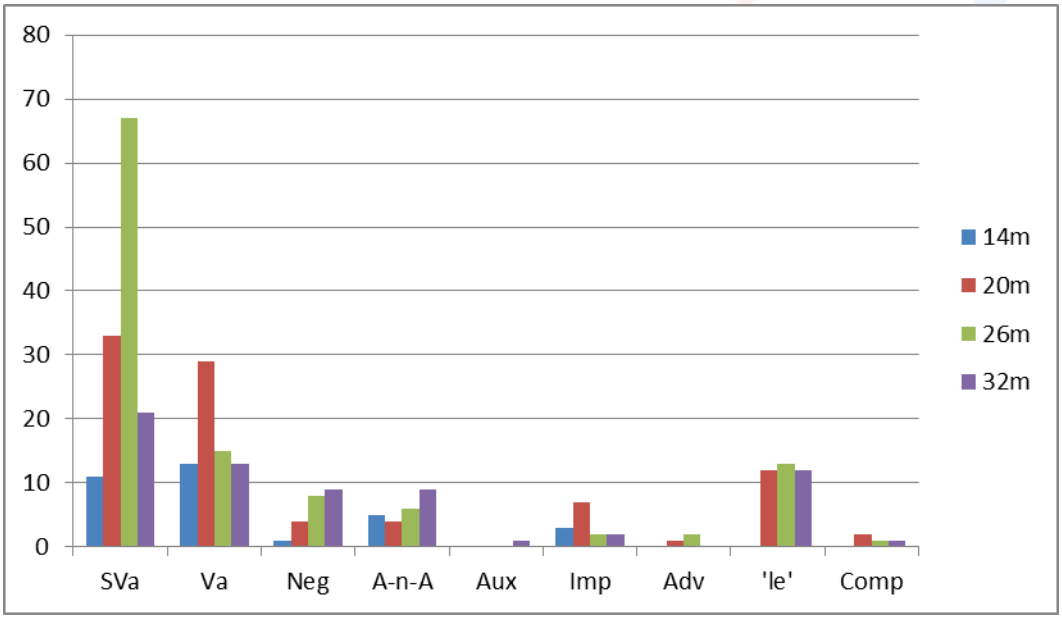

Figure 1. Frequency distribution of Similar properties in maternal adjectival verb uses

Like similar properties, distinguishing properties also showed an even distribution.

Degree Adverbs were produced frequently with adjectival verbs but Reduplications for adjectival verbs did not occur at all (see Figure 2).

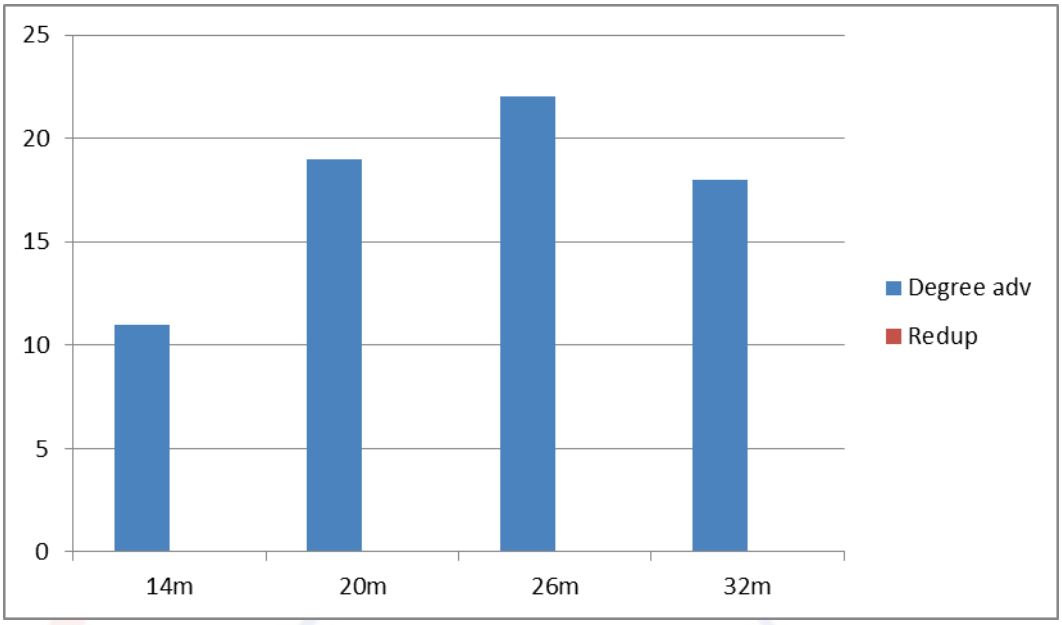

Figure 2. Frequency distribution of Distinguishing properties in maternal adjectival verb uses

Discussion

By comparing similar and distinguishing properties in maternal adjectival verb uses, this current study revealed that Mandarin-speaking mothers produced adjectival verbs distinctively. That is to say that, these properties did not evenly occur in the maternal input simultaneously. Three Similar properties and one Distinguishing property were used early and frequently: the SV frame, Verb-alone frame, aspect marker 'le', and Degree Adverbs. This suggests that child Mandarin learners learn simultaneously how adjectival verbs and action verbs behave alike and how they distinguish from each other.

The properties that mothers used early and frequently appear to be the frames that children might acquire early in their language development (Cheng, 1986; Erbaugh, 1992). These results suggest that how mothers use adjectival verbs may play a role in the acquisition of adjectival verbs and also in the order of acquisition of these properties. To test this possibility, child production data will be needed. Further analyses shall include the frequency distribution of these properties in child adjectival verb uses. To determine whether maternal adjectival verb uses are reflected in children's acquisition, correlation analyses will be needed to see whether there is any relationship between maternal and child adjectival verb production.

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Supervision as an Educational Activity in Clinical Psychology Training Programs: Conceptions on its Core Characteristics and Implementation

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Abstract
During the first stage of an educational evaluation study, a qualitative exploration has been conducted on conceptions that clinical supervisors hold in regard to the characteristics of supervision as an educational activity in higher education programs. Hence, 10 clinical supervisors affiliated with a bachelor's program in psychology and a master's program in clinical psychology –both offered by a private university at Bogotá, Colombia- were enrolled as voluntary participants. Data were collected by means of a semi-structured interview and responses were analyzed using the NCT method (Friese, 2012). Software for qualitative analysis was also used in this study. Results include descriptors of supervision's basic characteristics, participants' roles and ideal scenarios of implementation. Additionally, this study reveals some critical issues related to: 1) the nature of supervision in the bachelor's program and its similarities and differences when compared to a mentoring process (Milne, 2009); and 2) the perceived emphases of supervision in skills training versus development of competencies. Conducting further research aimed to a contextualized and deep understanding of the pedagogical functioning of these educational programs is needed in order to methodologically triangulate and enrich the validity of the abovementioned findings.

Keywords: supervision, clinical psychology, education, conceptions, Colombia

Introduction

In Colombia, supervised clinical practicums are a common experience among every undergraduate program in psychology, as well among graduate programs with a professional emphasis. Specifically, practicums have been defined as learning periods where students are immersed in a professional setting in order to undertake professional responsibilities (Baird, 2011; Wolfgang, 1976). In addition, students perform their newly assigned duties under supervision of a faculty member or a senior clinician. All of this is founded on the assumption that quality supervision enriches professional development (Falender & Shafranske, 2004; Morris & Haas, 1984).

Additionally, the literature on this field provides one of the most comprehensive definitions of clinical supervision, proposed by Falender & Shafranske (2004):

> *"Supervision is a distinct professional activity in which education and training aimed at developing science-informed practice are facilitated through a collaborative interpersonal process. It involves observation, evaluation, feedback, the facilitation of supervisee self-assessment, and the acquisition of knowledge and skills by instruction, modeling, and mutual problem solving. In addition, by building on the recognition of the strengths and talents of the supervisee, supervision encourages selfefficacy. Supervision ensures that clinical consultation is conducted in a competent manner in which ethical standards, legal prescriptions, and professional practices are used to promote and protect the welfare of the client, the profession, and society at large."* (p. 3)

Based on this definition, it is possible to identify core characteristics and components of clinical supervision. In fact, understanding supervision and its components makes evident that supervisors are, on one hand, responsible for the welfare of the clients that are been assisted by the supervisees and, on the other hand, for their appropriate development of the professional competencies required for an autonomous, responsible and effective practice (Malloy, Dobbins, Ducheny & Winfrey, 2010) or for a successful transition towards graduate school. However, in the Colombian context, 60% of holders of an undergraduate diploma in psychology, do not enroll in further graduate studies (Ocampo, Suárez, Fonseca & Aguirre, 2012). This is due, in part, to a current legislation that only requires the completion of a 4 or 5-year undergraduate program in psychology before being fully licensed to practice autonomously in any psychological specialty. In spite of this, graduate programs in clinical psychology are progressively growing in number, in response to a demand of psychological services of higher qualifications, but coverage and access are still limited.

It is also important to note that –for a majority of psychologists in Colombia- supervised practicums are the only training experiences in a real setting before entering the profession as completely independent and autonomous practitioners. Therefore, clinical supervision and supervised practicums are crucial elements in the professional development of every psychologist (Rusell & Petrie, 1994; ASPPB, 1998; Lizzio, Wilson & Que, 2009). At the same time, acknowledging the role of supervision carries an evaluation imperative towards the identification of the

contributions that supervised clinical practicums make in favor of attaining the necessary educational goals that warrant the awarding of a professional diploma.

Nonetheless, an evaluation study can only be implemented after developing a deep and systematic understanding of the pedagogical actions that clinical supervisors are deploying as part of their supervision sessions. Moreover, it is hypothesized that design, implementation and evaluation of pedagogical actions can be influenced by the perspectives, beliefs or conceptions that clinical supervisors hold in regard to the educational nature of their very own enterprise. Consequently, this paper reports an exploratory study useful to acknowledge the role of conceptions in the supervisory endeavor, as well as to identify important improvement needs.

Methods

This paper reports an exploration of conceptions that is embedded in a broader evaluation study of the supervised clinical practicums at a bachelor's program in psychology and a master's program in clinical and health psychology. Both programs are offered by a private university –recipient of a high quality accreditation awarded by the National Ministry of Education- located in Bogotá, Colombia. Hence, during the analysis stage, it will be necessary to identify elements of the supervisors' conceptions that could be indicative of evaluation foci to be examined in further studies.

