Analysis of the Application of Color Psychology Practices for Teaching Mandarin Pridi Banomyong International College, Thammasat University

การใช้จิตวิทยาเรื่องสีในการสอนภาษาจีน วิทยาลัยนานาชาติปรีดี พนมยงค์ มหาวิทยาลัยธรรมศาสตร์

Wang Chunyu[*]

Abstract

The purpose of this study was to study the effects of color psychology on memory especially the application of colors to Mandarin teaching as a second language (CSL/CFL). This paper examined the psychological effects of colors on learning ability and memory and analyzed the role of warmth and coolness in facilitating teaching so that teachers of Mandarin could choose right colors to improve learners' attention and enhance their learning ability and memory. Through the study of color psychology, PPT slides were designed to have red, yellow, green and blue backgrounds and applied in oral teaching activities. The results were analyzed using t-test of the EG and CG to discover significant difference among four tasks designed to assess learning and memory retention. The results showed that the application of color psychology was an appropriate theoretical method that could support educational activities, especially in stimulating students' attention and could help students with short-term memory. In conclusion, it was an effective tool that could improve the effectiveness of Mandarin teaching.

Keywords: Chinese as a Foreign Language, Color Psychology, Attention, Memory

บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาอิทธิพลทางจิตวิทยาของสีที่ส่งผลต่อการจดจำ โดยเฉพาะอย่างยิ่งการประยุกต์ใช้สีเพื่อการเรียนการสอนภาษาจีนเป็นภาษาที่สอง (CSL/CFL) งานวิจัยนี้ตรวจสอบผลกระทบทางจิตวิทยาของสีในด้านการเรียนรู้ การสังเกต การจดจำ เพื่อวิเคราะห์บทบาทของความอบอุ่นและความเย็นของสีในสื่อการเรียนการสอน โดยเลือกใช้สีที่เหมาะสมเพื่อเสริมสร้างความสนใจในการที่มุ่งเน้นการเรียนรู้และความทรงจำ บทความนี้ได้ศึกษาการทดลองด้านจิตวิทยาสีโดยออกแบบสไลด์ (PPT) ที่มีพื้นหลังเป็นสีแดง

[*] Lecturer in Pridi Banomyong International College, Thammasat University

สีเหลือง สีเขียว และสีน้ำเงิน (PPT) เป็นการประยุกต์ใช้โปรแกรมคอมพิวเตอร์ในการสอนเชิงปฏิบัติในกิจกรรมการสอนระดับมหาวิทยาลัย ต่อจากนั้น วิเคราะห์ผลลัพธ์โดยใช้ t-test สำหรับ EG and CG สำหรับงานทั้งสี่ที่ออกแบบมาเพื่อประเมินการเรียนรู้และการเก็บรักษาความทรงจำ ผลการศึกษาแสดงให้เห็นว่า อิทธิพลของจิตวิทยาสีเป็นวิธีการทางทฤษฎีที่มีคุณค่าอย่างหนึ่งที่สนับสนุนกิจกรรมการศึกษา โดยเฉพาะอย่างยิ่ง ในการกระตุ้นและเพิ่มความสนใจของนักเรียน นักศึกษาซึ่งเป็นสิ่งสำคัญสำหรับการจดจำระยะสั้นและสามารถนำมาประยุกต์ใช้ในการเรียนการสอนอย่างมีประสิทธิภาพมากขึ้น

คำสำคัญ: ภาษาจีนเป็นภาษาต่างประเทศ, จิตวิทยาสี, ความสนใจ, การจดจำ

Introduction

One of the biggest concerns of most teachers is the ability to maintain students' concentration during class. In order to help students gaining the needed skills, teachers have also researched different practical methods for teaching Mandarin as a foreign language; for example, games and Chinese songs, as effective teaching methods in the classroom. The principles of color psychology have been used widely to impact teaching strategies. Nowdays, teachers can access high-tech teaching software, modern multimedia courseware (PPT) (Smith, 2016), smartboards, whiteboards and markers all of which have been widely used in the modern classroom. Scientific studies have shown that people obtain 80% of their information from visual sources while only 20% comes from all other sources (Hilbert & Lopez, 2011). For this reason, it is important that we have courseware that embodies the principles of color psychology as it pertains to effective learning.

This study explored the use of color psychology in courseware and how it can improve visual aesthetics and enhance student's attention for an overall stronger visual effect. The choice of color in the designed courseware should be based on educational psychology principals to increase motivation and create a better learning environment. To this end, we examined and observed the effects of color physiology that promoted student's constructive attitudes in learning Mandarin during activities for a semester. Color psychology can have a significant impact on a student's perception and higher psychological activities.

As early as the 1900's M. Luscher, provided an in-depth analysis of his work on color psychology. He researched and determined the effect of color in his studies of cognition and perception psychology (Picco & Dzindolet, 1994). In daily life, people are affected by the psychological impact of color at work or in a learning environment that are virtually

imperceptible for most people, even during higher perception and mental activities (Kurt & Osueke, 2014). Despite the criticality of this, it is no simple matter to incorporate the principles of color psychology in the design of courseware. It is therefore crucial that the effectiveness of visual materials is maximized to ensure maximum knowledge capture and retention. People may have a subjective psychological response to the visual stimuli in their environment resulting in an objective response. This, in turn, affects people's perception, memory and thought processes. As has been discussed by psychologists, this is due to the colors contained in the visual stimuli (Elliot, 2015). The valuable application of these principles in courseware design should therefore be driven by core learning rather than on the personal subjective feelings of the teacher for the teaching environment. To stimulate students' attention in learning, the teacher must be aware of the effect of color on students' learning and be flexible and adaptable. These principles can therefore be employed to enhance students' psychological abilities, understanding, attention and memory to create a more effective teaching and learning environment.

