

Relations Between Visual Perception and Working Memory Through Urban Sketches at Phumin-Ta Li Community, Nan Province

Tawipas Pichaichanarong, Suan Sunandha Rajabhat University, Thailand
Solos Punakabutra, King Mongkut's Institute of Technology Ladkrabang, Thailand

The Asian Conference on Education & International Development 2023
Official Conference Proceedings

Abstract

The study explores the relationship between visual perception and working memory through the medium of urban sketching at Phumin - Ta Li community in Nan province, Thailand. The research involved participants sketching various buildings and landmarks in the community while completing working memory tasks. The sketches and working memory task results were analysed to investigate the connection between visual perception and working memory. The findings suggest that the act of sketching can enhance an individual's visual perception and working memory. Furthermore, this study adds to the understanding of how urban sketching can be used as a tool to improve cognitive processes and a medium to record and remember the urban environment. The results of the study suggest that the act of sketching can serve as a means of enhancing one's memories about sense of place and working memory in visualisation research. The findings also indicate that Phumin-Ta Li community is characterised by a sense of place and a rich cultural heritage that is not closely connected to the residents but also recognized by the visitors. The study provides insights into the potential of urban sketching as a tool for understanding the relationship between visual perception, working memory, and sense of place. The research concludes with some recommendations for future research, including the use of various methods of data collection in order to validate the findings and to expand the understanding of visual perception and working memory in different contexts.

Keywords: Visual Perception, Working Memory, Place Memory

iafor

The International Academic Forum

www.iafor.org

Introduction

Visual perception and working memory are both important cognitive processes that play a crucial role in our ability to navigate and interact with the environment around us. Visual perception refers to the process by which individuals interpret and organize sensory information from the environment to create a meaningful representation of the world, while working memory involves the temporary storage and manipulation of information that is necessary for ongoing cognitive tasks. Studies have shown that visual perception and working memory are closely related, with working memory playing a critical role in the ability to maintain and manipulate visual information (Luck & Vogel, 2013). However, the nature of this relationship is complex and may be influenced by a variety of factors, including the nature of the visual stimuli and the task demands placed on the individual. In the present study, we aim to explore the relationship between visual perception and working memory through the analysis of urban sketches created by residents of the Phumin-Ta Li community in Nan province. Urban sketches are an ideal medium for investigating this relationship, as they require the integration of visual perception and working memory to capture the unique features and characteristics of the urban environment. By examining the characteristics of the urban sketches created by community residents, we hope to gain a deeper understanding of the relationship between visual perception and working memory in the context of urban environments.

Visual Perception

Visual perception and working memory are both important cognitive processes that play a crucial role in our ability to navigate and interact with the environment around us. Visual perception refers to the process by which individuals interpret and organize sensory information from the environment to create a meaningful representation of the world, while working memory involves the temporary storage and manipulation of information that is necessary for ongoing cognitive tasks. Studies have shown that visual perception and working memory are closely related, with working memory playing a critical role in the ability to maintain and manipulate visual information (Luck & Vogel, 2013). However, the nature of this relationship is complex and may be influenced by a variety of factors, including the nature of the visual stimuli and the task demands placed on the individual.

Working Memory

Working memory is a cognitive system responsible for temporarily holding and manipulating information that is needed for ongoing mental tasks (Baddeley, 2012). Drawing is a complex visual and spatial task that involves multiple working memory processes, such as visual perception, spatial planning, and mental manipulation of visual information (Kozbelt & Seidel, 2006). Working memory is critical for drawing because it allows artists to remember the features and details of their subject and mentally manipulate the image as they create it (Kozbelt & Seidel, 2006).

Place Memory

Place memory refers to the way in which individuals associate memories with specific locations or places. This connection between memories and a sense of place has been widely studied and documented in various fields, including psychology, geography, and urban studies. For example, Lewicka's study (2011) examined the relationship between place

attachment and memories, finding that individuals who were more attached to a particular place tended to have stronger memories associated with it. Additionally, the study found that memories associated with a place could influence an individual's emotional attachment to that place. Similarly, a study by Bolliger and colleagues (2020) explored the relationship between spatial cognition and autobiographical memory, and found that individuals with stronger spatial cognition tended to have more detailed and vivid memories associated with specific locations.

Urban Sketches and Illustrate Showcase

As part of the study, the researcher created urban sketch images to assist in presenting questions to participants about the research findings. These sketches were identified as figures 2 and 3. Within the collection of images representing the Phumin-Ta Li community in Nan province, Figure 1 featured a photograph taken by the researcher, highlighting Wat Phumin, Nan province.