Additionally, we have assumed a qualitative approach due to our interest in getting to know the day-to-day reality of the selected programs –not only as interpreters- but, also, as interlocutors of the stakeholders involved (Stake, 2010). Therefore, we began by contacting the Director General and the Director of Professional Development at the department of psychology of the participant institution in order to obtain the corresponding permissions for this study. Then, during the second half of 2013, we emailed an invitation to every clinical supervisor affiliated with the master's program (six, in total) and to those affiliated with the bachelor's program (eight, in total). Of the pool of potential participants, 13 supervisors agreed to be part of this study and one of them did not reply the contact request. Out of 13 consenting participants, 10 agreed to schedule an appointment while three supervisors had conflicting schedules. Every participant signed a consent form after being thoroughly informed of the voluntary nature of the study, the characteristics of the instruments, analysis and final report, as well as the acceptance of an audio recording.

Afterwards, participants filled in a brief form that included basic biographical data as well as information about their educational level, experience as clinical supervisors and specific supervisory training. Then, they answered to a semi-structured interview with open questions about their own ideas about clinical supervision as an educational activity, the actors involved, their corresponding roles, and scenarios of implementation. The data reported on the biographical forms reveals that participants are 45.7 years old and have been conducting supervision for 9.5 years –on average-. In regard to their educational level, two of them hold a PhD degree, seven have been awarded a master's degree diploma and one of them was pursuing their master's degree, at that moment. Finally, in regard to their specific training as clinical supervisors, seven of them declare not to have been trained as supervisors, two of

them had access to supervisory training during their PhD studies, and 1 of them went through supervisory training during their master's studies.

After conducting the interviews, the recording files were transcribed and the resulting documents were incorporated to a hermeneutic unit on the Atlas.ti 7 software. This software was used to facilitate the process of identification of code frequencies, text segments, relations and repetitions (Friese, 2012). Then, we used the NCT approach described by Seidel (1998, cit. por Friese, 2012) as our analytic strategy. This approach makes reference to three basic processes: noticing things, collecting things and thinking about things. Specifically, the first step was carried out by means of a thorough review of all the data in order to note –mostly descriptively- (Friese, 2012) those findings or relevant data that could be preliminary related to our research questions. In second place, collecting things corresponded to a broader extent to what has been described in the literature as coding (Auerbach & Silverstein, 2003) or categorical aggregation (Stake, 1998). As it name implies, we grouped conceptually similar elements -or elements that make evident a data pattern- that were useful to identify thematic units with a broader level of abstraction (Auerbach & Silverstein, 2003; Friese, 2012). Finally, findings were integrated into a comprehensive narrative in order to answer the research questions.

On par with the NCT approach, we also employed the strategy of triangulation by theory as well as member checking (Stake, 1998, 2006, 2010). In conducting member checking (Stake, 2010), we look to confirm that quotations and data registers related to respondents' testimonies were precise and considerate. Meanwhile, in triangulating by theory, we identified and included complementary theoretical perspectives that supported the findings of this study.

Findings and Discussion

After analyzing the answers provided by every participant, we identified a set of categories and their content is developed throughout the narrative presented below. Additionally, in order to preserve confidentiality of the participants' identities, we are going to use the characters A, B, C and D to allude to the supervisors affiliated with the master's program, while the numbers 1, 2, 3, 4, 5 and 6 correspond to the supervisors affiliated with the bachelor's program. Finally, since the interviews were carried in Spanish, every quotation will be presented in an adapted translation that might omit some nuances or particularities of the language.

To begin with, the supervisors of the master's program share a view in which clinical supervision is defined as an environment designed for skill and competency development. In this sense, it is acknowledged that supervision is based on a formative interaction where a professional under ongoing training is willing to develop certain competencies and, for that purpose, they interact with a professional with a higher level of competence (Supervisor D). In detail, one participant mentions:

> *"Supervision is the most appropriate setting to promote skills development. I also think that you can acquire some knowledge in supervision, as well as collect information useful for other academic activities. However, I think that supervision is the most appropriate setting to develop and consolidate clinical skills" – Supervisor B*

This definition is further complemented with a distinction that supervisors make among other types of learning -theoretical, conceptual or information assimilation- that might also occur during a supervision process. Nevertheless, those types of learning are not conceived to be a primary goal of clinical supervision (Supervisor D).

> *"During a supervision session, one can transmit theoretical information and knowledge. But, I think that supervision has a privileged focus on skills training" – Supervisor A*

At this moment, it is important to further explore the ideas that supervisors hold in regard to skill or competency development. In particular, competency is described in the literature as a much broader construct that includes a series of skills –or abilities- which, in turn, are required for performing a complex task in a specific professional context (Falender & Shafranske, 2004). In the case of the supervisors affiliated with the master's program, we identify a privileged association of supervision with skill development. In contrast, only one of the participants expressed a divergent view by mentioning that a skill is, in fact, a sub-category of competency, because it is a technical task that do not necessarily requires a substantial knowledge of their theoretical underpinnings, the evidence supporting it or its most appropriate use with a real client (Supervisor D). Moreover, skills can be viewed as fixed and determined, while competencies are dynamics because they vary in response to the context of implementation or performance (Falender & Shafranske, 2004). This implies that one particular skill could be part of a competency in some instances, and not in others and that variability of usage could possibly demand from the supervisors different pedagogical strategies in order to facilitate their acquisition. Therefore, an evaluation study will require direct observation of supervision sessions in order to gather evidence regarding the type of learning that is being promoted, be it a skill or a competency.

In turn, the supervisors affiliated with the bachelor's program acknowledge that supervision is also an interaction setting focused on accompanying supervisees and facilitating theoretical and applied learnings (Supervisor 2). This process is also deployed during a transitional stage –faced by the supervisees- from a purely academic context towards a new, dynamic and demanding professional environment. This is described by one participant as it follows:

> *"In my view, supervision should be named 'companionship'. Supervision is not a lecture, it's a bridge, a link between the theoretical knowledge that students have been gathering, and its real, concrete application. So, supervision means providing companionship in that process, that transition from theory towards application" – Supervisor 5*

That differential emphases reported by each group of supervisors could be explained by the peculiarities in the implementation of every program they are affiliated with. However, the process of providing 'companionship' to the supervisees could be better conceptualized as mentoring (Milne, 2009), as it is described in the literature, because such practice stresses to accompany students during vulnerable transitional stages, in order to promote their wellness and personal growth.

In addition, the interaction during a supervision session occurs between the supervisor and the supervisees. Nonetheless, it is worth highlighting that some of the supervisors also view the supervisees' clients as implicit actors.

> *"A third actor in a supervision session –besides the supervisor and the supervisee- is implicit… the client is also an actor because thanks to them the supervisor would be able to model skills and the supervisee will also be able to practice those same skills" – Supervisor B*

This conception of a triadic system is well described in the literature. In fact, it is considered that some other individuals that are in contact with the client's life also have the potential to impact the supervisory system. However, the triadic system is the widest and makes evident that the supervisee is the center of the process making it always necessary to reconcile the client's clinical needs with the formative interventions of the supervisor (Bernard & Goodyear, 2004).

Furthermore, the participants mention that supervision does not only have a formative function. It also has a protective function because the supervisee faces –with some frequency- a variety of situations that are emotionally challenging. In those situations, the supervisor has the appropriate training to provide emotional support (Supervisor 2). To a lesser extent, some other participants also describe that supervision could exert a quality control of the practice, always in compliance with ethical and professional standards (Supervisor 4). In particular, the participants say:

> *"There are other functions of supervision. One of those has to do with creating a space where we can discuss about how the supervisee is personally affected by their job… at an emotional level. Therefore, we have to provide that kind of space to protect, to emotionally protect the supervisee, because the tasks they do can be highly toxic. I mean, it could have a personal and negative impact on them… that's why we create that space of emotional support" – Supervisor D*

> *"Supervision facilitates that every therapeutic process implemented by the supervisees gets better and develops progressively until it complies with the standards that every therapeutic intervention is supposed to fulfill" – Supervisor C*

The literature on clinical supervision supports the assertions of the participants. In particular, supervision has –in addition to its formative function- a normative function. Such normative function makes reference to an appropriate caseload management (Milne, 2009; Bernard & Goodyear, 2004), monitoring of quality of psychological services provided (Milne, 2009; Watkins, 1997), and compliance with ethical standards and current legislation (Falender & Shafranske, 2004). In sum, these normative elements warrant protection of the client's welfare (Milne, 2009; Bernard & Goodyear, 2004; Falender & Shafranske, 2004; Watkins, 1997). On the other hand, the emotional support is described in the literature as a restorative function of supervision (Milne, 2009) which is directed towards facilitation of expression and processing of emotional states experienced by the supervisees.

Other important aspect of the functioning and implementation of supervision is related to the roles performed by every participant in the supervisory system. In particular, the supervisors affiliated with the bachelor's program, as well as the master's program, share a common conception in which the supervisor performs a role of orientation and organization of the learning experience (Supervisor C, Supervisor 4). Likewise, the supervisor also performs a role of evaluation and contention of the supervisee. Complementary, the participants also mentioned that the supervisor is not a source of information, nor a person who commands every action that should be executed.

> *"The supervisor is a learning facilitator. They are not a person who imparts wisdom. They do not teach knowledge. The supervisor facilitates, designs an appropriate environment so the person undergoing training maximizes their learning. In being a designer of a learning environment, the supervisor has to facilitate learning by modeling different ways of doing things. That's the added value of supervision in contrast with a purely theoretical activity" – Supervisor D*

This constructivist view of clinical supervision is also consistently reported in the literature. In this sense, the supervisor provides resources and support to the supervisees in order for them to solve the problems and challenges they face (Milne, 2009). This implies that the supervisee has a previous knowledge that is a foundation for ulterior learnings, making it necessary for the supervisor to implement a diverse array of strategies like guided learning, direct instruction, questioning, role-playing, modeling, among others (Milne, 2009; Davies, 2000; Padesky, 1996).