Review of literature

1. Implementation of teaching methods for Mandarin

The number of foreigners who have learned Mandarin in mainland China has shown an upward trend year after year. Teachers have created systemic and theoretical teaching methods to increase learners' attention and enrich the classroom teaching atmosphere. These methods include songs, games and practical Chinese training series (实用汉语教师培训教材系列) which have been utilized to improve the teaching quality (Gong, Lyu & Gao, 2018). Songs have been widely used for teaching and learning Chinese as a second language or foreign language (CSL/CFL) however, in these studies, the songs are a supplemental teaching method. Games are also another method applied commonly in the classroom (Sara et al., 2018) as one of the most useful methodologies to learn Chinese characters (Dicky et al., 2017). Using data from the period between 2009 and 2018 (see fugure1 below) from CNKI https://kns.cnki.net/kns/Visualization/VisualCenter.aspx we created a graph showing the number of research papers by research focus in China. Although both methods may seem at this point to be a great way to increase attention in the classroom much research about both methods focused on how they are to be used, while few of them focused on effective memory retention for short-term memory of what students had learned in the classroom.

For this reason, it is necessary to do research on different teaching methods and to go through the teaching process in the classroom. Given teaching as a focus on instructional context, the use of a method-appropriate strategy associated ith color psychology which engages a student's attention, and is perceivable even subconsciously and facilitates learning (Lloyd-Jones, 2009). Thus, in the context of color effects, based on using color as a background, effects on the memory area of the brain were evidenced (Lucic & Talarczyk, 2019) as well as the affects of color on our working and studying. (Wyllie & Batley, 2019). It would seem to be a relevant teaching strategy for a (CSL/CFL) classroom. For this reason we incorporated red, yellow, green, and blue (EG) versus the black and white (CG) in our teaching (Rello & Bigham, 2017) and some researchers refer to color as Seen-Psychology (Pett & Wilson, 1996; Elliot & Maier, 2013). We researched and utilized color psychology in our (CSL/CFL) teaching and learning area.

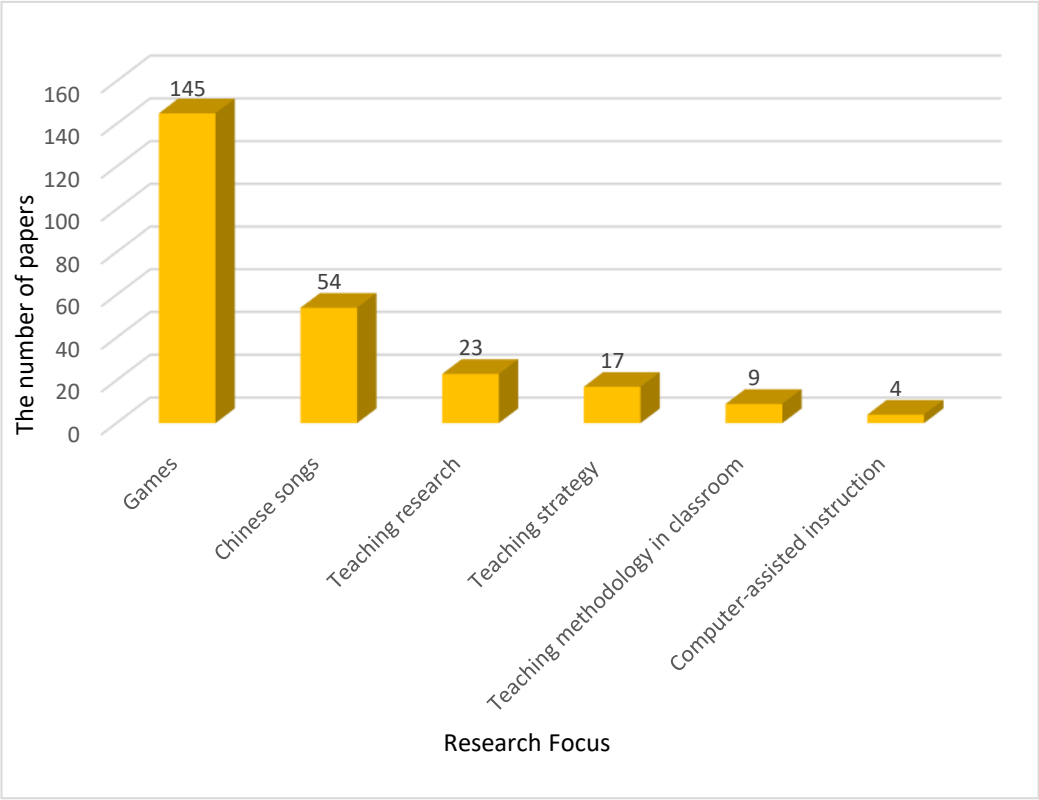


Figure 1 The number of published papers about teaching in China between 2009 and 2018 from CNKI

