

Study on the factors affecting the change of color palette in dreams

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Summary. This study mainly explored the factors affecting color changes in dreams. Through literature research, it is concluded that people see colored objects in their dreams that are related to continuous supporting memory, emotional memory, creativity (spontaneous thoughts), goals and other factors. The main target population of this study is art workers. On the variables of continuous supporting memory, emotional memory, creativity (spontaneous thoughts), objective and analysis of art graduate students. Through data analysis, the proportional distribution of the color in the dream, and the significant influence of each variable on the color change in the dream.

Keywords: A color palette in your dreams, Dream paintings, Dream influencing factors

Introduction

In chapter 7, Section 2, of The Interpretation of Dreams (Freud, 1899), it proves that dreams are a process of presenting visual images by mental organs, and that image expression is the influence of resistance against the process of thought into consciousness. It is called memory backtracking. He spoke of remolding ideal content into sensory images, focusing mainly on image elements, and attributing colors in dream images to the repetition of something in memory. In other words, (Victor Kalaf, M.D., 2015): The new color sensation restores the color of the memory image and thus shows itself in a dream. The color of a dream can be interpreted as: (1) the actual copy of old and new sensory images; (2) a symbol of old sensory impressions; and (3) the inherent resistance and regression involved in the sensory images of the dream. Based on two factors: "actual reproduction of old and new sensory images" and "intrinsic resistance and regression" (Myrzn reference). The first is partly supported by continuity — — The color in most dream reports is the observed specification of restoring waking perception (the grass is usually green and the sky is usually blue) (Schredl, 2003). Dewey de La Desma mentioned in his "Dream Survey Report" that Van Eden's dream color plate is different from others' black and white dominance, to a large extent because his dreams are flying outdoors dreams, blue sky, green field and forest. Van Eden's color plate is a friend of Nature. It is the residual shadow of the day appearing in a dream. A second memory factor for inhibiting early or recent emotional interference of life experience — or "emotional memory". Interaction between the amygdala and medial temporal memory system predicts better memory of emotional events. (Kevin Rabal, 2004) Van De Castle, assumes

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Submitted for publication: September 2022 Accepted for publication: May 2023 DOI: 10.11588/ijodr.2023.2.90727 that there is a strong correlation between a dream emotional signal and the intensity of color appearance (Van de Castle, 1994, p. 255) When awake, we respond physically to color and emotionally, to different colors (Ruscher, 1971; Birren, 1961). This is not only consistent with the highly active limbic regions in REM state dreams, but also conceptually supports the relationship of handling emotions in dreams with dream color.

Michael Schredl (2008) showed that colors in dreams are related to film reporting, creativity, personality, and memory, as creative people report colors more frequently in their dreams and in sober reports. Artists and painters are extremely sensitive to images and colors, and are full of creativity, in the usual work environment is also filled with a lot of colors. The artist's creativity is associated with spontaneous ideas. Spontaneous thoughts occur by default in the gap between directed, task-directed thoughts, or moments of perceptual review. Their content is overwhelmingly related to the thinker's current goals, directly or indirectly through associative networks, including both past and future goals.

Spontaneous thoughts are often presented again through sleep (Ernest H.W. Koster Igor Marchetti, 2018), and there is ample evidence that sleep helps consolidate long-term memory (e. g., Passecott, Germain, & Milad, 2015), especially during rapid eye movement (REM) sleep (McDevitt, Duggan, & Mednick, 2014), particularly with regard to target-related characteristics (Benneon, Payne, & Kensinger, 2015). It now appears that the period of spontaneous thinking has brought a similar consolidation benefit, though less effectively. In an extensive review of the relevant literature, Christopher, Gordon, and Smith (2011) concluded that "recent findings suggest that the offline processing that occurs during rest is related to the memory consolidation process that occurs during sleep" (p. 264). There are individual differences between internal and external processes in the control of the direction of attention. The ability to switch back and forth seems to be positively correlated with an individual's working memory ability (Rummel & Boywitt, 2014)