Now that the supervisor's role is conceived primarily as a constructivist role, it is easier to understand why the participants mention that the supervisor is not a source of knowledge, nor a person who commands each and every action executed by the supervisee. Consequently, the supervisee's role is seen as the most crucial role in a supervisory system. The supervisee is the primary actor of supervision and has very specific learning needs (Supervisor C), as well as many responsibilities including –but not limited to- performing their clinical skills, collecting and analyzing clinical data, self-managing their learning process, recognition of previous learnings, and identification of knowledge gaps, all of that in order to perform competently in a professional environment (Supervisor B). This active role is also evidenced in the degree of involvement the supervisee exhibits in activities requiring search, analysis and discussion of academic resources as well as a strong initiative in designing their own projects to solve and intervene in clinical problems identified in their practice setting (Supervisor 1). More details are provided by one participant as it follows:

> *"The supervisee's role implies gathering raw clinical data, in videos, reports, session notes. They also have to be able to collect enough clinical data to be used in the supervision session. But, the supervisee also has to bring knowledge by means of reviewing relevant literature, empirical evidence and, at an appropriate time, clinical protocols, among other things… they also have to be able to share some personal information, about the emotional impact they face, and so on" – Supervisor B*

This characterization of the supervisee's role is also shared by some authors (Milne, 2009; Falender & Shafranske, 2004; Driscoll, 1999). In fact, it is stated that a successful supervision depends, primarily, on the willingness and commitment of the supervisees with their own engagement and learning (Milne, 2009; Driscoll, 1999). In consequence, the supervisee is expected to perform certain tasks, like preparing a session plan, or an agenda for the supervision sessions, provide information and structured updates in relation to their caseload, request specific feedback and look for peer support (Milne, 2009). Likewise, some other authors also mention that the supervisee has to actively learn by means of reviewing, assimilating and implementing the most relevant literature and, at the same time, they are expected to integrate the supervision process with the clinical actions performed with the client (Milne, 2009; Falender & Shafranske, 2004). Moreover, the supervisee is also intended to develop their own reflective capacity for assessing the quality of supervision, and the personal and professional impact their practice has on them (Milne, 2009; Falender & Shafranske, 2004).

After having defined clinical supervision, identified its functions, and characterized its actors –and their corresponding roles-, the interviewees described their conceived ideal and inappropriate scenarios of supervision. In first place, the supervisors of the master's program identify a second level of supervision as an element that will substantially enrich their supervision implementation. This means that, in an ideal scenario, supervisors' supervision sessions should be supervised in order to collect feedback with evaluation and improvement purposes (Supervisor A, Supervisor C). One of the participants says:

> *"If my supervision sessions could be videotaped and reviewed by another supervisor… and discuss about them, and have that time for supervising the supervision… that would be great. The supervisor would receive feedback on their own work. It would be a second level of supervision that will allow me to refine all of those skills" – Supervisor C*

In this regard, supervision of supervision has been acknowledged in the literature as an infrequent practice. In fact, quality of supervision is usually estimated based on opinions or evaluations answered by the supervisees (Rodenhauser, 1997) and only until recently there has been an emergence of supervised training options for supervisors (Bernard & Goodyear, 2004). Moreover, this type of training is significantly scarce but it could be a resource with the highest potential to compensate for the lack of previous training for many of the participants.

Now, in contrast, an inappropriate supervision scenario would include a supervisor focused on providing commands and strict directions on what the supervisee should and should not do (Supervisor B). This type of supervision would not promote the supervisee's autonomy especially because the mere following of indications is poorly efficacious, especially when it is taken into consideration that a competent clinical psychologist requires not only an assimilation of the knowledge of the discipline but, also, a well-developed skill to make decisions, solve problems and generate new knowledge (Supervisor B). One of the participants, further elaborates on this scenario and states that supervision could be even more inappropriate if based only on a verbal retrospective self-report provided by the supervisee (Supervisor D). This assertion is founded on the fact that the quality of the evidence on supervisees' learning gathered

through self-report is very low, in contrast with the evidence gathered by means of using recordings of therapy sessions conducted by them. Therefore, one of the most important resources to be used in supervision sessions should be audio or video recordings. In their own words, supervisor D explains:

> *"Supervision can't be based on a hierarchical interaction, where one person provides commands and the other follows them. And that's what I've observed here in Colombia. The old tradition of 'you have to do this and that' and at the next session 'hey, what did you do? Why did you not do what I told you?'. A supervisor like that will conduct a very inappropriate supervision because they will only be teaching how to follow instructions, instead of teaching how to solve things, or to generate knowledge. So, any unstructured supervision, or any supervision that does not promote the active involvement of the supervisee, and the self-correction during the learning process, is insufficient. Additionally, audio and video recordings are crucial. If we don't have recordings then we will not have a good supervision because we will be making reference to a self-report, and the self-report is what the supervisee can recall, plus what they extracted, plus what they added… and that's different from listening to a recording. The so-called 'verbal' retroactive supervision –for me- is only a vague memory, or maybe some commentaries about biased remembrances that a person has and its value is very limited" – Supervisor D*

The literature reports converge on the idea that reviewing cases based primarily on the retrospective self-report provided by the supervisee is the most common strategy employed during supervision sessions (Bernard & Goodyear, 2004; Goodyear & Nelson, 1997) due to its convenience and straightforward implementation, even in spite of it also being recognized as an activity of modest efficacy in contrast to analyzing audio and video recordings or conducting in-vivo observations. In an unfavorable scenario, the supervisee's self-report could be a distorted narrative of their clinical actions and would make it very difficult for the supervisor to identify the clinical problems of the consulting client and to implement the appropriate strategies to design a responsive clinical intervention plan (Bernard & Goodyear, 2004). Complementary, a supervision process exclusively centered on the formulation of commands and instructions is incompatible with a constructivist view of learning, due to the fact that the supervisee will only be acting as a replacement of the supervisor – who would be performing as the 'real' therapist- and the supervision sessions would only focus exclusively on the client, ignoring the learning needs of the supervisee (Falender & Shafranske, 2004) and, consequently, denaturalizing the formative quality of supervision.

In turn, the supervisors of the bachelor's program state –clearly and repeatedly- that an inappropriate supervision would be one that gravitates exclusively around its academic facet, omitting reflection and exploration of the emotional experiences the supervisee faces while transitioning to a professional environment (Supervisor 1). This also includes any form of interaction between supervisor and supervisee that could be invalidating, hypercritical, o personally aversive (Supervisor 1, Supervisor 2), which would have negative implications in terms of developing a professional vocation.

> *"An inadequate supervision is one where the supervisee is judged and criticized, and seen as someone who lacks knowledge. That will make them afraid, insecure and will lead them to question their professional vocation because they will always think 'nothing is good enough'. We do an unfortunate favor to the supervisee if we terrorize them, and our students will feel terrorized if they think they're going to be judged" – Supervisor 2*

Being this the last aspect covered by this exploration, it is worth noting that the study of ineffective supervision indicates that many pervading elements in a supervisory process could belong to an organizational, professional or relational dimension (Falender & Shafranske, 2004). Therefore, a supervisor that omits important disciplinary topics, establishes a conflictive –or overprotective- interaction with their supervisees, or lacks professional competence, will have a significantly negative impact on the learning process of their students (Bernard & Goodyear, 2004; Falender & Shafranske, 2004).

Conclusions

This study was designed to identify the conceptions held by clinical supervisors affiliated with a bachelor's program in psychology and a master's program in clinical psychology, in regard to clinical supervision as an educational activity. This exploration is also a context-responsive resource for designing and implementing –in the future- an educational evaluation study. In fact, the conceptions described by the participants make evident some ideas compatible with previous research reports on clinical supervision. Likewise, it was possible to identify tensions –or critical issues- within programs and between programs. This tensions, or divergent views, are significant indicators of evaluation foci to be addressed in future studies.

In detail, supervisors of both programs describe supervision as an interaction with formative, normative, and restorative functions (Milne, 2009) implemented in a dyadic or triadic system (Bernard & Goodyear, 2004). In this system, the supervisor performs a facilitating role while supervisees performs a very active role, since they are the primary actors of supervision (Milne, 2009).

Contrastingly, within the master's program, there is a tension between the emphases of supervision on skill development versus competency development. This tension is relevant when we consider that 'competency' is a broader construct, in contrast with 'skill' (Falender & Shafranske, 2004). In fact, a skill possesses a technical quality whereas a competency requires integrating skills and knowledge, according to the functions demanded by the professional environment (Falender & Shafranske, 2004).

In reference to the functions of supervision, the master's program has a clear emphasis on skill and competency development while the bachelor's program has an emphasis on providing 'companionship' and emotional support to the supervisees, during a transitional stage from a purely academic setting towards a professional environment. This differential emphases are worth noting because the latter form has been conceptualized in the literature as mentoring (Milne, 2009), even in spite of some of the characteristics it shares with clinical supervision.

In last place, these divergent views shed light on the research path to follow. Therefore, it is necessary to develop a deep understanding of the pedagogical functioning of these programs not only in terms of conceptions but, also, by contrasting the realities envisioned by every group of stakeholders, with the characteristics of their context, and the direct observation of the program implementation processes. In doing so, it will be possible to value the contribution that these programs are making, in consideration of the professional standards and the expected fulfillment of the supervisees' educational needs.

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Understanding Antisocial Behaviors: The Roles of Sensation Seeking and Subtypes of Empathy

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Abstract
There is limited research on how subtypes of empathy predict subtypes of antisocial behaviors and the role of sensation seeking in antisocial behavior. Therefore the current study used an online survey with 17-25 years old N= 540 undergraduate students to investigate the relationship between three subtypes of empathy (emotional reactivity, cognitive empathy and social skills) and two subtypes of antisocial (physically aggressive and non-aggressive) behaviors, as well as the role of sensation seeking in moderating this relationship. The Demographic Variables Questionnaire, Brief Sensation Seeking Scale, Empathy Quotient and the Antisocial Behavior Measure were used. Spearman's rank correlational tests, regression and a 2 way ANOVA with interactions were used to analyze the data.

There was a negative correlation between the three subtypes of empathy and the two subtypes of antisocial behavior. Emotional reactivity emerged as the most significant predictor of antisocial behaviors regardless of the subtype. Sensation seeking also emerged as a significant predictor of both subtypes of antisocial behavior. A significant interaction emerged between sensation seeking and subtypes of empathy in predicting subtypes of antisocial behaviors. High sensation seeking with low emotional reactivity, and high sensation seeking with low social skills predicted physically aggressive behaviors whereas low sensation seeking with low social skills predicted non-aggressive behaviors. In addition, high sensation seeking with low cognitive empathy and low sensation seeking with high cognitive empathy predicted non-aggressive behaviors. The results indicate the need to consider sensation seeking as well as empathy when analyzing antisocial behaviors.

Keywords: antisocial behavior, empathy subtypes, emotional reactivity, cognitive empathy, social skills, sensation seeking

Introduction

Different subtypes and levels of empathy (e.g. Feilhauer & Cima, 2013; Jones, Happé, Gilbert, Burnett, & Viding, 2010) have been related to different types of antisocial behaviors. Empathy is a pro-social emotion consisting of understanding of others' state of mind (Eisenberg, 2010; Thompson & Gullone, 2008). The subtypes of empathy have been classified in the literature as affective empathy, emotional reactivity, cognitive empathy, motor empathy, and social skills (e.g. Bons et al., 2013; Lawrence, Shaw, Baker, Baron-Cohen, & David, 2004).