2. The physical point of view

When learning a foreign language, focused attention and improved memory are crucial. With regard to teaching. We have found color physiology applied to teaching (CSL/CFL) and learning to be useful. Normally color activities for young children made learning fun and engaging (Duyan & Unver, 2016) Physiologists have done many studies related to colors. Early studies by Eric Jensen (2008) showed we register 36,000 visual messages each hour through our eyes and 80 to 90 percent of all information is acquired by our brain visually. As well 40 percent of all nerves from the retina link to the brain which gives attention to ranking tones of color, lightness, darkness, motion, form and depth. After the visual organs are stimulated by colors, a color image is formed in the brain (Zeki, Semir & Lamb, 1994). The cerebral cortex has different responses from the analysis of external stimuli. Psychologists have tested and verified different colors that create psychological reactions related to color (Dzulkifli & Mustafar, 2013).

3. Review of psychological effects of colors

After the visual organs are stimulated by colors, a color image is formed in the brain. The cerebral cortex has different responses to the analysis of external stimuli. Psychologists have tested and verified different colors that create psychological reactions related to color (Moschos, 2014). Psychologists set a testing time for how long subjects were in rooms of different colors (Takimoto & Huzisawa, 1989). The subjects gave full accounts of the reactions caused by certain colors. According to the cool and warm hues of colors as the research background, psychologists studied physiological feelings and changes of attention (Valdez & Mehrabian, 1994). It is well known that the color of seats in fast food restaurants stimulates appetite. Neutral hues at a coffee shop made people feel relaxed even though they seemed unaware of the color-effect (Kawasaki & Yamaguchi, 2012). Based on this, more researchers organically combine color psychology with educational psychology, facilitating creative thinking in the classroom. Existing research has focused mainly on young students. The stimulating environment produced an attentionnal change which can change a person's specific attention and psychological mechanism for cognitive processing (Stevenson, Schilhab & Bentsen, 2018). However, little research has considered the influence of colors on our teaching in CSL/CFL contexts.

4. Influence of color

Colors are divided into cool hues and warm hues, however green/blue and red/yellow were selected by researchers as the basis of the study for color tests (Patricia, et al., 1995). Visual fatigue is inseparable from the warm color that people are perceiving (Sagawa, 2002). The different hues produce a difference in the hormones from the optic nerve to the brain, resulting in different effects. The correct application of different hues can eliminate visual and physical fatigue and influence the mood of a student (Steptoe & Cox, 1988). The warm color hues are more likely to arouse attentional excitement than cool color hues but warm color hues produce positive feelings and occupy a dominant position in cognition. The cool color hues that are the opposite also have a positive reaction. In 1925 surgeons in the USA were stimulated for a long time during surgical procedures from blood (Jessica et al., 2016) that is red which caused vision fatigue and after-image (figure2) Morton (1995) also analysised the data concerning after-image in an article named Color Matters on the website https://www.colormatters.com/. To reduce the fatigue of warm color stimulation from red, green has become a stable and safe color in operating rooms around world. It is also widely used in teaching activities as a way to protect the eyes from fatigue (Xu, 2015).

Figure 2 An example testing

5. Rationale and research on attention for warm colors

Guilford and Smith (1959) did research and found that bright color create greater pleasure, and warm colors such as red arouse our attention (Madden, Hewett & Roth, 2000) and generate more attention than black and white (Schaie & Heiss, 1964) However red as a typical warm color is more attractive to one's attention (Kuniecki, Pilarczyk & Wichary, 2015). Before people consciously pay attention to something, their attention is captured in the subconscious (Fortier-Gauthier, Dell'Acqua & Jolicoer, 2013) and they are aroused (Jacobs & Suess, 1975).

A statistical analysis of hue and saturation also shows that the chromaticity distribution of significant features and non-important features is significantly different from warm colors which leads to better visual attention models (Krahn, 2018). Warm colors generate a stimulated awareness in people and is widely used in various fields . Table 1 lists studies related to the effect of color and their findings from those (Kristi, Gaines & Curry, 2011)

Table 1 Research Related to Warm Colors and Attention

Title	Author	Findings
Neural mechanisms of selective visual attention. Vol. 18:193-222 Volume publication date March (1995)	R. Desimone & J. Duncan	- Visual sitimuli is the primary medium to draw attention
The real effect of warm-cool colors WUCSE-2006-17 (2006). *All Computer Science and Engineering Research.*	Bailey, R.J., Grimm, C. & Davoli, C.	- Warm colors create a higher degree of attention than cool colors - Warm colors increase depth perception
The Interactive Effects of Colors On Visual Attention and Working Memory *International CHRIE Conference-Refereed Track*. (2010).1	Kim, D.	- The effect of color on people's visual attention and the correlation between attention and maintaining working memory.
The Effects of Color on Learning and Behavior Journal of Family & Consumer Sciences Education 29 (1), Spring/Summer (2011)	Gaines, K. & Curry, Z	- Color has the ability to positively impact student attention.
How do warm colors affect visual attention ACM International Conference Proceeding Series (2012)	Pal, Rajarshi & Mukherjee, Jayanta & Mitra, Pabitra	- Warm colors draw attention or are more likely to guide attention.