Spontaneous thoughts is a factor with purpose, and one's commitment to specific goals makes individuals more sensitive to cues associated with those goals. These cues will automatically prioritize for cognitive processing. These cues may be external cues in the environment, or internal cues



in one's own mental activities, and include cues related to the failure to achieve the goal (Chattard and Selingigovich, 2011). These responses may take the form of paying attention to these cues, storing them in memory, having thoughts or dream segments associated with them, or taking action. Note that it may or may not be conscious. (Klinger, 1978; Holcher et al., 1981) demonstrate the effect of goals on attention, recall, content of thought and dreams. Klinger Believe that the subject content of thoughts and dreams is directly or indirectly determined by individual goals. Goal commitment determines concentration, recall, content of thoughts and dreams, and behavioral follow-up. One's individual goals also provide an important basis for organizing one's ideas, including ideas about one's future, and the introduction of clues related to the goals appears to facilitate this process (D'Argembeau, A., and Demblon, J., 2012). According to the above literature research, people see colored objects in dreams that are related to continuous supporting memory, emotional memory, creativity (spontaneous thoughts), goals and other factors. The purpose of this study is to investigate the influencing factors of dream color disc changes of creative people with people in art work or students with relevant art learning experience.

2. Method

2.1. Design

This study adopts three main parts, the first: the literature case study of dream journal, the explanation and conclusion of researchers, the questionnaire is demographic, screening, frequency and influencing factors, and factor analysis using linear regression equation model; the collection and analysis of dream reports; and the third, the interpretation of dream paintings of art students.

2.2. Participants

A total of 120 people participated in the study, including 59 men, accounting for 49.17%, and 61 women, accounting for 50.83%. The 120 students are all art workers, mainly from art universities in Chengdu, Sichuan Province, China. Students and teachers majoring in painting, including 115 students and 5 teachers.

2.3. Materials

The measuring instruments are mainly divided into questionnaires, dream report and dream painting creation. The questionnaire is divided into demographic questions, screening questions, frequency questions and influencing factors. (such as Appendix A) 20 items; collection of dream reports and color frequency analysis; dream painting creation and interview record for art students.

Table 1. The proportion of color in dreams (N=120).

Option	Frequency	Percentage
gray	8	6.7%
black and white	4	3.3%
colourless	1	0.83%
chromatic colour	107	89.17%

Table 2. The frequency of the color appearance (N=120).

Option	Frequency	Percentage
Almost every dream is colorless	0	0.00%
Most colorless	1	0.83%
Colored and colorless frequencies are similar	0	0.00%
Most of the color	43	35.83%
Almost every dream is in color	76	63.34%

2.3.1 Instruments

The questionnaire in this study was sampled and randomly sampled through online APP, and distributed to non-art workers and art workers. A total of 120 valid questionnaires were collected. Among them, the art workers are mainly from the art universities in Chengdu, Sichuan Province, China. There are 120 students and teachers majoring in painting. Descriptive analysis was performed using the SPSS 24 version to examine the relationship between the frequency of dream color discs, and independent variables, including continuous memory, emotional memory, creativity, and goals. The questionnaire was also collected with a supplementary dream report, which can be completed voluntarily, with 87 valid dream reports. Three graduate students of oil painting major were invited to have a 15-day creation period. The three graduate students write their dream diary and draw their dreams every day. The researchers will interview the three graduate students and analyze their paintings.

3. Results

According to the frequency results, the color of the respondents' dreams is mainly composed of the following options (as shown in Table 1), the frequency of color appearance (as shown in Table 2) and the frequency of dream appearance of mood (as shown in Table 3).

Table 4 gives the results for skewness and kurtosis. Data variables are positively and negatively skewed, and the left tail of the data distribution is longer. The skewness values range from-0.468 to 0.426, which means that the data distribution is moderate and therefore acceptable. The value nearest to 0 at 0.002 represents a perfect normal distribution of the data, where the CS2 skewness value is 0.002, which measures "the color of things experienced during the day will appear in the dream. "The EM1 skewness value is 0.005. It measures that the color of a dream is related to your emotions in real life. Kurtosis values were mainly positive, ranging from-0.769 to 0.049. A normal univariate

Table 3. Emotional frequency (N=120).