Affective empathy implies sharing of others' emotions such as experiencing the same emotions of distress as another person is feeling after the death of his/her loved one. Emotional reactivity refers to emotional reaction in response to other people's emotions such as enjoying caring for others and getting upset at others' distress. Cognitive empathy implies understanding of others' thoughts, for example knowing what one feels. Motor empathy implies the interpretations of others' motor movements such as varying facial expressions. Social skills imply understanding of social relations, for example dealing with relationships and judging the difference between rudeness and politeness (e.g. Bons et al., 2013; Lawrence et al., 2004).

The predictor variables in the current study were the subtypes of empathy which have been identified by exploratory (Lawrence et al., 2004) and subsequent confirmatory factor analyses (Berthoz, Wessa, Kedia, & Wicker, 2008; Gouveia, Milfont, Gouveia, Rique Neto, & Galvao, 2012; Muncer & Ling, 2006) of the Empathy Quotient (Baron-Cohen & Wheelwright, 2004) administered to the general population, students and a small number of people with autism.

The dependent variables in the current study were antisocial behavior subtypes according to the classification of conduct disorders (American-Psychiatric-Association, 2000; Rowe, Maughan, Worthman, Costello, & Angold, 2004) as physically aggressive (physical or verbal aggression towards human beings or animals) and non-aggressive behavior (involving aggression towards others' possessions such as stealing and damaging others' property i.e. vandalism) derived from an antisocial behaviour measure from the Edinburgh Study of Youth Transitions and Crime survey (Smith & McVie, 2003). Physically aggressive behaviour in this study refers to direct/actual aggression (e.g. hitting or punching someone) or indirect/threatened aggression (e.g. threatening to hurt somebody if they do not hand over something they are wearing) towards another person. In contrast, non-aggressive behaviors refer to actual/direct aggression (e.g. setting fire to someone's property) or threatened/indirect aggression (e.g. being rude in public place, verbally abusing someone by threatening to damage their personal belongings) against things, objects and people's possessions. Non-aggressive behaviour is a type of indirect harm directed towards other people through aggression towards their personal belongings, possessions and property.

Different levels and types of empathy of empathy predicted subtypes of antisocial behaviors depending on factors such as how the subtypes of empathy and subtypes of antisocial behaviors have been defined, the kind of research designs used and the nature of the participants (e.g. van Heerebeek, 2010; van Langen, Wissink, van Vugt, Van der Stouwe, & Stams, 2014). No previous study has used emotional reactivity, cognitive empathy and social skills as subtypes of empathy to predict physically

aggressive and non-aggressive behaviors (Smith & McVie, 2003). Moreover the nature of relationship between subtypes of empathy and subtypes of antisocial behaviors in a student sample was expected to reveal the functioning of empathy in various antisocial behaviors. As there were diverse results in the literature (e.g. Ang & Goh, 2010; Lonigro, Laghi, Baiocco, & Baumgartner, 2013; Mayberry & Espelage, 2007) regarding the correlation between subtypes of empathy and subtypes of antisocial behaviors, the direction and significance of relationship between these variables needed to be determined.

As most of the studies (e.g. Kokkinos, Antoniadou, & Markos, 2014; Taubner, White, Zimmermann, Fonagy, & Nolte, 2013; Ttofi, Bowes, Farrington, & Lösel, 2014) showed a negative relationship between subtypes of empathy and subtypes of antisocial behaviors, it was assumed that there would be inverse relationship between these variables. However, the comparison of affective and cognitive empathy in relation to physically aggressive and non-aggressive behaviors in various studies (e.g. Jolliffe & Farrington, 2004; Lunsford, 2014; van Langen et al., 2014; Yeo, Ang, Loh, Fu, & Karre, 2011) suggested that affective empathy/emotional reactivity was more likely to be related to physically aggressive behaviors and cognitive empathy/social skills was more likely to be related to non-aggressive behaviors. Therefore, it was assumed that emotional reactivity may predict physically aggressive behavior while cognitive empathy and social skills (socio-cognitive skills) may predict non-aggressive behaviors.

Furthermore, emotional reactivity, cognitive empathy and social skills as subtypes of empathy were negatively correlated to sensation seeking personality traits (Kokkinos et al., 2014). Sensation seeking was positively associated with subtypes of antisocial behaviors (e.g. Nower, Derevensky, & Gupta, 2004). Some researchers (e.g. Dahlen, Martin, Ragan, & Kuhlman, 2004, 2005; Smart & Victoria, 2003) found a positive relationship between sensation seeking and physically aggressive behaviors and others (e.g. Ball, Carroll, & Rounsaville, 1994; Xu, Raine, Yu, & Krieg, 2014) found a positive relationship between sensation seeking and non-aggressive behaviors. Nevertheless, sensation seeking is a typical marker of adolescence as physiological changes occur at this stage (Shulman, Harden, Chein, & Steinberg, 2014).

While empathy is an other-directed emotion whereby an individual seeks to understand and experience the emotions of others (e.g. Beadle, 2009; Romero-Canyas & Downey, 2013), sensation seeking is a self-directed emotion (e.g. Charnigo et al., 2012; Janson, 1993). Therefore empathy and sensation seeking tendencies may be two opposing emotional forces. However, research did not show how subtypes of empathy interacted with sensation seeking in predicting subtypes of antisocial behaviors. Given that sensation seeking involved pleasure seeking emotions and empathy involved understanding and feeling others emotions, it was important to consider the interplay of contradictory emotions in relation to subtypes of antisocial behaviors.

Sensation seeking was related to both the subtypes of empathy and subtypes of antisocial behaviors. Therefore sensation seeking was considered, in addition to subtypes of empathy, as a predictor variable in a regression model to observe the effects of sensation seeking in predicting subtypes of antisocial behaviors. This was expected to demonstrate whether sensation seeking was more significant than subtypes of empathy in predicting physically aggressive and non-aggressive behaviors,

but also expected to show if the relationship between subtypes of empathy and subtypes of antisocial behaviors changed with the addition of sensation seeking traits in a regression model. Furthermore, if sensation seeking was revealed as a significant predictor or the relationship between subtypes of empathy and subtypes of antisocial behaviors changed due to addition of sensation seeking traits to the regression model, it was worth examining the role of sensation seeking as a moderator between subtypes of empathy and subtypes of antisocial behaviors in order to understand how self pleasing emotions interacted with understanding of others' emotion in predicting subtypes of antisocial behaviors.

Moreover, testing sensation seeking as a moderator was expected to highlight the significance of sensation seeking traits in predicting antisocial behavior even in the presence of empathy. In this context, research (McTernan, Love, & Rettinger, 2014) demonstrated that cognitive empathy and sensation seeking personality traits were differentially related to the subtypes of antisocial behaviors. Although poor cognitive empathy was linked to the non-aggressive behavior while sensation seeking and poor emotional reactivity/affective empathy were related to physically aggressive behaviors (e.g. McTernan et al., 2014; Pursoo, 2013), there was no research which examined the extent to which subtypes of empathy existed in the presence of low sensation seeking versus high sensation seeking traits.

Aims of this study

The first aim of the current study was to examine if the subtypes of empathy i.e. emotional reactivity, cognitive empathy and social skills were inversely related to physically aggressive and non-aggressive behaviors while controlling for age, student status (e.g. home or overseas), and faculty (area of study) amongst university students. The second aim was to find out if emotional reactivity predicted physically aggressive behaviors while cognitive empathy and social skills predicted non-aggressive antisocial behaviors. The third aim was to examine how sensation seeking made a difference to a regression model with subtypes of empathy as predictors of subtypes of antisocial behaviors. The fourth aim was to examine if sensation seeking traits (Zuckerman, Eysenck, & Eysenck, 1978) interacted with emotional reactivity (Lawrence et al., 2004) in predicting physically aggressive behaviors and if sensation seeking interacted with cognitive empathy and social skills in predicting non-aggressive antisocial behaviors (American-Psychiatric-Association, 2000; Rowe et al., 2004).

The following were the hypotheses. **H_1** The subtypes of empathy i.e. cognitive empathy, emotional reactivity and social skills would be inversely related to subtypes of antisocial behaviors i.e. physically aggressive and non-aggressive behaviors; **H_2** Emotional reactivity would predict physically aggressive behaviors while cognitive empathy and social skills would predict non-aggressive behaviors in the regression model including only subtypes of empathy; **H_3** The addition of sensation seeking to subtypes of empathy in the regression model would change the relationship between subtypes of empathy and subtypes of antisocial behavior; **H_4** Sensation seeking would moderate the relationship between subtypes of empathy and subtypes of antisocial behaviors whereby sensation seeking would interact with emotional reactivity in physically aggressive behaviors and sensation seeking would interact with cognitive empathy and social skills in non-aggressive behaviors.

Method

Measures

a. Demographic Variables Questionnaire. The demographic variables consisted of gender, age student status, (i.e. Home, European Union (EU), and non-European status/nationality); and faculty (i.e. Arts and Humanities; Engineering; Medicine, Dentistry, and Health; Science; and Social science) to which the participant belonged at the University of Sheffield (see Participants).

b. Brief Sensation Seeking Scale (BSSS). The Brief Sensation Seeking Scale (BSSS) consisted of 8 items, which measured the construct sensation seeking on a scale of 1-5 where 1 stands for 'Strongly Disagree' and 5 stands for 'Strongly Agree'. It included 8 items such as, "I would like to try bungee jumping" and "I like wild parties" (Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, 2002).

c. The Cambridge Behavior Scale (EQ). The Cambridge behavior scale (Baron-Cohen & Wheelwright, 2004) known as the Empathy Quotient (EQ) had 40 items (for adults). The validity and reliability of this scale had been established (Lawrence et al., 2004). Empathy on the EQ was operationally defined in terms of the total score on the EQ. The score on each item could vary from 1-4 where 1 stood for 'Strongly Agree' and 4 stood for 'Strongly Disagree' on items such as "I find it hard to know what to do in a social situation"; "Seeing people cry doesn't really upset me" and reverse scoring for items such as "I am good at predicting how someone will feel"; "I really enjoy caring for other people".

The subscales of empathy were taken from the three factor structure presented in confirmatory factor analyses in previous studies with 5 items in each subscale (Gouveia et al., 2012; Muncer & Ling, 2006). The three subscales were Emotional reactivity (on items such as "Seeing people cry doesn't really upset me"), cognitive empathy (on items such as "I am good at predicting how someone will feel") and social skills (on items such as "I find it hard to know what to do in a social situation"). The emotional reactivity subscale consisted of item numbers 3, 16, 19, 33 & 39; the cognitive empathy subscale consisted of item numbers 14, 15, 29, 34, & 35; the social skills subscale consisted of item numbers 2, 4, 7, 8, & 21 (Baron-Cohen & Wheelwright, 2004; see Results for reliability coefficients).

d. The Antisocial Behavior Measure. This consisted of 22 items taken from the Edinburgh Study of Youth Transitions and Crime survey (Smith & McVie, 2003). The respondent had to indicate his/her involvement in certain antisocial behaviors such as "Hurt or injured animals or birds on purpose", and "Stolen something from a shop or store". Each item on the Antisocial Behavior Measure was scored on a scale of 1-5 where 1 stood for 'Never' and 5 stood for 'Very Often'.