Figure 1: *Wat Phumin*

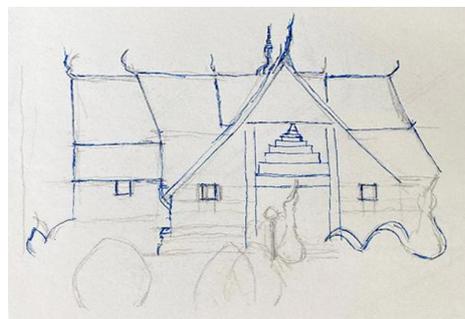


Figure 2: *Urban Sketch of Wat Phumin No.1*



Figure 3: *Urban Sketch of Wat Phumin No.2*

Methodology

The sketcher used interviewing to obtain information on his artworks and to observe expressions from the participant to understand the relationship between visual perception, working memory, and place memory. Meanwhile, Solos Punakabutra, a lecturer from King Mongkut's Institute of Technology Ladkrabang, Thailand, has imparted music aesthetics to the sketcher as figure 4. In addition, the sketcher used the picture interview method, which refers to a type of interview technique that uses images to ask questions to the participant as figure 2 and 3. This technique is designed to encourage the participant to provide more information and comprehensive responses than he or she has done before. According to Braun and Clarke (2019), picture interview methods are particularly useful in qualitative research as he or she can help the researcher to understand how he or she interprets and makes sense of the drawing of Wat Phumin into some valuable information. To illustrate her point, the researcher showed a drawing of Wat Phumin online to the participant as figure 5. The researcher used picture interview methods to ask a participant, this exhibit shows two drawings of Wat Phumin and asking them to discuss what he or she saw, how he or she felt about the drawing and what thoughts or memories he or she evokes. A selected participant to the research is a female who comes from Nan province. She is 36 years old. She works for a government sector in Bangkok. The following conversation is shown.

Researcher: Can you tell us about your recent experience with two drawings of Wat Phumin and Phumin-Ta Li community in Nan province?

Participant: Yes, of course. I recently had the opportunity to view two beautiful drawings of Wat Phumin and Phumin-Ta Li community in Nan province. The drawings were incredibly detailed and captured the essence of the area's unique architecture and culture.

Researcher: Can you tell us more about this relationship?

Participant: Yes, certainly. I have a deep connection with the historical area of Nan, and in particular, the people who lived in Phumin-Ta Li community. Although I do not live there, I have a passion for exploring and learning about different cultures and histories, and this has led me to develop a strong affinity for this community.

Researcher: Can you tell us more about your connection to this historical area?

Participant: Of course. I have visited the area numerous times and have studied the history of the region extensively. One of the things that have captivated me about Phumin-Ta Li community is the unique relationship between the community and the Wat Phumin temple. This temple is a central part of the community, and it has played an important role in the lives of the people who live there for centuries.

Researcher: How would you describe this relationship between the community and the temple?

Participant: The relationship between Phumin-Ta Li community and Wat Phumin is a special one. The temple is not just a place of worship; it is also a hub of social activity and a symbol of the community's identity. The people of Phumin-Ta Li have a deep connection to the temple, and they have worked hard to maintain its historical and cultural significance. For me, this relationship between the community and the temple is a testament to the resilience and strength of the people who live there.

Researcher: It sounds like you have a lot of admiration for the people of Phumin-Ta Li community.

Participant: Yes. The people of this community have a rich history and a unique cultural identity. Despite facing numerous challenges over the years, they have managed to preserve their traditions and way of life.

Researcher: Can you describe one of the drawings and the feeling it conveys?

Participant: Yes, the drawings show the intricate details of the temple's architecture. It conveys a sense of dazzle and speculate. It reminded me of my visit to Wat Phumin when I was in primary school in Nan province, where I studied at Strisrinan School. Visiting important architectural buildings in Nan was a requirement at my school.

Researcher: Can you tell us about the memories these drawings brought back for you?

Participant: Yes, seeing these drawings brought back memories of the time I spent in Phumin-Ta Li community. The community is known for its rich cultural heritage, and visiting Wat Phumin was a highlight of my trip. The drawings captured the essence of the temple and the community beautifully as I remember it.

Researcher: Can you tell us more about the community?

Participant: Evidently, Phumin-Ta Li community is located in the city of Nan, an important area with a lot of government buildings and a thriving business community. It is known for its traditional way of life and cultural practices. Additionally, the community is steeped in history and has been actively preserving its cultural heritage for many years, particularly in relation to Wat Phumin. Therefore, Wat Phumin is an important place to Phumin-Ta Li community, which is an important landmark and a testament to the community's cultural significance.



Figure 4: Solos Punakabutra gave a lecture at College of Communication Arts Suan Sunandha Rajabhat University Nakhon Pathom Campus