Option	Frequency	Percentage
Almost every dream has no emotion Most of the dreams are without emotion	12 21	10.0% 17.5%
The two are similar in frequency Most dreams have emotions	14	11.67%
Almost all dreams have emotions	47 26	39.17% 21.66%



Table 4. Normality of Data.

		Skewness		Kurtosis		
Variable	Item	Statistic	Standard Error	Statistic	Standard Error	
	CS1	-0.052	0.109	-0.616	0.218	
Continuos autoria de 1000	CS2	0.002	0.109	-0.712	0.218	
Continuous support memory (CS)	CS3	0.025	0.109	-0.206	0.218	
	CS4	-0.122	0.109	-0.239	0.218	
	EM1	0.005	0.109	-0.317	0.218	
Emotional memory (EM)	EM2	0.280	0.109	-0.718	0.218	
	EM3	0.366	0.109	-0.046	0.218	
	CRE1	-0.096	0.109	-0.229	0.218	
Creativity (CRE)	CRE2	0.426	0.109	-0.769	0.218	
	CRE3	-0.184	0.109	0.049	0.218	
	TA1	-0.233	0.109	-0.501	0.218	
Target (TA)	TA2	-0.468	0.109	-0.469	0.218	
	TA3	-0.266	0.109	-0.632	0.218	

distribution of values between-2 and + 2, the asymmetry and intensity of the data is acceptable.

Convergent validity affirms the consistency of the relationships between the structures, regardless of the measurement method used (Jhiger, 1979). The methods used to measure convergent validity are Cronbach's Alpha reliability, factor loading, composite or construct reliability and mean variance extraction. The results are summarized in Table Table 5 (120 art college students and teachers). All structures in the table have Cronbach values greater than 0.8, thus confirming the internal consistency of the items that are reliable for the questionnaire distribution. In this study, all individual items had factor loads above 0.50 and mostly above 0.70, ranging from 0.624 to 0.933. The CR results in this study were all above the threshold. The range of composite reliability values ranged from 0.830 to 0.98. The AVEs were also greater than 0.4, ranging from 0.545 to 0.820. Accord-

ing on composite reliability, the structure with the highest internal consistency is emotional memory.

The dream colors present in the 87 effective dream reports collected in this study were black and white, red, peach, pink, yellow, tan, yellow, orange, blue-gray, sky blue, dark blue, and green. Many colorful dreams will have a more memorable single color protruding, attached to an object. Among them, the blue series, red series and yellow series accounted for the largest proportion (see Table 6).

The final focus of this study is the interpretation of dream paintings created by three graduate students from art universities in Chengdu, Sichuan Province, China. The three graduate students are called Chen Xinyu, Fan Yuxi and Ge Junbai. They will keep a 15-day dream diary record and the expression of their dream paintings. Figures 1 to Figure 4 are from Chen Xinyu's paintings, and Figure 5 to Figure 8 are from Fan Yuxi's paintings. Figures 9 and Figure 10 are

Table 5. Confirmatory Factor Analysis Result, Composite Reliability (CR) and Average Variance Extracted (AVE).

Variable	CA	Factors Loading	t-value	CR	AVE
Continuous support memory (CS)	0.823			0.830	0.552
CS1		0.784	13.22*		
CS2		0.789	13.27*		
CS3		0.763	13.03*		
CS4		0.624	-		
Emotional memory (EM)	0.946			0.948	0.820
EM1		0.889	32.36*		
EM2		0.873	30.86*		
EM3		0.933	37.18*		
Creativity (CRE)	0.867			0.867	0.568
CRE1		0.782	17.73*		
CRE2		0.685	15.31*		
CRE3		0.708	15.87*		
Target (TA)	0.856			0.856	0.545
TA1		0.741	14.66*		
TA2		0.702	13.98*		
TA3		0.792	15.52*		

