

# A Study of Color Metaphors in Moral Concepts of 3-5 Years Old Yi and Bai Children

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**Abstract:** The moral concepts of color metaphors were explored through a picture compulsion task in which moral/immoral image pictures were placed on white or black color blocks for 3-5 years old children. The two experiments revealed that 3-year-old Bai and Yi children did not yet have moral concepts of color metaphors and there was no significant difference between the two; 4 years old Yi and Bai children had a preliminary awareness of the moral concepts of white Yi and black color metaphors, and there was a significant difference between the two. 5 years old Bai children had a stronger awareness of color metaphors and the difference was significantly larger. The results show that there are differences in the white-black color metaphors of moral concepts between 4-5 years old Bai and Yi children. Ethnic culture influences the formation of young children's metaphor comprehension ability.

**Keywords:** Yi Young Children; Bai Young Children; Moral Concepts; Color Metaphors

## 1. Introduction

Color words can refer to colors and also express concepts [1]. The theory of conceptual metaphors emphasizes that metaphors are actually individuals using familiar experiences to construct unfamiliar concepts [2]. There is a theoretical system of metaphorical concepts related to the idea of color. It is argued that every individual possesses the talent to form color imagery through base emotions and actual movement. It is through this deep connection that has the ability to have a positive effect on people's thinking and behavioral patterns in an unconscious way [3]. The concept of morality has received the most attention in the research to date. Color like other abstract semantics also has certain social

properties. Morality is defined as an abstract idea used to assess whether a behavior or belief is right or wrong. Color as an abstract category is widely used in a variety of fields, such as law and politics, but its concrete connotations vary greatly across cultures. Of all the results, the black and white moral metaphor is the most obvious in terms of cross-cultural consistency [4]. In Chinese culture, the color red symbolizes warmth, beauty and light. In Indian cultural concepts, light symbolizes sincerity, while darkness implies fraudulent behavior [5]. According to a subjects recognized moral words faster in white font than in black font, the while the opposite was true under black font [6]. Researchers confirmed this metaphorical connection in Chinese as well, after an experimental study in several tasks. They believe that this connection is due to genetics, i.e., evolution has led to the two animals having the same or similar ways of perceiving certain things. Evolutionary theory elaborates that humans experience more danger and death in dark environments, resulting in anxiety and panic, while they feel safer and more comfortable in bright environments where they can avoid risks more effectively [7].

There are similarities and differences in the perception of black and white across cultures [8]. For example, a series of experiments were conducted to study the development of color naming in children of different ethnicities aged 3-6 years [9]. The theory of cultural cognition suggests that differences in human psychology and behavior are closely linked to differences in culture [10].

Yunnan Province is a place inhabited by many ethnic groups, such as the Yi in Ninglang Yi Autonomous County and the Bai in Dali Bai Autonomous County. In Nyingchi Yi-Autonomous County, there are many Yi ethnic groups living in the area, which migrated from Daliang Mountain in Sichuan Province, and

thus Nyingchi is commonly known as Xiaoliang Mountain. The Xiaoliang Mountain Yi ethnic groups respect black color, and the phenomenon of “respecting blackness” has been present in the entire civilization of the Yi ethnic groups [11]. The word “Shang” in “Shanghei” not only contains the meaning of “favorite, general fashion”, but also contains the meaning of “to be respected and revered”. “meaning”. The Yi people like black, respect black, still black phenomenon is manifested in all aspects: such as the color of clothing, the color of the house, and noble people. Therefore, the small Liangshan Yi side also has “black Yi” and “white Yi” this division, “black Yi” that is the noble aristocrats, “white Yi” that is the slave race. Black Yi means noble aristocrats, while ‘White Yi’ means slaves. Therefore, there are many taboos against the use of the color black. “Black” in the hearts of the Yi people has been far beyond a color, the Yi people's understanding of black has been beyond the sensory instincts and habits of life. In the Dali Bai Autonomous Prefecture, where many Bai people have been living for generations, white is the main color of clothing for both men and women. The Yi people of Lijiang Nyingchi Yi Autonomous County and Dali Bai Autonomous County are geographically close to each other, but their cultures are quite different from each other. Studying the cultural differences between the two ethnic groups is important for exploring the metaphorical connection between color culture and moral concepts in different ethnic groups.