A conceptual classification of antisocial behaviors was used to distinguish two subscales, which were physically aggressive and non-aggressive behaviors. Reliability analysis was used to confirm this conceptual classification. The physically aggressive behavior subscale consisted of 7 items (item numbers 9, 10, 11, 14, 17, 18, & 19) pertaining to actual or threatened aggression aimed at living things while the non-aggressive behavior subscale consisted of 10 items (item numbers 2, 3, 4, 5, 6, 12, 15,

16, 20, & 22) pertaining to actual or threatened aggression towards non-living things such as others' personal possessions or public property (See Results section for reliability coefficients). The physically aggressive behavior subscale consisted of items such as "Hit, spat, threw stones at someone you know"; "Hurt or injured animals or birds on purpose". The non-aggressive behavior subscale included items such as "Deliberately damaged or destroyed property that did not belong to you"; "Sold an illegal drug to someone"; and Broken into a house or a building to try and steal something".

Participants

A sample of N=540 student volunteers from University of Sheffield, UK aged 17-25 years with a mean age of M = 20.43, SD=2.08 for female participants, and a mean age of M=20.12, SD=1.91 for male participants took part in the study. One of the participants did not fill in the demographic section. Therefore, in a sample of 539 participants 72% (n=390) were female and 28% (n=149) were male participants; 72% (n=391) identified themselves as home students, 9% (n=50) as EU students and 18% (n=99) identified themselves as Non-Europeans; 23% (n=126) were from Faculty of Arts and Humanities, 13% (n-70) from Engineering, 15% (n=83) from Medicine, Dentistry and Health, 27% (n=145) from Science, and 21% (n=114) were from Social Sciences.

Procedure

The ethics committee of Psychology department, University of Sheffield approved this research project. This study used a cross-sectional survey research design. An online survey on Qualtrics software with self-report measures as mentioned above was developed. This survey was sent to the students of University of Sheffield on 31st October 2013 through a university email distribution list consisting of an invitation to the study and a link to the survey. The survey remained active till 29th November 2013. To attract participants, a prize draw of £50 was offered. The data were analyzed using SPSS IBM 21.

Results

Data screening

The variables i.e. the demographic variables, the Brief Sensation Seeking Scale (Zuckerman et al., 1978), Empathy Quotient (Baron-Cohen & Wheelwright, 2004), and the Antisocial Behavior Measure (Smith & McVie, 2003) were then tested for normality. The Shapiro-Wilk normality tests for all the variables in this study were significant ($p<.001$) except for the mean score of sensation seeking ($p=.066$). Therefore, the data were non-normal. An attempt was made to normalize the data through transformation. However, even log and square root transformations did not make any difference to the data; hence it remained non-normal. However, the standardized residuals were normal.

Reliability analyses

The reliability analyses were conducted on the subscales of empathy (See Method section). The subscales of empathy have been confirmed in previous studies (Berthoz et al., 2008; Gouveia et al., 2012; Muncer & Ling, 2006). The three-factor structure consisting of cognitive empathy, emotional reactivity and social skills used in the current study was taken from previous studies (Berthoz et al., 2008; Gouveia et al., 2012; Muncer & Ling, 2006). The reliability analysis indicated a Cronbach's coefficient alpha reliability of 0.82 (N=5) for cognitive empathy, 0.71 (N= 5) for social skills, and 0.59 (N=5) for emotional reactivity.

The reliability analysis for the subscales of the Antisocial Behavior Measure (see Method section and Appendix) was also carried out. The reliability analysis indicated an alpha coefficient of 0.77 (N=7) for physically aggressive behavior, and 0.75 (N= 10) for non-aggressive behaviors. As a result of item deletion process, the items "13-Hit, kicked or punched a brother or sister on purpose", "21-Carried a knife or other weapon with you for protection or in case it was needed in a fight" were deleted from the Physically Aggressive Behaviour subscale and the items "1-Travelled on a bus or train without paying enough money", "7-Ignored someone you know on purpose, or left them out of things" and "8-Said nasty things about someone you know, slagged them off or called them names" were deleted from the Non-Aggressive Behavior subscale.

Spearman rank correlational tests were conducted to find out if subtypes of empathy have an inverse relationship with subtypes of antisocial behaviors. Following are the results.

Inferential Statistics

Table 1. Correlations between subtypes of empathy and subtypes of antisocial behaviors. (N= 540)

Measure	Emotional reactivity	Cognitive empathy	Social Skills	Physically aggressive behavior	Non-aggressive behaviors
Emotional reactivity	-				
Cognitive empathy	**.36****	-			
Social Skills	**.33****	**.46***	-		
Physically aggressive behavior	**-.20****	**-.10***	**-.16****	-	
Non-aggressive behaviors	**-.21****	**-.09***	**-.12****	**.50****	-

Note. Correlation was significant at the 0.01 level (2-tailed).**
Correlation was significant at the 0.05 level (2-tailed).*

Table 1 shows that all three subtypes of empathy had a significant negative correlation with both subtypes of antisocial behaviors.

Regression Analysis was conducted to find out which subtypes of empathy predicted which subtypes of antisocial behaviors while controlling for age, student status (Home, EU, or Non-EU) and faculty (area of study) as covariates. The findings were as follows.

Table 2. Simple regression showing subtypes of empathy in predicting subtypes of antisocial behavior. (N=540)

Variable			**Physically aggressive** R^2**=. 059**		
	B	SE(B)	β	*t*	Sig. (p)
Emotional Reactivity	-.091	.021	-.196	-4.261	**.000**
Cognitive empathy	-.001	.022	-.003	-.060	**.952**
Social Skills	-.035	.019	-.088	-1.797	**.073**
Variable		**Non-Aggressive** R^2**=. 047**			
	B	SE(B)	β	*t*	Sig. (p)
Emotional Reactivity	-.068	.018	-.173	-3.728	**.000**
Cognitive empathy	-.001	.019	-.002	-.038	**.970**
Social Skills	-.028	.016	-.086	-1.732	**.084**

Note. p<.001

Table 2 shows that only emotional reactivity as an empathy subtype negatively predicted physically aggressive and non-aggressive behaviors.

Then sensation seeking was added to the regression model consisting of subtypes of empathy predicting physically aggressive and non-aggressive behaviors as shown below.

Table 3. Simple regression showing subtypes of empathy and sensation seeking traits in predicting subtypes of antisocial behavior. (N=540)

Variable			**Physically aggressive** R^2**=.074**		
	B	SE(B)	β	*t*	Sig. (p)
Sensation seeking	.039	.013	.127	2.997	**.003**

Emotional Reactivity	-.083	.021	-.179	-3.875	**.000**
Cognitive empathy	-.004	.022	-.009	-.185	**.854**
Social Skills	-.041	.019	-.105	-2.141	**.033**
Variable		**Non-Aggressive R^2=.092**			
	B	SE(B)	β	*t*	Sig. (p)
Sensation seeking	.056	.011	.214	5.121	**.000**
Emotional Reactivity	-.056	.018	-.143	-3.130	**.002**
Cognitive empathy	-.005	.018	-.012	-.250	**.803**
Social Skills	-.038	.016	-.114	-2.346	**.019**

Note. p<.001, *p*<.05

Table 3 shows that sensation-seeking traits were a positive predictor, whereas emotional reactivity and social skills was a negative predictor of both physically aggressive and non-aggressive behaviors.

Sensation seeking emerged not only as a predictor of physically aggressive and non-aggressive behaviors but the inclusion of sensation seeking in the regression model changed the relationship between subtypes of empathy and subtypes of antisocial behaviors. Social skills became a predictor of both physically aggressive and non-aggressive behaviors in the presence of sensation seeking traits. Therefore the role of sensation seeking traits as a moderator was examined in a 2 way ANOVA.

Table 4. A two way ANOVA showing sensation seeking as a moderator between subtypes of empathy and subtypes of antisocial behavior. (N=540)

Effect	**Physically aggressive behavior**		**Non-aggressive behavior**		***df***
	F	*p*	*F*	*p*	
Sensation seeking × Emotional reactivity	3.38	**.04**	2.87	**.06**	2
Sensation seeking × Cognitive empathy	1.83	**.16**	4.26	**.02**	2
Sensation seeking × Social skills	4.29	**.01**	3.64	**.03**	2

Note. p<.05

Table 4 shows an interaction between sensation seeking and emotional reactivity for physically aggressive behaviors (Figure 1) but no interaction between sensation seeking and emotional reactivity for non-aggressive behaviors (Figure 2).

There was an interaction between sensation seeking and cognitive empathy for non-aggressive behaviors (Figure 4) but no interaction between sensation seeking and cognitive empathy for physically aggressive behaviors (Figure 3).

There was an interaction between sensation seeking and social skills for both physically aggressive (Figure 5) and non-aggressive behaviors (Figure 6).