 $Note: CA = Cronbach's \ Alpha, \ CR = Composite \ Reliability, \ AVE = Average \ Variance \ Extracted, \ ^*=p-value < 0.05. \ Alpha, \ CR = Composite \ Reliability, \ AVE = Average \ Variance \ Extracted, \ ^*=p-value < 0.05. \ Alpha, \ CR = Composite \ Reliability, \ AVE = Average \ Variance \ Extracted, \ ^*=p-value < 0.05. \ Alpha, \ CR = Composite \ Reliability, \ AVE = Average \ Variance \ Extracted, \ ^*=p-value < 0.05. \ Alpha, \ CR = Composite \ Reliability, \ AVE = Average \ Variance \ Extracted, \ ^*=p-value < 0.05. \ Alpha, \ CR = Composite \ Reliability, \ AVE = Average \ Variance \ Extracted, \ ^*=p-value < 0.05. \ Alpha, \ CR = Composite \ Reliability, \ AVE = Average \ Variance \ Extracted, \ ^*=p-value < 0.05. \ Alpha, \ CR = Composite \ Reliability, \ AVE = Average \ Variance \ Extracted, \ ^*=p-value < 0.05. \ Alpha, \ CR = Composite \ Average \ Variance \ Variance$



Table 6. Dream color ratio.

Option	Percentage
Blue	30%
Red	25%
Yellow	23%
Purple	2%
Black, white and gray	5%
Green	15%

from Ge Junbai's paintings. From the 10 paintings, the blue department accounts for the largest proportion. The dream pictures of Chen Xinyu and Fan Yuxi, are both very dreamy and gentle, both with the characters of a little girl appearing. Ge Junbai's dream picture is mainly dominated by yellow system and red system, and the content of the picture is relatively distorted, abstract and chaotic.

Interpretation of the paintings by No.1 dreamer Chen Xinyu:

Figure 2 to Figure 4, the overall tone style is consistent, with blue and gray as the tone. It depicts the little girl playing with a pink cat in the woods in a partial close view. Figure 1 is relatively more colorful. At this time, the little girl and the cat integrate which is the image of a cat woman. The picture is very dreamy and fairy tale. In Chen Xinyu's dream diary, she often dreams that she was walking in the forest, like looking for something, the surrounding environment is very vague, remember the things around her, also can not see what she looks like in the dream, the line of sight is always stuck on the feet. Always at night, the sky is gray, there will be a pink kitten to come close to themselves, as if looking for help. The whole dream process was a little depressing and heavy, but with the appearance of the pink kitten became surprised and happy. Finally, the cat suddenly disappeared and saw himself in the dream become the image of a cat woman.

After waking up, the painter quickly wrote down a dream diary according to the memory, and recorded the elements and colors appearing in the dream. Dreamers also answered their dreams according to the dream report template given by the researchers. In the recent life, the dreamer recently in the work and study of some confusion, greater pressure. I have a white cat, and I don't know why my dream cat is pink. Dreamers also have no special preference for pink either. But playing with my cat in the dream let me go. When the dream painting is expressed, the memory of the dream gradually drops due to the long time, and the picture can-



Figures 1 and 2.







Figures 3 and 4.

the cat is formed.

not present other specific things. However, the overall color of the dream and the protruding single color of the dream have a deep memory, largely because these protruding colors are attached to the specific image. The combined image of the dreamer and the cat is the transplant function of the dreams, which can also see the intimacy and trust between the dreamer and the cat. Wearing a white dress in the dream should be the white cat raised by the dreamer in real life, while the pink cat in the dream should be the mood that the dreamer wants to find the release, calm and pleasure feeling. Through the transplantation and modification of the dream, the image of a cat woman integrating the dream and

Interpretation of the paintings by No.2 dreamer Fan Yuxi:

Figure 5 and Figure 6 are the expressions of the same dream, with a dominant blue and black tone, and red whales and whale bones. According to the dreamer's description, she did not feel the emotional impact in the dream, dreaming of the whale and whale bones, greatly because the dreamer had seen reports about the whale fall, but why the whale in the dream was red, perhaps seeing the whale stranded beach after the blood and carrion. It is also possible that the dreamer has used a lot of red in his recent paintings, forming a visual memory of red. Blue and black tone represents the deep sea, which belongs to the image memory color.

The dream pictures in Figure 7 and Figure 8 are more dreamy. Mountains, rivers and lakes, and there are palaces on the clouds. Dreams are like flying between heaven and earth, traveling freely in them. The picture is also mainly blue and black tone, some specific images attached to the color appears, such as a yellow light on the beach, a pink cherry tree. The scene is grand, and it can be seen that the dreamer has a deep memory of his dream picture and a rich imagination.