6. Colors stimulating attention to affect short-term memory

A key question for classroom learning from the research into the impact of attention promoting effects on memory is whether warm or cool colors can impact learning and memory retention (Allen, 1990; Haynes, 2017). Visual stimuli are encoded in the brain as information. Another factor related to memory is conneted to affective factors and cognitive awareness factors sent to the brain's hippocampus circuit which is the important area in a human's brain for memory. In previous studies Japanese scholar Harada (2009) identified that humans can misrecall the color from memory after seeing it and people are not good at recalling colors. Color can affect attention levels and cause emotional arousal, which can

help control the process and subsequently improve memory (Vernon & Lloyd-Jones, 2003). In the context of attentional activation whether color has a positive effect on memory (Levine & Pizarro, 2004) also proved attention made memory better, however, the majority of the research concerned (Mahsan, 2014 & Chu, 2018) teaching childern more than other areas of teaching with color (Park, 2014). Color sychology plays a singnificant role for information to be accurately stored in the brain. It will improve a wide range of teaching ideas for CSL/CFL.

7. Rationale and research on short-term memory for cool colors

Mariam and Intan (2012) did research on the potential of color to effect and develop memory (Ledoux, 1994) researched improved memory later and studied cool color as an active medium to affect information retention. Based on the characteristics of cool colors, low wavelength colors promote restfulness and calm, and they improve efficiency and attention (Miller, 1997) Greene, Bell and Boyer (1983) also studied the use of color with cool colors on short memories . Blue and green are the most obvious of the cool colors (Serra 2011) and they keep people calm and peaceful which is also a way of stimulating thinking to promote short-term memory (Clark & Fiske, 1982). On the other hand, cool colors can increase the duration of a person's attention resulting in more information being aquired and be easier to remember in a short period of time. Table 2 lists studies related to the short-memory effect of color and their findings from those studies. In this study, we will analyse the effect of color on attention and memory as compared to the more prevelant black and white teaching materials in an attempt to replicate the result (as cited in Kristi, Gaines & Curry).

Table 2 Research Related to Cool Color and Attention

Title	Author	Findings
The influences of emotion on learning an task d memory Published online 2017 Aug 24.	Tyng, C. M., Amin, H. U., Saad, M.N. M. & Malik, A. S.	- Cool colors have a calming effect resulting in a longer duration of attention -Increased short-term memory
Arousal and Cognition: Memory for Color *Versus* Black And White Multimedia Presentation, The Journal of Psychology, 94:1,147-150, Grant (1976)	Frank H. Farley & Alfred P.	- Compared to black and white colored multimedia is more likely to improve short-term memory
Blue or Red? Exploring the Effect of Color on Cognitive Task Performances. Science (New York, N.Y.). 323. (2009). science.1169144.	Mehta, Ravi & Zhu, Rui Juliet.	- Blue or green leads to better performance than red. - Blue enhances performance on a creative task.
Emotion, memory, and attention in the taboo Stroop paradigm Volume: 16 issue: 1, page(s): 25-32 Issue published: January (2005)	MacKay, D. G. & Ahmetzanov, M. V	- Enhaced overall attention and individual memory for colors
Short Term Memory and Color Volume 30 (2018) Headwaters	Juan J. Perez	- Be able to remember better than if only black & white - There is influence on an individual's memory when there was color involved.

Research Questions

As noted above the purpose of this study is to provide more positive teaching methods for a CSL/CFL classroom. The findings of this study will help instructors to keep students attention in CSL/CFL and maintain a postive atittude to create a improved memory. This study addresses the following research questions:

1. Do warm colors, represented by red and yellow as a focus, effectively encourage student learning in CSL/CFL activities and attention in the classroom?

2. Do cool colors, represented by blue and green as a focus, generate positive attention to increase short-term memory in the classroom?

Method

1. context of study and participants

This study was applied in two random co-ed classes as the experimental group and control group that had 30 students in each classroom accoring to the college arrangement and baseed on the available CSL/CFL classes at that time http://www.pbic.tu.ac.th/main/ These students were age 19-21 years-old who were all Thai and from the same major at a university in Thailand. Gender was not considered as part of this study since class composition were an enrollment decided by the university. These were compulsory courses that were taken entitled *Intermediate Mandarin Conversation*.The duration of the research wasw 15 weeks consisting of 2 hours per week . The Mandarin proficiency of all students was HSK Level 3-4 in the 2017 academic year.The teaching aim was to master the basic oral communication, words and phrases and attain HSK Level 5.

2. Study design and data collection

The study followed the mark allocation in our teaching syllabus including post-lecture dictation quizzes, role playing, the Mid-term and Final-tests and an anonymous student course evaluation. Oral evaluation was done for the two groups (EG&CG) with authentic assessments (Wiggins, 2011) for examining students' realistic situation skills and abilities, performance assessments (Airasian, 2005) for measuring learning effectiveness. Realistic role-playing was used to demonstrate achievement of the teaching objectives as well as students' knowledge of the course material. (Green et al., 2007) These methods were chosen because they allowed for frequent assessment of the students and feedback to the students (Weinstein, Romano & Mignano, 2011). All of the teaching processes for both classes contained identical teaching content and was designed using PPT (PowerPoint) by the same instructor who assesed and analyzed the differences between the two classes.