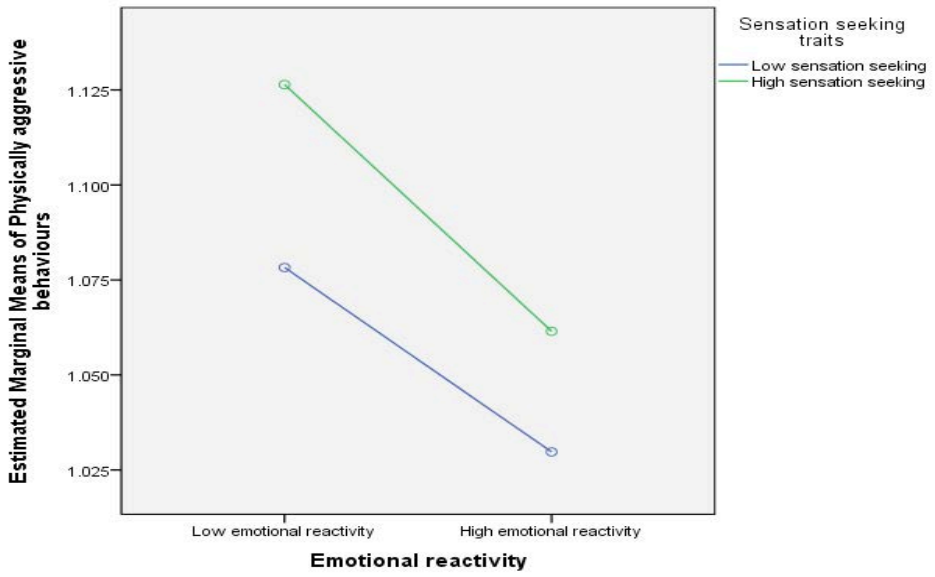

Figure 1: Sensation seeking with emotional reactivity in predicting physically aggressive behaviors

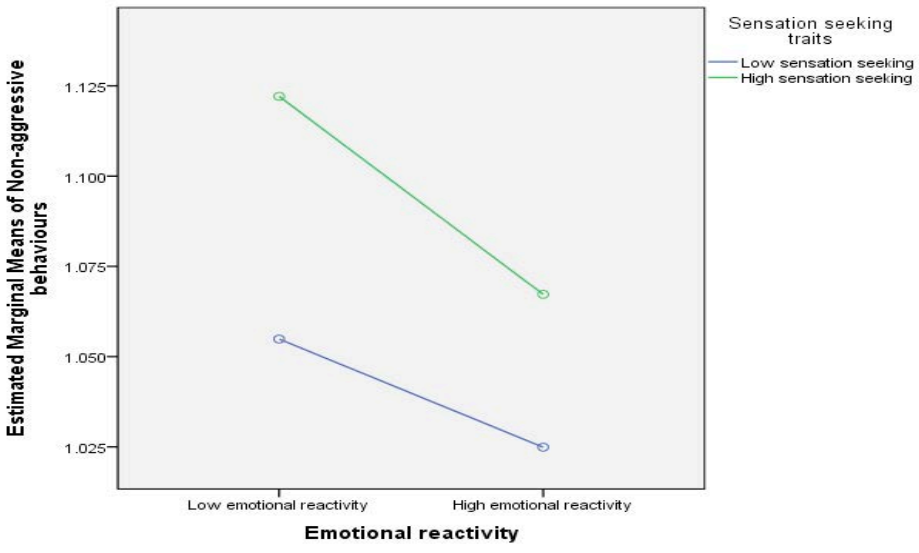

Figure 2: Sensation seeking with emotional reactivity in predicting non-aggressive behaviors

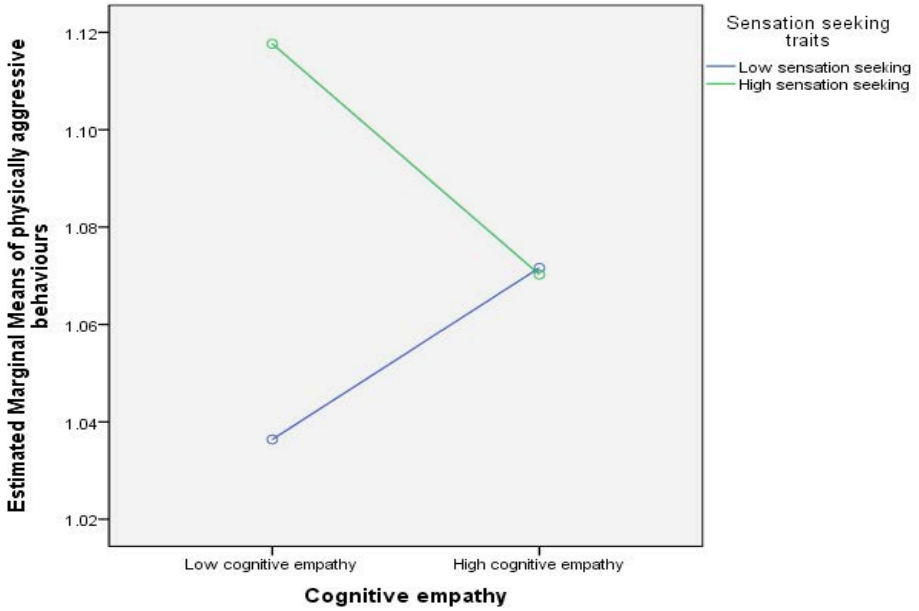

Figure 3: Sensation seeking with cognitive empathy in predicting physically aggressive behaviors

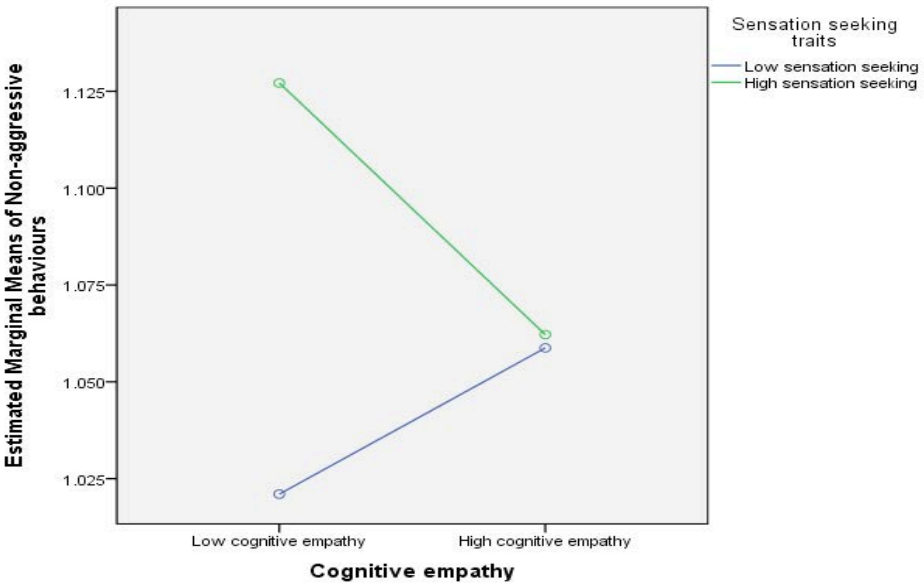

Figure 4: Sensation seeking with cognitive empathy in predicting non-aggressive behaviors

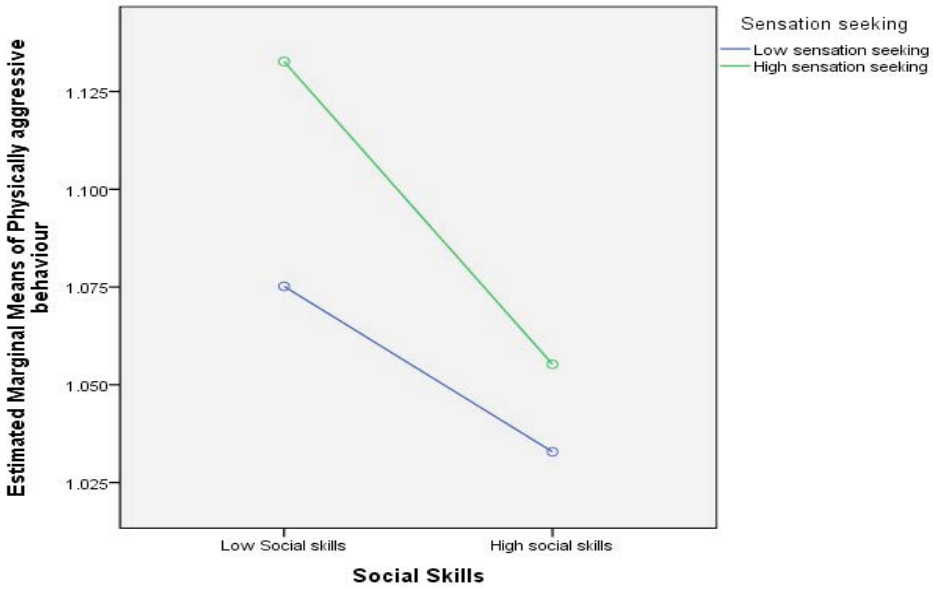

Figure 5: Sensation seeking with social skills in predicting physically aggressive behaviors

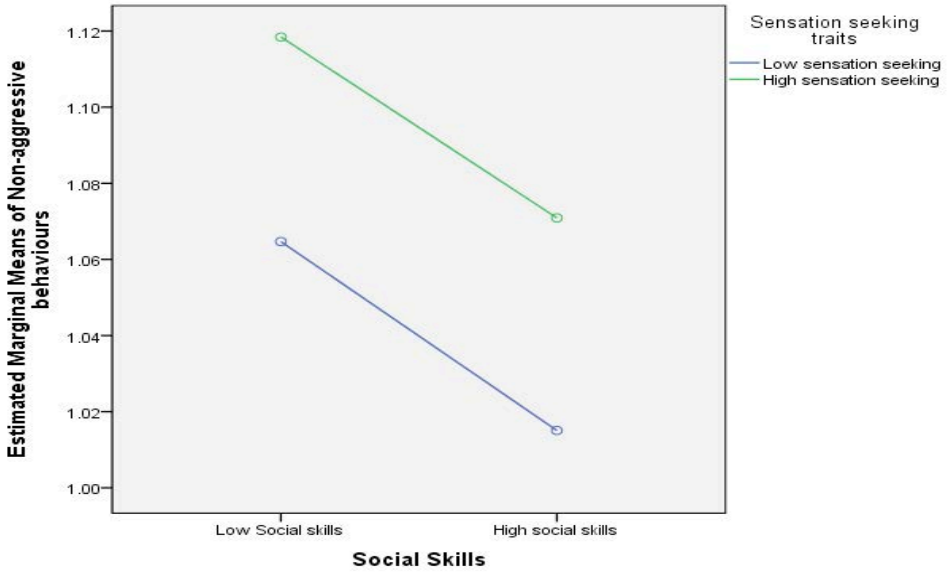

Figure 6: Sensation seeking with social skills in predicting non-aggressive behaviors

Discussion

The first hypothesis $\mathbf{H_1}$ that subtypes of empathy i.e. cognitive empathy, emotional reactivity and social skills would be inversely related to subtypes of antisocial behaviors i.e. physically aggressive and non-aggressive behaviors was supported (Table 1). The second hypothesis $\mathbf{H_2}$ that emotional reactivity would predict physically aggressive behaviors while cognitive empathy and social skills would predict non-aggressive behaviors in a regression model including only subtypes of empathy was partially supported (Table 2) because of all the subtypes of empathy in

the regression model only emotional reactivity predicted physically aggressive and non-aggressive behaviors. The third hypothesis that **H_3** that the addition of sensation seeking to subtypes of empathy in the regression model would change the relationship between subtypes of empathy and subtypes of antisocial behavior was supported. Social skills predicted physically aggressive and non-aggressive behaviors in addition to emotional reactivity and sensation seeking when sensation seeking was added to the regression model (Table 3). The fourth hypothesis **H_4** that sensation seeking would moderate the relationship between subtypes of empathy and subtypes of antisocial behaviors, whereby sensation seeking interacts with emotional reactivity in physically aggressive behaviors; and sensation seeking interacts with cognitive empathy and social skills in the non-aggressive behaviors; was partially supported (Table 4, Figures 1-6).