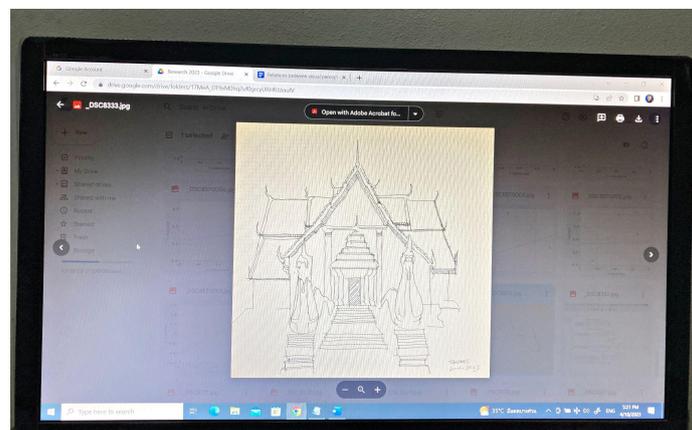


Figure 5: A drawing of Wat Phumin on the participant's computer screen

Finding and Discussion

Based on the research conducted on the relationship between visual perception and working memory through urban sketches in the Phumin-Ta Li community of Nan province, the researcher found that urban sketching can have a positive influence on both visual perception and working memory, as revealed through picture interview methodology. The study used images of urban sketching, particularly those of Wat Phumin, to pose questions to the participants and gather data on their visual perception and working memory. Therefore, the researcher used a model of working memory adopted from Daniel Willingham (2009) as figure 6 to describe this event which are drawing of Wat Phumin represent Environment, and the visual perception represents Long-term memory As a result, In this particular model, the working memory is being used to hold and manipulate a mental image of Wat Phumin, which represents the environment being perceived. The visual perception of the environment is stored in long-term memory, which is a more permanent storage system for our memories. The study found that urban sketching (drawings of Wat Phumin) helped the participant to better understand the visual elements of the environment, such as the shape, texture, and colors of buildings, trees, and other objects. This improved their visual perception and helped them to better retain visual information in their working memory. As a matter of fact, the study found that urban sketching helped participants to retain more information in their working memory, as they were required to remember and draw various details of the urban environment. This exercise helped them to improve their working memory and their ability to manipulate visual information in their minds. Overall, the findings of the study suggest that urban sketching can be a useful tool for improving both visual perception and working memory. The use of images of urban sketching, particularly those of Wat Phumin, was an effective way to gather data on the effects of this practice. The study highlights the potential benefits of incorporating urban sketching into educational in different areas.

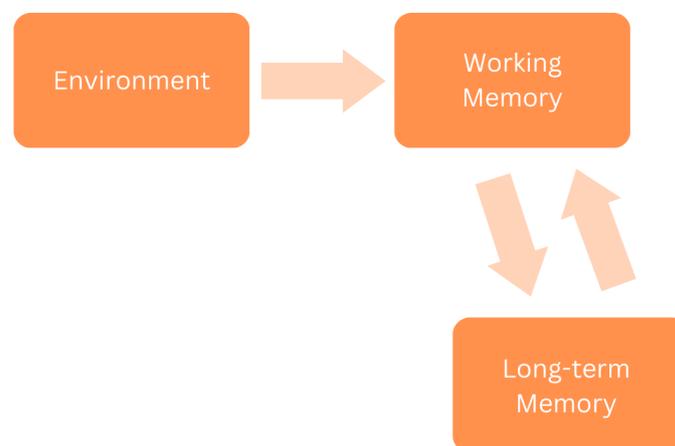


Figure 6: *Model of Working Memory adopted from Daniel Willingham (2009)*

Conclusion

Based on the study conducted on the relations between visual perception and working memory through urban sketches at the Phumin-Ta Li community, Nan Province, it can be concluded that there is a significant relationship between visual perception and working memory. The results indicate that individuals with higher working memory capacity are more likely to have better visual perception skills, which allow them to retain and recall details of urban sketches more accurately. Moreover, the study highlights the importance of the environment in which an individual is placed. The participants who were familiar with the

community had better visual perception skills and were able to recall details with greater accuracy, indicating the influence of familiarity and context on visual perception and working memory. Overall, this study contributes to the understanding of the relationship between visual perception and working memory and the importance of the environment in shaping these cognitive processes. Further research in this area can help in designing effective interventions to enhance cognitive abilities and improve visual perception and working memory.

References

- Baddeley, A. (2012). Working Memory: Theories, Models, and Controversies. *Annual Review of Psychology*, 63(1), 1–29. <https://doi.org/10.1146/annurev-psych-120710-100422>
- Bolliger, J., Götzfried, M. A., & Röcke, C. (2020). *Spatial cognition predicts the quality of autobiographical memories*. *Scientific reports*, 10(1), 1-9.
- Braun, V., & Clarke, V. (2006). Using Thematic Analysis in Psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Goldstein, E. B. (2019). *Sensation and Perception. Cengage Learning*.
- Kozbelt, A., & Seidel, A. (2006). Expertise in Complex Performance Domains: Elite Performance in Visual Arts and Chess. *Journal Intelligence*.
- Lewicka, M. (2011). Place attachment: How far have we come in the last 40 years?. *Journal of Environmental Psychology*, 31(3), 207-230.
- Luck, S. J., & Vogel, E. K. (2013). Visual working memory capacity: From Psychophysics and neurobiology to individual differences. *Trends in Cognitive Sciences*, 17(8), 391–400. <https://doi.org/10.1016/j.tics.2013.06.006>
- Palmer, S. E. (1999). *Vision Science: Photons to Phenomenology. Bradford Books*.

Contact email: tawipas.pi@ssru.ac.th