

Cartoon Portrait Creation and Evaluation Framework

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ABSTRACT

It has always been a complex topic worthy of being discussed for portrait artists to internalize their creative concepts, express the sense of beauty through external forms, and make viewers feel their artworks to form sympathy. The general stereotype of aesthetic experience is that "the ingenuity of arts lies in mind," so it is believed to be impossible to quantify the research. Therefore, this study attempts to use the philosophy of "Tao Qi Bian Tong" in *the Book of Changes* to discuss the classic question of whether aesthetic experience can be studied; it also attempts to explore the influence of viewers' aesthetic experience and preference perceptions to explore the perceptual aesthetic experience through rational perceptions.

Keywords: cartoon portrait, Tao Qi Bian Tong, creative thinking, cultural creativity

1. INTRODUCTION

It has long been a stereotype that the sympathy between the viewer and the painting is experienced through aesthetic feelings and cannot be understood by scientific analysis. It has been an old philosophical question whether there is a necessary relationship between the viewer and the painting. It is true that many Western philosophers have opposed the use of cognition to explore this issue of aesthetic appreciation. Without the help of cognitive theory, the barrier between audiences and painting cannot be overcome[1]. Therefore, this study attempts to study from the book *Changes-Appendix One (Yi-Xi Ci One)* "Hence that which is antecedent to the material form exists is what we say as an ideal method; which is subsequent to the material form exists is what we say as a definite thing; transformation and shaping are what we call change; carrying this out and operating with it are what we call generalizing the method; taking the result and setting it forth for all the people under heaven is what we say as the business of life." (<http://www.eee-learning.com/>), which explains the spirit of the so-called "Tao Qi Bian Tong" that is used to solve the old philosophical problem of "whether aesthetics can be studied." This study also explores the factors that influence viewers' aesthetic experience and preference perceptions from cognitive and communication theories and explores perceptual aesthetic experience through rational cognition to bridge the communication gap between artists and viewers[2].

Nowadays, the spread of text-based information in cyberspace is limited by the cultural background of the viewers, especially the spread of information of text on international social media (e.g., Twitter, Facebook, Weibo, and Bilibili), and the threshold of decoding information is invariably raised. As a carrier of information, a cartoon can encode and transmit information through simple lines and bright colors, thus lowering the threshold of decoding information. In addition, compared with words, cartoons are more witty, ironic, and exaggerated in symbolic expressions, and the information coding and decoding methods with cartoons as carriers are more interesting and easier. Once again, cartoons come strongly into the scope of people's attention because of their unique convenience and entertainment in the process of spreading. Therefore, the cartoon is chosen as the experimental carrier for the study of the philosophical study of Tao Qi Bian Tong. Under the development of international and cyberspace, the keen perception of the methods of the spread of information leads to the discovery of the possibility of using cartoons as the carrier for the transformation among "Qi," the characteristics of "Bian" in interaction, and the practicality of "Tong" that represents simpleness. In addition, the study can also pave the foundation for the subsequent research on cartoons in other directions.

As an art form, the cartoon portrait is an important way of expressing emotions. Through their subjective understanding, artists exaggerate and deform the appearance and personality characteristics of the

depicted objects to achieve the purpose of subjective expression[3]. It is a cognitive issue worth exploring how the artist expresses the situation and mood of his creation and how the viewer understands the artist's creativity[4].

2. LITERATURE REVIEW

2.1. The core mindset of "Tao Qi Bian Tong"

The Book of Changes is the cultural wisdom left to us by our ancestors and the practical experience of our ancestors' lives; its philosophy is worthy of deeper exploration to form research theories, and its experience can be applied to practice in life.

In terms of semantic cognition, the so-called "Xing" is the same as "Qi" if used as a noun. As stated in Chapter 10 of the *Changes-Appendix One (Yi-Xi Ci One)*, "...what can be seen is called Xiang, what can be felt is called Qi...". Therefore, above the Qi and Tao, the essence is the abstract or spiritual level, and "Tao" is the law that is common to all things. Specifically, the Tao, the metaphysical invisible Tao body, is the breakthrough and transcendence of the Tao to the Xing (Ma, 2019). That is the cognition of the object in the subject's ideology. The Tao is invisible and exists in people's mental world in the form of thoughts, theories, and ideas. The Tao does not appear out of the air. It must be based on objective existence. People need to understand or learn the Tao based on objective existence. However, the Tao does not appear on its own, and not everyone can feel the Tao, and not everyone can obtain the Tao. Its emergence and condensation must come out through deep consideration and imagination. Its cognition of objective things breaks through the object itself. It forms a universal, regular, scientific, and objective theoretical knowledge by summarization and generalization.