In summary, metaphor is also regarded as a key cognitive skill in young children. On this basis, the explanatory power of the phenomenon was further examined by teachers of Yi and Bai young children of different ages. This study put forward the hypothesis that both Yi and Bai preschoolers possess this color metaphor and that there are significant differences in color metaphors for moral concepts between Yi and Bai toddlers aged 3-5 years. This finding not only provides evidence support for educational psychology, but also helps us to further understand the similarities and differences in people's perceptions of things and phenomena in different ethnic cultures, as well as the interrelationships between these similarities and differences, which in turn helps us to better grasp the

cultural differences between different ethnic groups. More specifically, 3-5 year old Yi and White children are morally capable of white-black metaphors.

## **2. Paper Experiment 1: A Study of Color Metaphors for Moral Concepts in 3-5 Year Old Yi Children**

### **2.1 Research Methodology**

#### **2.1.1 Subjects**

In a township kindergarten in Lijiang City, Ninglang Yi Autonomous County, a stratified whole-group sampling experiment was conducted on 90 young children of Yi ethnicity and Yi language. There were 30 members in the 3-year-old group; 30 members in the 4-year-old group; and 30 members in the group aged 5 years; there were equal proportions of males and females in all age groups. Two tests and a questionnaire were administered to the children before and after the experiment. All participants in this experiment received small gifts.

#### **2.1.2 Experimental materials**

In order to represent moral concepts, the researchers selected 26 animated pictures from a wide range of children's familiar picture books and movies, of which moral and immoral pictures each took up half. On this basis, an experiment was designed to study whether subjects would produce different levels of differences in moral judgments after reading these two types of pictures, and to analyze their influencing factors. A questionnaire was used to collect information about the subjects' level of moral cognition and attitudes toward the pictures. 30 college students assessed the moral depth, familiarity and emotional arousal ability of the pictures in five areas. In the end, the choices were: moral 10 pictures and immoral 10 pictures. The similarities and differences between children's and adults' judgments of morality were investigated in the experiment by comparing and analyzing the different types of pictures. The final statistical data revealed a significant difference between the two groups of experimental materials in terms of moral dimensions:  $t=25.73$   $p<0.001$ ; with the highest morality scores in the Hulu group, followed by the Snow White group and the immoral group, whereas there was no significant advantage in the neutral photo group. Based on the fact that

there were no statistically significant differences in emotional arousal and familiarity, a questionnaire was designed to measure the relationship between the level of development of “moral cognition” and behavioral outcomes. The morality and familiarity of the pictures were assessed in a group of 30 young children who did not participate in the formal experiment. The results showed that 97.1% of the children were familiar with the characters in the moral pictures, and 91.4% of the children correctly recognized the morality of the pictures. Meanwhile, there was no significant difference between the experimental group and the control group in the moral judgment task. This indicates that at this stage, the children have already gained a deep understanding of the animated characters in the experimental materials and can effectively identify the quality of their moral behaviors.

### 2.1.3 Experimental design and procedures

The design used was a mixed scheme: 3, 4, and 5 year olds, two moral types (moral and immoral), and two colors (white and black). The subjects were shown pictures of morality for each of the three different moral types. Age was the factor influencing between participants, whereas morality and color were internal to the participants. Subjects were categorized according to the specific information contained in their descriptions of moral behaviors, and a corresponding number of pictures were selected to be placed at the same level in order to determine whether or not the individual had good moral character. The dependent variable describes the proportion of participants placing different types of moral pictures in black or white squares. Subjects rated all pictures. The formal test was an interview conducted through a one-on-one question-and-answer format. The subjects were asked to make choices and answer questions as prompted, and to record the results of their judgments about the pictures. Prior to the start of the activity, the primary subject initiated a conversation with the participants in order to put them at ease. The subject was then asked to watch a morality tale, “I Have a Good Friend”, which he had created himself. For the experiment, a separate classroom with ample sunlight exposure and a peaceful environment was chosen for the purpose. The teacher played the video clip of the Animated Story using

multimedia. The main test team made a random selection of 20 morality-themed pictures, showing one to the children at a time to ensure that the participants had an in-depth understanding of the animated character. Based on what type of pictures the children preferred to look at, the main test had the children view the red and yellow moral type pictures first, and then had the children observe the green and blue moral type pictures. The moral type pictures were placed between the two color block pictures. Ask each toddler to choose a different color based on his or her own judgment before showing them to the master test in a certain order.