Thus, the teaching methods can be applied through the pictures to teach vocabularies on the PPT (Inoue-Smith & wang, 2016), and students are totally immersed in Mandarin. The whole the process is in accordance with learning attention and ability (Emmer & Everson, 2013). The experimental group was provided visual teaching material incorporating red/yellow and blue/green as the color focus to enhance their attention and potential shortmemory retention. The control group was provided black and white visual teaching material on PPT in contrast to the experimental group. Figure 3 depicts the study structure diagram which outlines the course structure in which the data was collected for both groups.

Study structure Diagram

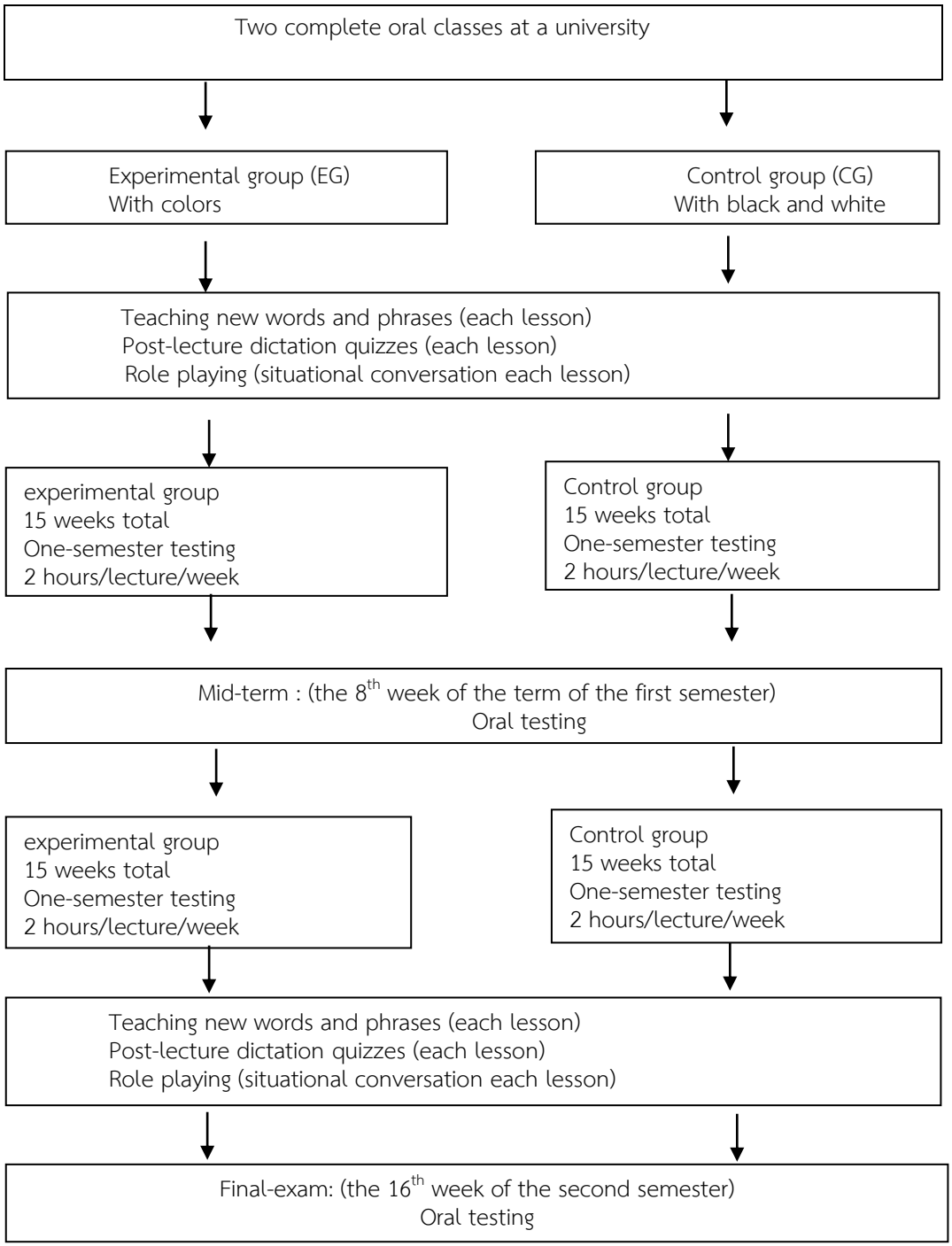


Figure 3 Study structure diagram

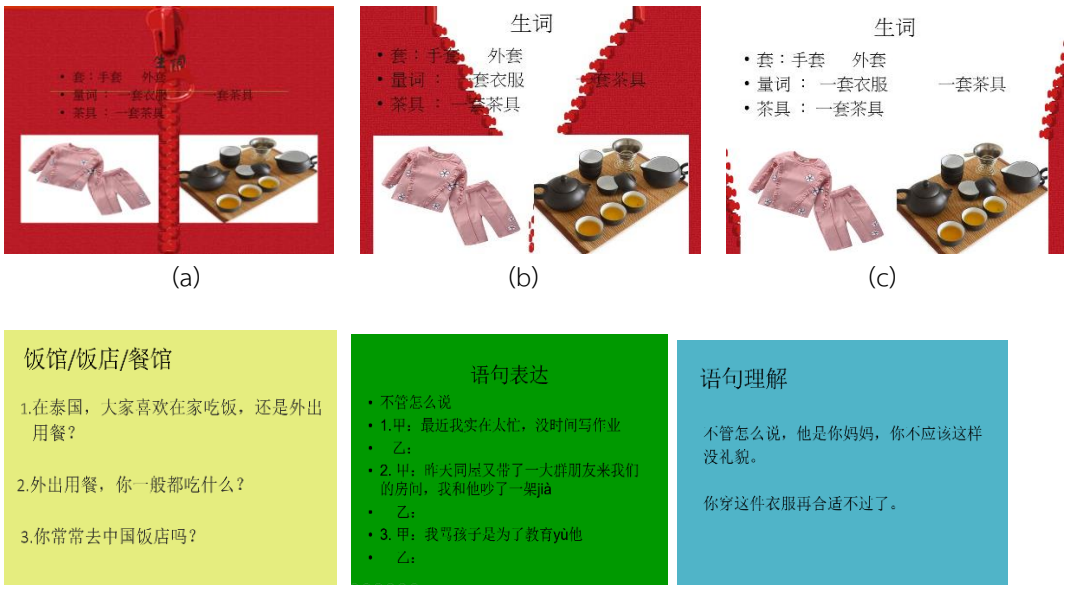
3. Teaching procedure

In this study, the teaching objective was to provide an effective teaching result and to accumulate a large number of vocabularies to obtain HSK L5 as defined by the official Chinese standards which can be viewed here: www.chinesetest.cn/index.do. In each of our classes, all of the students learned 10-15 new words and phrases per class totally in an immersive and motivating environment. In the study, due to the negative impact of after-image as illustrated in Figure 4, there was a limit of 10 seconds to show the transparent red slides containing the Mandarin vocabulary on PPT. The yellow slides did not include a time limit due to the lack of after-image effects. Blue and green were used as the background for the slides of Chinese expression and sentence structure (Anuardi, Shinohara & Yamazaki 2016). The sample slides of the PPT used in our teaching in Figure 4 (from a to c) shows the progression of the zipper opening after the 10 second limit. The ordering of the red and yellow slides was based solely on the content of each slide rather than following any specific pattern or sequence.

(a) Visual stimulus

(b) After-image

Figure 4 The negative impact of after-image as illustrated in the figure 4 (b).



(a) (b) (c)

(d) (e) (f)

Figure 5 From (a) to (c), shows the progression of the zipper opening after the 10 second limit, from (d) to (f) shows the yellow, green and blue slides as background on the PPT in our teaching.

After treatment (i.e., teaching new words and phases), each group received two assessments, including situational role-playing and dictation. The performances are divided into four or six people in each group as chosen by the students. For example, in the first unit, when they met for the first time, they played international students in different countries and introduced themselves with the vocabularies and phrases they learned and they practiced cultural exchanges. During the treatment, the results of performance activities were recorded.

4. Testing and Scoring Procedures