High sensation seeking interacted with low emotional reactivity and low social skills in predicting physically aggressive behavior (Figures 1 & 5). High sensation seeking also interacted with low social skills and low cognitive empathy in predicting non-aggressive behaviors (Figure 4 & 6). However, low sensation seeking interacted with high cognitive empathy in non-aggressive behaviors (Figure 4).

Relationship between subtypes of empathy and subtypes of antisocial behaviors (Table 1; First hypothesis)

The Spearman rank correlations showed that subtypes of empathy i.e. emotional reactivity, cognitive empathy and social skills, had an independent inverse correlation with physically aggressive and non-aggressive behaviors (Table1). This finding corresponds to previous studies (e.g. Kokkinos et al., 2014; Shechtman, 2002; Vitaro, Brendgen, & Barker, 2006) which have also shown an inverse relationship between subtypes of empathy and subtypes of antisocial behaviors.

We note that these findings indicate that the direction of relationship was inverse for all three subtypes of empathy in relation to physically aggressive behaviors, i.e. aggression against living things.

Moreover, we note that the direction of relationship was also inverse for all three subtypes of empathy in relation to non-aggressive behaviors, i.e. aggression against other people's possessions.

The results showed that low levels of empathy were associated with antisocial behaviors regardless of the subtype of empathy or subtype of antisocial behavior. Nevertheless, all subtypes of empathy were not equally important in predicting physically aggressive and non-aggressive behaviors. Emotional reactivity had a higher correlation to both physically aggressive and non-aggressive behaviors followed by social skills and cognitive empathy. Therefore, emotional reactivity was the most important subtype of empathy and cognitive empathy was the least important subtype of empathy in relation to subtypes of antisocial behaviors. This finding supported previous studies (e.g. Aaltola, 2013; de Kemp, Overbeek, de Wied, Engels, & Scholte, 2007; Jolliffe & Farrington, 2006, 2007, 2011; Maurage et al., 2011; Shechtman, 2002).

However, the current results contradicted some previous findings (e.g. Ang & Goh,

2010; Mayberry & Espelage, 2007; Milojević & Dimitrijevic, 2014), which showed a positive correlation or no correlation of empathy subtype to antisocial behavior subtypes. Those studies found different results from the current study probably because they had different definitions for aggressive behaviors or a different population of youth. For instance, there was a different definition of aggressive and non-aggressive behaviors. Aggressive behavior referred to proactive and reactive aggression subtypes and non-aggressive behavior referred to uninvolved youth (Mayberry & Espelage, 2007). In another example, the sample consisted of juvenile offenders (Milojević & Dimitrijevic, 2014) instead of university students. Similarly, gender could affect the relationship between a certain subtype of empathy and antisocial behaviors. For example, cognitive empathy was the same for groups with high and low levels of cyberbullying for female participants (Ang & Goh, 2010).

Moreover, it should be noted that the significant correlations in the current study were low. Therefore strong conclusions regarding the relationship between subtypes of empathy and subtypes of antisocial behaviors cannot be made.

Subtypes of empathy as predictors of subtypes of antisocial behaviors in the regression model (Table 2, Second hypothesis)

Previous research (Kokkinos et al., 2014) revealed an inverse relationship between emotional reactivity and cyberbullying which is a type of non-aggressive behavior. The current research added to the literature by demonstrating that emotional reactivity is inversely related to both physically aggressive (antisocial behaviors targeted against people/animals) and non-aggressive behaviors (antisocial behavior targeted against objects). Amongst all the subtypes of empathy, only emotional reactivity appeared as the inverse predictor of both physically aggressive and non-aggressive behaviors. This not only revealed the significance of emotional reactivity as a predictor of antisocial behaviors, but also revealed that low levels of emotional reactivity amongst university students predicted antisocial behavior, regardless of the antisocial behavior subtype.

The nature of the two subtypes of antisocial behaviors as defined in the current study did not involve any romantic aggression, relational aggression, neutral or docile behavior. Both subtypes of antisocial behaviors involved actual, threatened, serious and deliberate criminal acts, which could for example include rule breaking, abuse or violence. Therefore the definitions of antisocial behavior subtype i.e. whether it refers to aggression against living things or aggression against property of others should be kept in mind before interpreting the relationship between emotional reactivity and antisocial behavior subtypes.

The current findings corroborated previous literature (Aaltola, 2013; Shechtman, 2002) which showed an inverse relation of affective empathy to subtypes of antisocial behaviors. However, the current findings contradicted studies (e.g. Dadds et al., 2009; Domes, Hollerbach, Vohs, Mokros, & Habermeyer, 2013; Hosker-Field, 2011; Milojević & Dimitrijevic, 2014; van Heerebeek, 2010), which did not find any relationship or a positive relationship of affective empathy to physically aggressive and non-aggressive behaviors. The reason for this contradiction might be attributed to the different definitions of subtypes of empathy and subtypes of antisocial behaviors as well as the different demographic characteristics of the participants in the literature.

Sensation seeking and Subtypes of empathy as predictors of subtypes of antisocial behaviors in the regression model (Table 3, Third Hypothesis)

Sensation seeking traits emerged as a predictor in addition to emotional reactivity in the regression model. Past research (e.g Kokkinos et al., 2014) showed the relationship of subtypes of empathy to both non-aggressive behaviors and subtypes of sensation seeking but it did not show the competing effects of sensation seeking traits with subtypes of empathy in predicting both physically aggressive and non-aggressive antisocial behaviors. The present study showed the relative position of sensation seeking when it was included as a predictor of physically aggressive and non-aggressive behaviors in addition to subtypes of empathy as predictors.

While sensation seeking traits were the strongest predictor of non-aggressive behaviors followed by emotional reactivity and social skills; emotional reactivity was the strongest predictor of physical aggressive behavior, followed by sensation seeking and social skills. Sensation seeking emerged as a significant predictor of physically aggressive and non-aggressive behaviors in addition to emotional reactivity. However, low emotional reactivity superseded sensation seeking in physically aggressive behaviors while sensation seeking superseded low emotional reactivity in non-aggressive behaviors.

Moreover, it must be noted that social skills were not significant in the absence of sensation seeking traits in the previous regression model (Table 2). However, social skills became a significant predictor of physically aggressive and non-aggressive behaviors in the regression model with sensation seeking traits. This might have occurred due to the relationship between sensation seeking and social skills, which was beyond the scope of this study. Furthermore, akin to sensation seeking, low levels of social skills were significant in non-aggressive behaviors as compared to physically aggressive behaviors.

The finding that low social skills predicted non-aggressive behaviors while low emotional reactivity predicted physically aggressive behaviors was in line with previous studies (see Table 3; e.g. Jolliffe & Farrington, 2004; Lunsford, 2014; van Langen et al., 2014; Xu et al., 2014; Yeo et al., 2011). Nevertheless, the addition of sensation seeking to the regression model changed the relative levels of significance of the subtypes of empathy in predicting subtypes of antisocial behaviors.

As sensation seeking changed the regression model, it was worth examining the interaction between sensation seeking and subtypes of empathy in predicting subtypes of antisocial behaviors.

The interaction of sensation seeking with subtypes of empathy in predicting subtypes of antisocial behaviors in the regression model (Table 4, Figures 1-6, Fourth hypothesis)

Previous studies (e.g. McTernan et al., 2014; Pouw, Rieffe, Oosterveld, Huskens, & Stockmann, 2013; Pursoo, 2013; Yeo et al., 2011) identified emotional reactivity and sensation seeking as predictors of aggressive behaviors, and cognitive empathy as a predictor of non-aggressive behaviors. The interaction analyses in the current study supported these past findings by showing that high sensation seeking interacted with

low levels of emotional reactivity in predicting physically aggressive behaviors (Figure 1), and high sensation seeking interacted with low cognitive empathy in predicting non-aggressive behaviors (Figure 4).

Sensation seeking also changed the direction of relationship between cognitive empathy and non-aggressive behavior. At low sensation seeking, there was a positive relationship between cognitive empathy and non-aggressive behavior but at high sensation seeking there was an inverse relationship between cognitive empathy and non-aggressive behavior (Figure 4). This meant that low sensation seekers understood others' state of mind and still engaged in non-aggressive behaviors while high sensation seekers had low levels of understanding of others' state of mind when they engaged in non-aggressive behavior. This implied that sensation seeking might not be the primary reason for those with a high level of cognitive empathy. Therefore, another hidden variable might be motivating individuals with high cognitive empathy and low sensation seeking traits to engage in non-aggressive behaviors. However, sensation seeking might be a potential excuse for those with low levels of cognitive empathy for engaging in non-aggressive behaviors.

Moreover this study revealed that high sensation seeking interacted with low social skills in predicting physically aggressive behaviors (Figure 5). This finding was against expectations because social skills had a higher significance level in predicting non-aggressive behaviors as compared to predicting physically aggressive behaviors in the non-interactive model consisting of all the variables including sensation seeking traits. Although low social skills can be associated with antisocial behaviors (Buck, 2013; Ttofi et al., 2014), there is limited evidence regarding the specific relationship of social skills to physically aggressive and non-aggressive behaviors. On the other hand past findings (Dahlen et al., 2004; McTernan et al., 2014), have only shown the involvement of high sensation seeking in aggressive behaviors. The current study added to the literature by showing that high sensation seeking interacted with low social skills in physically aggressive behaviors (Figure 5). Moreover, this study showed that low sensation seeking interacted with low social skills in non-aggressive behaviors (Figure 6).

The comparison between the non-interactive model and the interactive model of sensation seeking with subtypes of empathy in predicting physically aggressive and non-aggressive behaviors

When a comparison between the interactive model (Table 4) was made with the non-interactive model (Table 3) of sensation seeking traits, the non-interactive model shows sensation seeking, emotional reactivity and social skills as predictors of physically aggressive and non-aggressive behaviors.

However, in the interactive model, in addition to other variables cognitive empathy also emerges as a predictor of non-aggressive behavior. This was an important finding as it revealed that even though cognitive empathy did not emerge as a significant predictor in the non-interactive model, it was significant in the interactive model. This suggests the covert significance of cognitive empathy in non-aggressive behaviors.

On the other hand non-interactive model displayed social skills as a more significant predictor of non-aggressive behaviors than of physically aggressive behaviors. The

interactive model supported the finding of the non-interactive model by demonstrating the relative position of sensation seeking with social skills in physically aggressive and non-aggressive behaviors. Thus low social skills interacted with high sensation seeking in predicting physically aggressive behaviors while low social skills interacted with low sensation seeking in predicting non-aggressive behaviors. Although social skills were low in both antisocial behavior subtypes, the levels of sensation seeking varied while interacting with social skills with low levels of sensation seeking in non-aggressive behaviors. Thus these findings suggested whether or not social skills interacted with sensation seeking, social skills might be of greater significance in non-aggressive behaviors than in physically aggressive behaviors.