## 2.2 Results of the Study

A total of 90 Yi children participated in the experiment.1. The results of the experiment are shown in Table 1.

**Table 1. Frequency and Rate (%) of Subjects Placing Moral or Immoral Pictures on Black or White Color Blocks**

age groups	Moral Pictures		Immoral Pictures	
	White	black	White	black
3 years old group	153(51.00%)	147(49.00%)	151(50.30%)	149(49.70%)
4 years old group	117(39.00%)	183(61.00%)	185(61.67%)	115(38.33%)
5 years old group	94(31.33%)	206(68.67%)	203(67.67%)	97(32.33%)

A chi-square test was conducted to gain more insight into the subjects' progression in moral color metaphors, separately for different age groups of subjects' data. Firstly, a  $2 \times 2$  column table test was conducted on a group of 3 year olds and the results of the study revealed that the interaction between moral type and color was not significant in the group of 3 year olds,  $X^2=0.54$ ,  $p>0.05$ . This indicates that children can use color to characterize their moral type. In the group of 4-year-olds, the interaction between moral type and color is very obvious, with a value of  $X^2=68.76$ ,  $p$ -value less than 0.001, and  $\Phi$  equal to 0.34. Through further tests of goodness-of-fit, it is found that the simple effect of moral pictures on a black background is very obvious, with a value of  $X^2=61.48$ , and a  $p$ -value less than 0.001; and the simple effect of moral pictures on a green

color and the no difference between pairs of different color pictures. The simple effect of immoral pictures was particularly significant for white, with a value of  $X^2=60.13$ ,  $p<0.001$  further goodness-of-fit tests showed that the simple effect of moral pictures on green and immoral behavior was related to color. The interaction between moral type and color was significant in the group of 5 year olds with values of  $X^2=66.23$ ,  $p<0.001$   $\Phi =0.26$ . The findings suggest that children's moral pictures had a significant effect on their cognitive processing when presented, whereas immoral behavior was not preceded by a significant change in response pattern, suggesting that the selection of children's moral pictures was controlled to some degree. By a further goodness-of-fit test, we found that the simple effect of moral pictures was significant on a black background,  $X^2=60.32$   $p<0.001$ ; the simple effect of moral pictures was not significant on green, yellow, nor blue. The immoral pictures showed a significant simple effect on white background  $X^2=60.54$   $p<0.001$ .

The results of the study show that the first signs of moral conceptualization of white and black metaphors in the Yi children are in the age group of 3-4 years old. Among the 4-year-old Yi children, the proportion of those who put moral-related pictures on black or white squares exceeded 60%, and this age group has already formed the color metaphor of moral concepts, that is, the metaphorical connection of "black-moral, white-immoral". This age group has developed color metaphors for morality, i.e., "black-moral, white-immoral" metaphorical associations.

### 3. Experiment 2: A Study of Color Metaphors in the Moral Concepts of 3- to 5-Year-old White Children

#### 3.1 Research Methodology

##### 3.1.1 Subjects

In this experiment, 90 Bai children from a kindergarten in Dali Bai Autonomous Prefecture were selected according to the stratified whole group approach. There were 30 members in the group aged 3 years; 30 members in the group aged 4 years; and 30 members in the group aged 5 years.

##### 3.1.2 Experimental materials

Experiment 2 used the same materials as Experiment 1, i.e., 10 ethical pictures and 10

unethical pictures, for a total of 20 pictures.

#### 3.1.3 Experimental design and procedures

This experiment used the same picture forced selection method as Experiment 1, and the formal experiment took the form of one-on-one question-and-answer interviews.

### 3.2 Results of the Study

A total of 90 White children participated in Experiment 2. First, in order to examine the effect of age, statistical analyses were conducted in the direction of moral pictures and immoral pictures. The results of the experiment are shown in Table 2.