For this study, the testing is shown in Appendix 1 for mid-term and final-exams (Zhang & Lin, 2017; Koh, et al., 2018). The scoring allocation of each evaluation method is outlined in Table 3. The mark for the test group was obtained and analyzed to determine if red and yellow were effective in increasing attention in a short time. For the dictation and role playing, the same scores were analyzed to determine if blue and green were effective in enhancing short-term memory.

For the dictation quizzes, one mark was awarded for each correct word. Students received the average score of their quizzes as their final quiz score. Roleplaying was performed freely for 10 minutes. The group would be deducted one mark for each error in the following categories: grammar (5 marks) / a whole expression (5marks) / pronunciation (5marks) / tone (5marks), resulting in a group score out of 20. The scoring scale for the Mid-term and final-exam is provided in Table 4 (Cai, 2010 & HSK). We asked students to blindly choose either paper A or paper B, each of which contained different questions. This was a measure that was implemented to ensure fairness and to avoid revealing the test to the remaining students (Mabry, 1999). Two students in each group took turns asking and answering questions. This method was therefore utilized to maximize testing time and no explanations were given before answering the questions. The reliability, validity and universality of the test scoring criteria measured a wider learning experience for the participants (Herman & Winters, 1994).

Table 3 Mark Allocation for Both Classes

Tests	Description	Time limit
(Task 1) Dictation quizzes	Chose10 new words	10 Minutes
(Task 2) Role playing	Scene performance	10 minutes/group
(Task 3) Mid-term	6 minutes/2 students/group	2 hours*
(Task 4) Final-exam	10 minutes/2 students/group	3 hours*

Note * Time limit set by the college

Table 4 Mid-term and final-exam special scoring is as follows

Reading Dialogue		(1 minute/Mid & 2 minutes/Final)
Pronunciation (4 marks)	Tone (4 marks)	Intonation (4 marks)
Literacy level (6 marks)	Time (2 marks)	In total:
Answering question		(1 minute/Mid & 2 minutes/Final)
Listen to questions for accuracy (5 marks)	Grammar (4 marks)	Pronunciation (4 marks)
The accuracy of the answers (5 marks)	Time (2 marks)	In total:
Situational Conversation		(2 minutes/Mid & 3 minutes/Final)
Exact expression (14 marks)	Complete answers (8 marks)	Grammar (3 marks)
Pronunciation (3 marks)	Time (2 marks)	In total:
Tell a story		(2 minute/Mid & 3 minutes/Final)
Express complete ideas (14 marks)	Grammar (3 marks)	Fluency (3 marks)
Express clear ideas (8 marks)	Time (2 marks)	In total:

Results

From this study we found that using red or yellow as a background color had a statistically significant impact on short-term memory retention (Task 1 and 2). We also found that when using green or blue as the background there was no significant difference between the EG and CG on long term memory retention (Task 3 and 4).