Nevertheless, the interactive model gives a better view of interactions between subtypes of empathy and sensation seeking in subtypes of antisocial behaviors.

Limitations

One limitation was that reliability analysis revealed low correlations for two of the items in the emotional reactivity subscale which were "If I say something that someone else is offended by, I think that that's their problem, not mine" and "I usually stay emotionally detached when watching a film." Therefore by excluding these two items the alpha coefficients increased from .59 to .63. Nevertheless, these two items were retained according to the confirmatory factor analysis conducted in previous studies (e.g. Berthoz et al., 2008; Gouveia et al., 2012; Muncer & Ling, 2006). However, even these studies (i.e.Berthoz et al., 2008; Gouveia et al., 2012; Muncer & Ling, 2006) reported low alpha coefficients for these two items.

Conclusion and Implications

The current study demonstrated the significance of subtypes of empathy alone as well as sensation seeking traits with subtypes of empathy in predicting physically aggressive and non-aggressive behaviors. Thus, this study highlighted how opposing emotions i.e. sensation seeking and subtypes of empathy interacted in different types of antisocial behaviors. Emotional reactivity emerged as the most significant predictor of antisocial behaviors regardless of the subtype of antisocial behavior. While sensation seeking emerged as a significant predictor of physically aggressive and non-aggressive behaviors, it moderated the relationship between subtypes of empathy and subtypes of antisocial behaviors.

The current study would be useful in informing theory and practice that high sensation seeking with low emotional reactivity, and high sensation seeking with low social skills are involved in physically aggressive behaviors whereas high sensation seeking with low cognitive empathy, low sensation seeking with high cognitive empathy and low sensation seeking with low social skills are involved in non-aggressive behaviors. Keeping in view these distinctive interactions between sensation seeking and subtypes of empathy in physically aggressive and non-aggressive behaviors, different interventions might be needed for youth involved in physically aggressive behaviors and youth involved in non-aggressive behaviors.

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The Effect of Social Exclusion on Color Preferences

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Abstract

The current study examined the effects of social exclusion on color preference. Previous researches have suggested that people are more likely to choose hot food when they feel lonely than to choose cold food when they feel sociable. We hypothesized that participants who recalled social exclusion experiences are more likely to prefer warm colors than cool colors compared to participants who recalled social inclusion experiences. Fifty-two undergraduates participated in the present study. A 2 x 2 mixed factorial design is used to manipulate independent variables - social exclusion (included group/excluded group) and color category (warm colors/cool colors) - and we measured color preference. There were 52 participants, half of the participants were asked to recall a social exclusion experience and the other half were asked to recall a social inclusion experience. After that, a total eight color stimulus were given and the participants were asked to rate their color preferences. In our results, people who recalled a social exclusion experience prefer cool colors over warm colors. Also, the tendency of a preference in the social exclusion group was significantly higher compared to that in the social inclusion group. It seems that social exclusion impairs self-regulation. Thus, it triggers distorted time perception which causes an emphasis on the present, rather than the future. Therefore, the excluded group tended to maintain the situations and exhibited a preference for cool over warm colors.

Introduction

Color influences people's feelings and behavior in an unconscious way. While there are huge individual differences in color preferences, universal preferences with regard to color are also observed (Ou, Luo, Woodcock, & Wright, 2004). For example, there are color standards for interior design, visual communication design, product design, fashion design, and so on (Korean Society of Color Studies, 2009). The existence of these standards for color design opens up the possibility that color may help people who suffer from psychological pain.

Social exclusion has come to the fore these days. At school, at work, even at home — everywhere many people suffer from social exclusion. Social exclusion is very painful to all social animals, including humans (Zhong & Leonardelli, 2008). Furthermore, social exclusion caused by other people induces anxiety and depression and activates the brain domain responsible for physical pain (Coie, Terry, Zakriski, & Lochman, 1995; Eisenberger, Lieberman, & Williams, 2003). Therefore, if color can help people who feel socially excluded, an examination of the tendencies in color preferences is necessary. When people see a cool color, they recall positive emotions; therefore, a general preference for cool colors is higher than that for warm colors (Ou et al., 2004). In this study, we expect that there are some general preferences for color, regardless of considerable individual differences. Another expectation is that specific visual functions, such as colors, can trigger different moods.

Zhong and Leonardelli (2008) compared self-reported measurements of room temperature between the social exclusion group and social inclusion group. Their results suggest that the social exclusion group evaluated room temperature to be lower than the inclusion group did. Also, according to Zhong and Leonardelli (2008), when people feel socially excluded, they show a preference for warm food and drinks. The authors conclude that social exclusion is related to temperature. In the present study, we expect that this tendency in preferences will also manifest itself with regard to color. Specifically, our expectation is that the participants primed on social exclusion would prefer warm colors to cool color. Thus, which means the colors that are generally assumed to be warm (such as red, yellow, and orange) would be preferred by socially excluded group.

Participants

The participants were 52 undergraduate students at Yonsei University. To rule out the possibility of culture-specific biases, respondents from the same cultural group, Koreans, were recruited.

Materials

The color samples were taken from the NCS (Natural Color System) and the sample size was 500-px for both width and height. The following eight hue groups from the NCS were used: yellow, yellow-20-red, yellow-60-red, red, blue, blue-10-green, red-80-blue, red-90-blue.

Procedure

In the first step, the participants took a simple color-blindness test. The social exclusion group (50% of the participants) was asked to recall a social exclusion experience and the social inclusion group (the other 50%) was asked to recall a social inclusion experience. All participants were provided with a questionnaire to recall their experiences. Priming items included questions such as "When did you feel socially excluded?", "Where did you experience social exclusion?", "At that time, who was with you?", "How much did you feel social exclusion during that experience?" Afterwards, a total of eight color stimuli (four warm colors, four cool colors) were randomly displayed on the monitor and the participants were asked to rate their color preferences by using a 7-point Likert scale (from 1 = 'least' to 7 = 'most').

Results

The data analyzed by 2 (group: social exclusion vs. social inclusion) x 2 (color categories: warm vs. cool) repeated-measure ANOVA. There was no main effect in group, $F(1, 50) = 0.08$, *ns*. The preference for color was different by color categories, $F(1, 50) = 25.76$, $p < .05$. Also, the interaction between group and color was significant, $F(1, 50) = 4.14$, $p < .05$.

Table 1. Descriptive statistics for group and color categories

	Mean	SD	N
Exclusion, warm	3.89	0.86	26
Exclusion, cool	5.09	1.01	26
Inclusion, warm	4.23	0.89	26
Inclusion, cool	4.75	1.00	26

The interaction was significant, so we used a paired t-test to analyze it. In social exclusion group, there was a significant difference on color categories, $t(25) = -4.60$, $p < .05$. In other words, the participants manipulated for social exclusion tended to prefer cool colors ($M = 5.09$, $SD = 1.01$) over warm colors ($M = 3.89$, $SD = 0.86$). Also, there was a significant result on color categories in social inclusion group, $t(25) = -2.52$, $p < .05$. Thus, the participants manipulated for social inclusion tended to prefer cool colors ($M = 4.75$, $SD = 1.00$) over warm colors ($M = 4.23$, $SD = 0.89$). Therefore, regardless of the group, all participants preferred cool colors, but the tendency for a preference in the social exclusion group was higher than in the inclusion group (see Fig. 1).

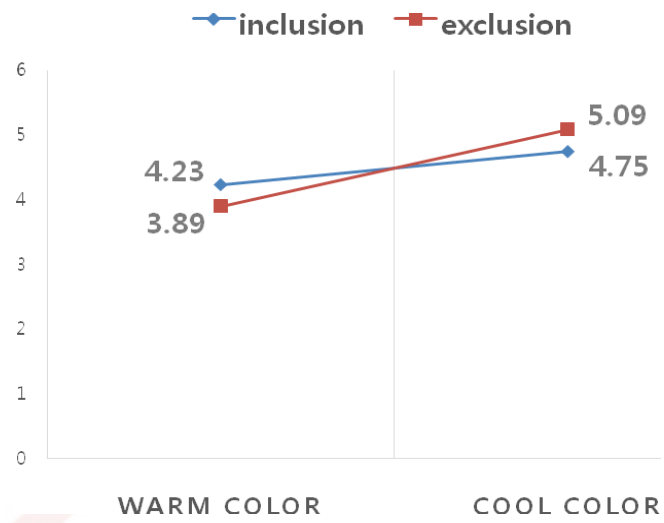

Figure 1. Color preferences at groups and color categories.

Conclusion

The results of the present experiment shows that people who recalled a social exclusion experience prefer cool colors over warm colors. Also, the tendency of a preference in the social exclusion group was significantly higher compared to that in the social inclusion group. These findings contradict our expectation that the color preference for warm colors would occur in the socially excluded group. These results are also inconsistent with a previous study where people who felt socially excluded preferred warm food (Zhong & Leonardelli, 2008).

There are several explanations to the pattern observed in the results. First, we used the stimuli that are different from those used in Zhong & Leonardelli's (2008) study. These stimuli might be felt differently by the participants, because warm food or drinks are perceived with tactile sense, while colors are perceived through a psychological process. In other words, feeling the temperature of colors occurs through a mental process rather than a physical feeling. Also, according to Ou and Luo(2004), there is a general preference for the blue color by people, even infants or animals like monkeys and pigeons (Bornstein, 1975; Humphrey, 1972; Sahgal & Iverson, 1975; Sahgal, Pratt, & Iverson, 1975; Teller, Civan, & Bronson-Castain, 2004; Zemach, Chang, & Teller, 2007). Thus, the obtained pattern of results might have emerged because people manipulated for social exclusion felt pain caused by recalling a social exclusion experience, which they attempted to alleviate by presenting their preferences for cool colors. Another possibility is an impairment of self-regulation. Previous research revealed that social exclusion impairs self-regulation (Baumeister, DeWall, Ciarocco, & Twenge, 2005). Thus, it triggers distorted time perception which causes an emphasis on the present, rather than the future, so it can be assumed that a failure of self-regulation induced a preference for cool colors. Therefore, participants who recalled social exclusion experiences failed at self-regulation and they might have tended to maintain their current state of mood.

The results of our study show that cool colors were preferred over warm colors by all groups. However, our results cannot account for a potential influence of mood on the participants' preference for colors. Also, while we did not analyze gender differences,

gender-stereotyped preferences for different colors might have influenced to our results. Therefore, in future research, gender differences for colors have to be discussed.

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