Below Xing and Qi is the concrete and material level. Qi is a tool that is commonly used by all people. What is visible is the phenomenon, and the concrete thing is Qi. Qi is a concrete thing that has formed a form (*Changes-Appendix One*). Qi is the medium or substance used by the subject to create recognition of the object, and it is the form and the use of the object. "Qi" is the basis of the formation of the Tao, while the formation of the Tao is based on the Qi but also out of the ware. Qi can be known and felt by people and is the object that people know and understand. "Qi" is both the "starting point" of the formation of the "Tao" and the "endpoint" of Tao's function. When people learn about the world and grasp the law of the development of objective things, the ultimate purpose is to use or change the objective things. From "Qi" to "Tao" and then to "Qi," it is the process from understanding to changing behaviors. The interaction between the "Tao" and the "Qi" helps to complement their shortcomings to reduce their excesses.

The so-called "Bian" means they are complementary. The core thinking of "Xing" is rationality, and the broad interpretation of "Xing" refers to the most profound rational thinking in the wisdom of the sages. If "Xing" is used as a verb, it means changes, echoing the phrase "carrying it out and operating with it are what we call generalizing the method"[5]. As stated in Chapter 10 of *Changes-Appendix One*, "... in the sky is the Xiang, in the earth is the Xing, change is seen...". But the "Xing" is not just the change of the thing itself; its deeper connotation is mainly the change of human view of things, methods, and behavior. From the content of this study, "Bian" includes three elements. The first is the change in creation techniques, and the most typical one is the change in the way of presenting the portrait image in the research content. The second is the change in creative content, which is mainly reflected in the change in cartoon content. The third is the change of connotation. The cartoon is the carrier of information and also functions as the channel for expressing ideology and cultural connotation. Therefore, the cultural connotation of cartoons is not forbidden to remain unchanged. Cartoons can extend cultural features because of the different platforms, and they will also be given specific cultural connotations because of the circulation of products and the passage of time. "Bian" is the inevitable trend of art in the great historical process and also the necessary means under the development of art. Therefore, the subject of the Xing is human rationality, echoing "practicing is called Tong." "Bian" is the result and the means. If the above-mentioned law of change is followed, and there is no obstacle in the practical verification, it is called "Tong." When "Xing" is used as a means, the purpose of "Bian" is for "Tong." According to *Changes-Appendix One*, "When things reach their extreme, change occurs, after the change, they evolve smoothly, and thus they continue for a long time." The above principle of "Tao Qi Bian Tong" can be turned into a general rule, and the people of the world can be taught to apply it and make achievement, which is called "career." In this study, the "Tong" mainly contains two aspects. One is that cartoon portraits can maintain the wit, exaggeration, and entertainment of cartoons while efficiently conveying the information of appearance, identity, and characters of the characters in the paintings, considering both the common features and functions of portraits and cartoons. The second is to blend the expressive characteristics of cartoons and Chinese painting to allow respondents to accurately identify the identity information of the characters in the comic style. People understand the characters and feel their inner spirit through cartoons. Therefore, "Tao Qi Bian Tong," whether as an academic idea or a research method, can be applied to the people of the world[6].

2.2. Creation mindset of Tao Qi Bian Tong

The philosophy of "Tao Qi Bian Tong" connects cartoons and portrait painting together, enriching the direction of comics creation, affirming the value of cartoons in spreading information, and expanding the scope of application of cartoons. In terms of the creation of portrait cartoons, this study reiterates the creation experience of figure painting in traditional Chinese painting, emphasizes the creating techniques of drawing the spirit with the form, drawing the form with the form, transformation, and shaping, and carrying it out and operating with it. On this basis, the cognitive differences in the subjects' perception of the appearance, personality expression, and overall impression of portrait painting are investigated. The subjects' subjective preferences for the creation of portrait cartoons provide a reference for the creation of portrait cartoons.

This study starts from communication theories and combines conceptual models, communication theories, and cognitive engineering, and organizes these relationships into a "Tao Qi Bian Tong" creative mindset, as shown in Figure 1. The artists' encoding process of outstanding creative work includes the creative concept, the creative process, and the creative work. In terms of the creation philosophy, based on the principle of "Tao Qi Bian Tong," it goes from the metaphysical rules of thumb and thinking paradigms to the physical specific methods and process behaviors, and then through the