Different oral tasks for each group in Table 3 below shows the statistical results of the detail for student's oral performance for both groups. The results indicate that after the treatment the EG group using red or yellow as the background had improved short term memory retention. The EG group using blue or green as the background had no improvement in long term memory retention compared to the CG

Table 5 Descriptive statistics for the result of each task in both groups

Test	Variables	N	Mean	Standard Deviation
Task 1 (EG)	Overall oral results	30	9.27	1.20
(CG)	Overall oral results	30	8.47	1.73
Task 2 (EG)	Overall oral results	30	16.40	1.03
(CG)	Overall oral results	30	14.60	2.69
Task 3 (EG)	Overall oral results	30	81.73	7.43
(CG)	Overall oral results	30	79.80	8.69
Task 4 (EG)	Overall oral results	30	85.80	4.85
(CG)	Overall oral results	30	84.53	6.17

To further analyze the application of the treatment, an Independent samples t-test was done for both groups by background color. This was created using SPSS 22.0 to obtain the analytical result. An Independent samples t-test of the oral tests for both groups found there was a significant difference for Task 1 at P<0.05 and Task 2 at P<0.001. The results are shown in Table 5.1 & 5.2.

Table 5.1 Independent samples t-test for both groups for Task 1 (Dictation)

Group	Background color	Mean	t	Degrees of freedom	Sig (two-tailed)
Task 1					
EG	red & yellow	0.800	2.075	58	.042
CG	black & white	0.800	2.075	51.58	.043

P<0.05

Table 5.2 Independent samples t-test for groups for Task 2 (Role playing)

Group	Background color	Mean	t	Degrees of freedom	Sig (two-tailed)
Task 2					
EG	red & yellow	1.800	3.41	58	.001
CG	black & white	1.800	3.41	37.38	.002

P<0.001

The table below shows the results of the student's examination for both groups for the green & blue background versus the black & white background. The results indicate no statistically significant difference between the groups for Task 3 at P>0.05 and for Task 4 at P>0.05. The results are shown in Table 5.3 & 5.4.

Table 5.3 Independent Samples t-test for both groups for Task 3 (Mid-term)

Group	Background color	Mean	t	Degrees of freedom	Sig (two-tailed)
Task 3					
EG	green & blue	1.933	0.92	58	.358
CG	black & white	1.933	0.92	56.63	.358

P>0.05

Table 5.4 Independent Samples t-test for both groups for Task 4 (Final-exam)

Group	Background color	Mean	t	Degrees of freedom	Sig (two-tailed)
Task 3					
EG	green & blue	1.266	0.88	58	.380
CG	black & white	1.266	0.88	54.95	.381

P>0.05

The results suggest that the application of color psychology in teaching (CSL/CFL) has a positive influence specifically to enhance short term memory retention based on color choice and can be used to augment teaching methodologies.

Discussions

In this paper, we showed that the research questions about red and yellow as a focus effectivly encouraged student learning in CSL/CFL activities and attention in the classroom. While blue and green generated positive attention and improved short-term memories for teaching (CSL/CFL). Therefore, we analysed the data from the class activities by the Independent Samples between EG and CG in a semester of teaching as shown in Figure 3.

1. The warm color hues effects

In this study, the result showed that color affected students attention, enhanced oral communication skills, expression and learning motivation (Task 1 *P*<.05 and Task 2 *P*<.01) .Color physicholgy could be used in cognition for advanced psychological activities to improve a learner's attention. This result was also consistent with previous research (Andrew & Markus, 2014). Warm color hues kept the mind active and excited in the field of teaching (CSL/CFL), students obtained oral skills and showed a statistcally significant improvement as shown by the Independent Samples Test. The significant achievement confirmed the effects of color to lower physical fatigue and to stimulate and improve the learning enviorment (Shabiralyani et al., 2015) It also introduced the impact of visual aids to enhace a learning method and reported similar findings to create a slideshow using red and yellow in the classroom. That is, students in the EG group compeleted their course of study in a cheerful state of mind.

2. The cool color hues effects

Both blue and green could keep a calm mind and be thought –conducive as shown by the results of this study that compared EG and CG, which showed that there was no significant difference (Task 3 *P*>0.05 Task 4 *P*>0.05). The effect of cool color hues and nornal traditional black and white teaching could eccourage high and active student attention. However, cool color hues are suitable for courses with strong analytical tasks. Muhammad (2018) found that black and white can create lasting and stable memory. When examining the results of this study we find that they are in agreement with the Muhammad's findings. The results of our study suggested that traditional black and white teaching methods had effects on short-term memory. The current study also didn't rule out the effect of stress during exams on the students' scores to such an extent as to have no statistically significant difference between EG and CG group results.

In particular, we found that students role playing was an acivity that generated more positive and active attitudes. Although there was the same noticeable improvement in short-term memory between the EG and CG. More pratical activities, could enable sutdents to enter roles and promote the creation of long-term memory for students. Similarly a study by Michael and Vee (2007) identified that a students motivaton to learn was a key factor to move from short to long term memory in teaching (CSL/CFL). This study was designed to

determine the effect of teaching for instructors and a sense of freedom during learning for students in the classroom.