**Table 2. Frequency and Rate (%) of Subjects Placing Moral or Immoral Pictures on Black or White Color Blocks**

Age groups	Moral Pictures		Immoral Pictures	
	White	black	White	black
3 years old group	152(50.67%)	148(49.33%)	149(49.67%)	151(50.33%)
4 years old group	240(80.00%)	60(20.00%)	58(19.33%)	242(80.67%)
5 years old group	255(85.00%)	172(15.00%)	43(14.33%)	257(85.67%)

A chi-square test was conducted on the data of subjects of different age groups with the aim of gaining more insight into the subjects' progress in the moral color metaphor. Thus, a  $2 \times 2$  column table test was conducted on a group of 3-year-olds, which showed that the interaction between moral type and color was not significant,  $X^2 = 0.51$ ,  $p>0.05$ . This indicates that young children of this age have a preference for moral categories. In the group of 4-year-old children, the interaction between moral type and color is very obvious with the value of  $X^2=68.55$ , p-value is less than 0.001, and  $\Phi$  is equal to 0.23. Through further goodness-of-fit tests, we found that the simple effect of moral pictures is very obvious in the white image, with the value of  $X^2=67.48$ , p-value is less than 0.001; and the simple effect of moral pictures in the green effect and the difference between the choices for the three different color images, yellow, blue and red, are not significant. On black background, immoral pictures showed a significant simple effect  $X^2=66.12$   $p<0.001$  suggesting that there is an interaction effect between moral pictures and color, i.e., for different types of pictures, the presentation of moral pictures produces different effects. In the group of 5 years old

children, the interaction effect between moral type and color is very obvious with the value of  $X^2=65.76$ , p-value is less than 0.001 and  $\Phi$  is equal to 0.56. The results of the study show that children of different ages produce different patterns of responses to moral behaviors, but these patterns of responses are predictive of future outcomes. Through further goodness-of-fit tests, we observed that the simple effect of moral pictures on white background was very significant with a value of  $X^2 = 56.37$  and a p-value less than 0.001; the simple effect of moral pictures on green, yellow as well as blue was not significant. The immoral pictures showed a significant simple effect on black background  $X^2=61.40$   $p<0.001$ . It was found that at the stage of White children aged 3 to 4, moral concepts began to gradually show the representation of white and black metaphors. Among 4-year-olds, the proportion of morality-related pictures placed on white or black squares exceeded 80%, and the color metaphor of morality, that is, the metaphorical association of "white-moral, black-immoral", had already been formed in this age group.

#### 4. Findings

The study concluded that 3-year-old Yi and White children have not yet mastered the skill of understanding color metaphors; among 4-year-old Yi children, they have initially established the cognition that white and black correspond to moral concepts, and formed the metaphorical connection of "black-moral, white-immoral"; 5-year-old children have continued to progress in their cognition of color metaphors, and formed the color metaphorical connection of "black-moral, white-immoral". In the 4-year-old Yi children, they have already established their initial knowledge of the moral concept of white and black, and formed the metaphorical connection of "black-moral, white-immoral"; in the 5-year-old children, they have continued to make progress in the cognition of color metaphors, and formed the metaphorical connection of "black-moral, white-immoral". The Yi preschoolers have mastered the ability to use color metaphors to express white and black to indicate moral concepts. (2) The 4-year-old Bai children have already established the knowledge of moral concepts corresponding to the colors white and black, and formed the metaphorical connection of "white-moral,

black-immoral"; based on this, this study further examined whether there are gender differences in the moral concepts of the two genders of Yi and Bai children, and whether there are gender differences in the moral concepts of the two genders. On this basis, this study further examined whether there were gender differences in moral concepts between Yi and Bai children, and how this effect came about. 5-year-old Bai children continued to make progress in their perception of color metaphors, forming the "white-moral, black-immoral" color metaphor connection. White preschoolers have acquired the ability to use color metaphors to express the moral concept of white and black. On this basis, this paper further examined whether gender factors contribute to gender differences in black-white metaphors. Through the analysis of log-linear modeling, the results of the two experiments reveal that there are differences in the perception of black and white metaphors of moral concepts between Yi and Bai young children aged 3 to 5 years old. In the metaphorical mapping of black and white concepts to moral meanings, Yi and Bai toddlers showed their unique orientations. The Yi prefer to combine black with morality and white with immorality, which is consistent with the Yi's cultural viewpoint of "favoring black and disliking white", while the Bai show a set of cultural patterns that are contrary to tradition, in which they combine white with morality and black with immorality, which is also consistent with the Bai's traditional thinking of "favoring white and disliking black". This is also in line with the traditional thinking of the Bai, who "favor white and hate black".

The Yi and the Bai give different symbolic meanings to the same color words, so the same color has different cultural connotations for the two ethnic groups. Therefore, this study reveals how the differences in color culture affect the color metaphors of black and white.

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