deep understanding and breakthroughs of tailoring with changes. Finally, it reaches expanding and practicing the breakthrough of rules and innovative mode of pushing and implementing. For the creative process, this study divides the creative process into four steps: setting the context, telling the story, writing the script, and creating the cartoon[7]. As for the creative works, according to their connotations, the metaphysical "Tao" is divided into subject, personality, and emotion. The physical "instrument" is divided into drawing the form with the form, drawing the spirit with the form, and transmitting the form with the spirit. According to this, the "Bian" of tailoring with changes is divided into direct metaphor, metonymy, and implicit metaphor. Furthermore, the expanding and practicing "Tong" is represented by simplification, expansion and reduction, and misplacement and distortion. Finally, the decoding process reached by the viewer includes: do you see, do you understand, and are you moved? The first level is that the viewer can see or perceive, which is the level of "forming a perception." The second level is whether the viewer can realize and understand its meaning, which is the level of "semantic perception." According to semantic perception, the third level is whether the viewer can perceive and correctly feel the artist's state of mind. The third level is whether the viewer can perceive and correctly feel the artist's state of mind according to the semantic meaning, i.e., the level of "inner feeling".

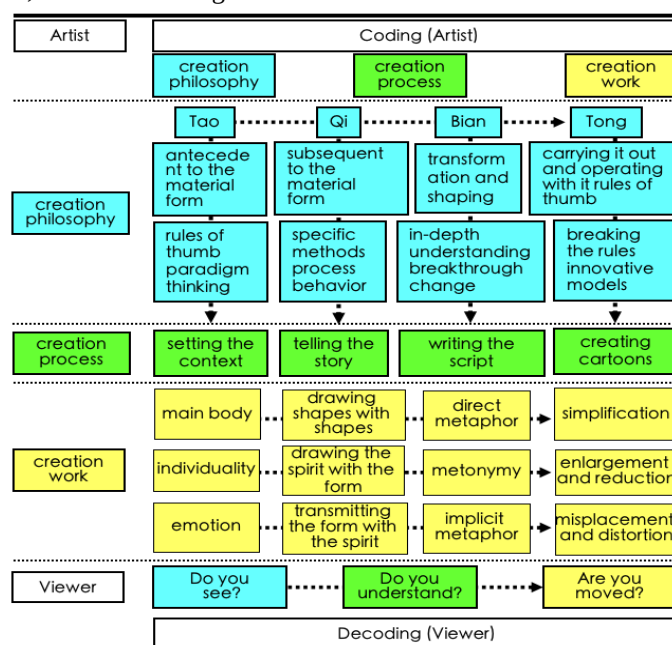


Figure 1 The structure of the creative mindset of Tao Qi Bian Tong.

3. RESEARCH METHODOLOGY - TAO QI BIAN TONG AS A FRAMEWORK

3.1 Research Process of Tao Qi Bian Tong

The research process is divided into three stages

based on literature exploration, theoretical construction, and analysis[8]. Stage 1 includes literature exploration and theoretical construction, explores issues related to mental models and communication theories, and constructs the theoretical foundation of Tao Qi Bian Tong. Stage 2 explores the artists' creative process and

practice and the core thinking of the Tao Qi Bian Tong, and the viewers' perception process and practice verification through case studies. In stage 3, after the preliminary test and expert interview, a questionnaire will be designed for matching test and preference assessment, and the data obtained will be used for statistical analysis, discussion, and verification of the core thinking and potential models of Tao Qi Bian Tong.

3.2 Case Study - The Practice of Tao Qi Bian Tong

The author of this study is a visiting scholar from mainland China at the Institute of Creative Industries Design, College of Design, National Taiwan University of Arts. During his visit to Taiwan, he took a course taught by Professor Lin Rongtai at the National Taiwan University of Arts, where Professor Lin applied communication theories to explain how the viewer decodes and test the viewer's understanding process. The so-called vivid feeling is "Did you see?", "Did you understand?" and "Are you moved?" Therefore, this study takes the process of creating cartoon portraits of Professor Lin as the subject of the case study and explores how the artists of cartoon portraits create according to the rules of thumb and the paradigm of thinking, so as to understand the creation process of cartoon artists from "drawing the form with the form," "drawing the spirit with the form," and "transmitting the form with the spirit." It also studies how viewers perceive the figurative and abstract contexts of the portrait artists. General cartoon artists freely draw materials that cannot be verified. In this study, Professor

Lin's portrait is used as a case study for this research, and the author is authorized to use it freely in the scope of the study, in order to construct a creative model of "Tao Qi Bian Tong."