Figures 5 and 6.







Figures 7 and 8.

The dreamer's interpretation of his dream painting is that the dreamer is an artist who likes surreal painting. He likes unrestrained picture conception and dreams to dream for inspiration. And clearly know that I was dreaming. Often dream of many magical things put together. Dreamers also love to travel very much, like to feel the beautiful scenery of nature, so they often dream of themselves on the way to travel. Do not feel the emotional effect in dreams, more like a viewer watching a movie playing. The color of the dream scene is just like that in real life, but I often dream of the night scenery, so I feel that everything around me is blue and black. Not pure black and white, clear know is blue and black. Just like all the colored objects in real life are covered with a faint blue and black surface. Then some single bright colors bulge out.

Interpretation of the paintings by No.3 dreamer Ge Junbai:

In Figure 9 and 10, the picture is more distorted, abstract and chaotic. It is mainly yellowish-brown and red. There is a gray twisted huge face, like looking down on everything. The picture is mainly color block, without too much information about specific things, you can feel the dream is more blurred. The dreamer's interpretation of his dream painting is that he is very confused in his life. Recently, he is reading many books on Buddhist scriptures, but he can not understand the meaning of the book, and the meaning of many words troubles him. Often anxious, unable to calm down. The silhouette of the water with small figures and black holes, and huge faces come from the illusion of the dreamer's mind while reading during the day. After waking up, the





Figures 9 and 10.

body is particularly tired, the heart is some depressed rapid feeling. For the rapid recording of the painting, because of the blurred memory, there are some modifications, the elements and colors in the dream in the mind and some enhancement, and other memories and ideas staggered, and make it into a stronger symbol. It is these changes in consciousness that enable this work to form.

It can be seen that a large number of red and yellow in the dreamer's picture indicate the inner struggle of the dreamer in the process of understanding the Buddhist Sutra, while the chaotic dark color shows the essential escape and fear that the dreamer is unwilling to face after the illusion is being stripped away.

4. Discussion

The purpose of this study is to investigate the influencing factors of the dream palette of creative people, people in art work or students with relevant art learning experience. From the data results in Table 1, Table 2 and Table 3, Among the 120 people, 107 people thought that dreams were colored, accounting for 89.17%. The frequency of color appearance in dreams, among which the "Most of the color" project is 43 people, accounting for 35.83%; The project of "Almost every dream is in color" is 76 people, accounting for 63.34%. It can be seen that the frequency of the tested dream color is very high. Almost all of the dreams are in color. As can be seen in the data results on the emotion frequency. These artists participating in the test believed that emotions appeared more frequently in dreams than those without emotions. we can see that the dream colors of art workers are frequent, and the dream color disks are diversified. The proportional distribution of the artist's dream palette is related to continuous supporting memory, emotional memory, creativity (spontaneous idea), and goal. (Robert J. Hoss, 2010) Psychological factors, such as emotion or emotional intensity, may have a dominant impact on the recall of specific or specific colors in dreams. In terms of the color ratio of the dream palette, the results showed that 89.17% of human dreams were colorful, and the proportion of blue, red and yellow was the highest. Through the analysis of the dream paintings of the three graduate students of the painting department, we can find that the dream pictures and colors of the three painters are related to the things in real life, and the dreams of the two female painters are mainly blue and black, and the pictures are dreamy and clear. The emotional intensity in the dream is not protruding. Another male painter's dream is mainly yellow and red, and the picture is vague and abstract. The emotional intensity in the dream is relatively prominent, and there will be anxiety, depression and fear, and after waking up, the body will have symptoms of discomfort. Tables 4 and Table 5 detect kurtosis and skewness for continuous supporting memory, emotional memory, creativity (spontaneous thoughts), and target variables. As well as confirmatory factor analysis results, composite reliability (CR) and mean variance extraction (AVE), Verify that continuous supporting memory, emotional memory, creativity (spontaneous ideas), and target all have a significant impact on the formation of dream color discs. Among the structures with the highest internal consistency is the emotional memory.