Conclusion

This study provides a more detailed investigation regarding the effects of teaching Intermediate Mandarin Conversation (CSL/CFL) using color psychology to increase attention in learning. The study covered the entire semester of teaching speaking skills and accumulation of vocabularies. Color psychology was applied in teaching (CSL/CFL) as an auxiliary method. There were some limitations of the study which might have been inevitable. There was a noticable statistical difference for Task 2 which might have been personal preference for color among young people who generally like bright colors. Therefore, the study on motivation for the EG is much greater than the CG. As a study on the effects of color on memory by Huchendorf & Cary (2007) proved the brightness of the hue palyed a leading role in retaining long-term memory, whereas, the specific color might not increase long-term memory. Due to the study being conducted within the limits of a semester, we haven't taken brightnees into account. By the end of the examination, learning motivation and attention were important for students to learn in the classroom, the effect of color psychology was not unique and there might be many other attentioning and effective teaching methods that are beneficial for students. The research study was done with enough thoroughness to ensure the project process and objective evaluation under objective conditions.

In a future study, we might develop other courses to incorporate color psychology not only in a conversation course, but also paying attention to study relative memory on large numbers of vocaularies in our teaching activities. It would be another basic task for teaching (CSL/CFL) while gaining attention. Combining traditional balck and white teaching backgrounds with modern ideas might benefit students more in future teaching activities for Chinese as a foreign language.

参考文献

Mid-Term:
Paper A
朗读对话： Reading conversation
售货员：请问你想买什么？
顾客：我想买又皮鞋。
售货员：你看中哪种了？
顾客：那种样式的怎么样？
售货员：这种鞋,最近卖得不错，你穿多大号的？
顾客：我也不知道。你看我穿多大的合适？
售货员：你穿这双试试。
顾客：这双有点儿小，有大一点儿的吗？
售货员：对不起，这是最大的了。
回答问题：Answer the Question
学生甲：介绍一下在泰国到哪儿买东西好，都有什么商品?
学生乙：介绍一家你常去的饭馆，在那儿你最喜欢吃的菜是什么？
情景对话：Situational Conversation
1.去中国朋友家做客，第一次见到他的父母，送给他们礼物时，你说什么？
2.你常到地摊上去买东西吗？为什么？
成段表达 ：Tell a story 介绍你的国家的交通情况。

Paper B
朗读对话：Reading conversation
顾客：劳驾，我跟你打听一下，我前两天在这买了个录音机，回去发现有毛病，能不能换一个？
售货员：当然可以。
顾客：如果换不同的款式可以吗？
售货：对不起，不同的款式价格不一样，是不可以的。
顾客：如果换了以后还有问题，我可退掉吗？
售货员：如果确实是质量问题，我们可以退货。
顾客：那我明天把录音机拿来。
售货员：别忘了带发票
回答问题：Answer the Question
学生甲：介绍你最好的一位朋友?
学生乙：请问，你常去哪里购物，为什么?
情景对话：Situational Conversation
1.朋友让你和他/她一起去购物，可是你不想去，你怎么说他/她才不会生气？
2.去中国朋友家做客，你打算离开时，对主人说什么？
成段表达：Tell a story 假期你有什么打算

Final Exam:
Paper A
Answer the question:
朗读对话：Reading conversation
甲：上个周末你怎么过的？
乙：我去听了场流行歌曲演唱会。
甲：是吗？唱得怎么样？
乙：咱们那儿有名的歌星差不多都来了，观众们一边听歌，一边跳舞，可事实上劲儿了！有的观众扯着嗓子吼，把我耳朵都震疼了。
甲：听你的口气，你对流行歌曲很感兴趣了。
乙：当然啦！我喜欢听，更喜欢唱。
甲：那你会唱什么歌呢？
乙：我最喜欢流行歌曲。
回答问题：Answer the Question
学生甲：如果你的同屋睡得太晚影响你休息，你怎么办？
学生乙：你认为中国人的生活习惯与泰国人的生活习惯在哪方面不同？
情景表达：Situational Expressions
学生甲：中国人怎样过春节 ？
学生乙：泰国人怎么过泼水节？
成段表达：Tell a story 我的业余爱好

Paper B
朗读对话：Reading conversation
甲：上个周末你怎么过的？
乙：我和朋友在一起唱歌了。
甲：听你的口气，你对歌曲很感兴趣呀？
乙：当然啦！我喜欢听，更喜欢唱。
甲：那我会唱什么歌呢？
乙：可多啦，中国有名的流行歌曲、民歌什么的我都会唱。
甲：我喜欢弹吉他，没事的时候我自己弹自己唱，周末的时候也常和朋友一起唱。
乙：以后有机会，我们一起唱卡拉OK吧。
回答问题 Answer the Question
学生甲： 你在生活中遇到过什么麻烦事吗？你是怎么解决的？
学生乙： 你最喜欢的节日是哪一个？为什么喜欢？
情景表达：Situational Expressions
学生甲： 在你的国家新都有哪些活动？
学生乙： 中国春节有哪些习俗与泰国的习俗相同与不同？
成段表达：Tell a story 谈谈你的生活习惯

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