The three painters are very sensitive to color, creative and imaginative, and can do a high level of reproduction of the dream scene, but there is also a lack of memory of the process of transforming from the dream picture into the



painting. At the same time, through the analysis of dream paintings and interviews with the three researchers, it can be seen that the proportion of dream color palette is also affected by spontaneous ideas, because of the long-term contact with color and artistic creation, the dream visual imaging of painting workers is a combination of purpose and sudden. Therefore, creativity has a significant impact on the dream color frequency of artists.

The experiment of dream painting presentation is a purposeful operation, where the participants will deliberately remember the dream picture or specify the color, or repeat the dream of a special thing. Such as the repeated image of a cat in the paintings of Chen Xinyu. The study of factors for dream palette formation is an area to explore in depth. Specific the population range to art workers is conducive to collecting more concrete dream images. For art work groups, interpreting their own dream paintings can better understand themselves, examine themselves, and present the subconscious world of dreamers through the memory of colors and object elements, which is conducive to the release of life emotions and artistic creation. Color is not only an essential aesthetic element in artists' creation, but also the medium for conveying emotions and values. It can leave a long impression in the visual nerve of the viewer, and is the most direct visual language. Sometimes a color represents a style, representing an artist, and only through the interpretation of these colors can you enter the inner world of the artist.

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APPENDIX A

Part I: Respondent's	Demographic	Profile
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- 1 What is your gender?
 - O Male O women
- 2 What is your identity?
 - O Teacher
 - O Student

Part II:Frequency problem

- 3 How often have you ever dreamed in the last year?
 - O never
 - O About 1 to 5 times a year
 - O About 1 to 5 times a month
 - O About 1 to 5 times in one week
 - O There are every day
- 4 Do you think dreams have a color?
 - O yes O no

- 5 What are the main colors of your dreams?
 - O gray O black and white O achromatic colour
 - O multicolour
- 6 How often are the colors you see in your dreams?
 - O Almost every dream is colorless
 - O Most colorless
 - O Colored and colorless frequencies are similar
 - O Most of the color
 - O Almost every dream is in color
- 7 Do you have any emotions in your dreams?
 - O Almost every dream has no emotion
 - O Most of the dreams are without emotion
 - O The two are similar in frequency O Most dreams have emotions
 - O Almost all dreams have emotions

Part III: Measuring Variables

Please answer the following question by mark "X" in the space given below and do kindly answer truthfully and complete all questions.

1 = strongly disagree

2 = disagree

3 = neither agree nor disagree

4 = agree

5 = strongly agree

No.		1	2	3	4	5
	Continuous support memory (CS)					
1	Dream colors are related to life experiences.					
2	The colors of things experienced during the day will appear in the dreams.					
3	Look at a color for a long time, and that color will affect the color of the dream.					
4	Colors in the working environment can affect the dream tone.					
	Emotional memory (EM)					
5	The colors in dreams have something to do with your emotions in real life.					
6	Dreams are colored and gentle in a positive mood.					
7	Dreams are protruding in a single color in negative emotions.					
	Creativity (CR)					
8	The richer the imagination, the more strange the dream content, the more layers.					
9	In a sober dream, you can make bold imagination.					
10	Imagination can make dreams clearer, Dream colors are more diverse.					
	Target (TA)					
11	Fall asleep with purposeful tasks and let you know you're dreaming.					
12	Sleeping with purposeful tasks gives you the opportunity to dream of specified things.					
13	Sleeping with a purpose task will have the chance to dream of the assigned color.					



Part IV: Dream Report Collection

One: dream diary

(Time, story content, color of things, etc.)

Two: Self-dream analysis

- 1. Whether the mood in the dream affects the mood after waking up, the length of time.
- When you dream of eating or food, do you wake up hunarv.
- What parts of the body are uncomfortable after waking up, or what are the hidden dangers of the recent physical examination.
- 4. Do you know that you are dreaming, and that you can edit the direction of your dream.
- After this dream, whether any lucky or unlucky thing happened.
- 6. Make a small analysis and summary of their dreams, from the life experience, personality, emotions, desire and other aspects.

(Thank you for your dream case sharing)