This thesis refers to Lin (2007) and incorporates the contextual storytelling method into the design of cultural and creative goods and divides the implementation process into four stages: setting the context, telling the story, writing the script, and creating the cartoon. The creation of cartoon portraits can be carried out roughly according to these four stages. When portraying an object, the elements that can best show the characteristics and traits of the object need to be carefully observed, and each component with creativity is exaggerated with creation. Finally, the most suitable sketch image is selected, and the final cartoon effect is drawn by conscious distortion based on keen observation. The specific methods and creation process are as follows: (1) observing the features of the characters and facial of the depicted object, (2) analyzing the composition and proportion of the character features, (3) locating the relationship features and finding the rules and highlighting the features, and finally, (4) creating the cartoon effect by exaggerating the deformation and adjusting the modification. According to this case study, the whole process of cartoon portrait creation is explored. As shown in Figure 2, firstly, the personality of the created object is analyzed according to the creation process, and then with the encoding process of the artist, the result is conveyed to the viewers in the decoding process.

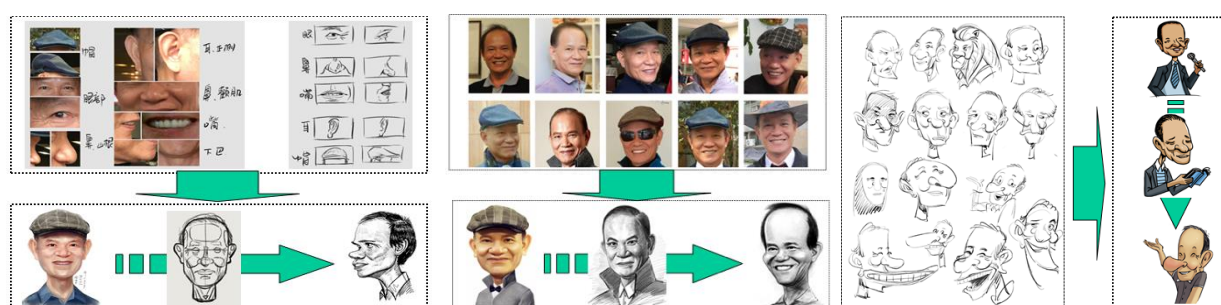


Figure 2 The process of cartoon portrait creation

4. TAKING THE RESULT AND SETTING IT FORTH - VERIFICATION OF THE TAO QI PIAN TONG

In order to verify the previous discussion, this study designs a quantitative research operation process to provide sufficient quantitative data as a reference for portrait painting artists. In the third stage of the research process in Figure 3, after the expert interviews in the preliminary test, a questionnaire was designed for matching test and preference assessment, and the information obtained was statistically analyzed, explored, and validated for the core thinking and

potential patterns related to "Tao Qi Bian Tong" [9]. The main purpose of this section is to provide a practical validation model, and the following is a brief description of the validation methodology and preliminary results.

4.1. Preliminary testing

In this study, according to the mentioned research framework, certain personality adjectives were set through the observation of the personality, face shape, and facial features of the characters, such as funny, graceful, and well-read. Then, based on these

personality adjectives, the cartoon portraits are created through the mentioned creation process. After sorting out the creation of the cartoon portraits, suggestions were made after subjective evaluations by the graduate students of the Ph.D. program of the Institute of

Creative Industry Design, National Taiwan University of Arts. Eight works of different styles were selected, and five works of other artists were selected to compile the test samples in Figure 3.

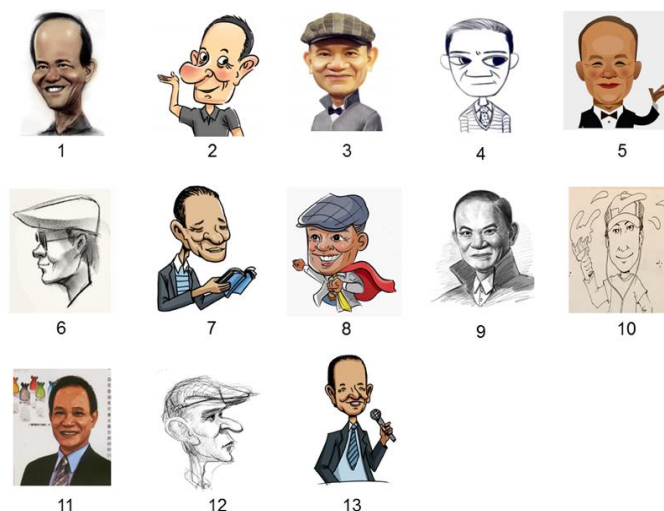


Figure 3 Testing samples of 13 cartoon portraits

4.2. Questionnaire design

With 13 cartoon works of "character creation," this study aimed to investigate the cognitive differences in perceptions of appearance, personality expressions, and overall specific viewers' impressions of cartoon book character creations. The questionnaire design consists of two tests[10][11]. In test 1, the participants were asked to subjectively assess the 13 cartoon creations using seven parameters. In test 2, the participants assessed with subjective preferences, including most creative, most humorous, best-loved, etc., and preferred work were selected among the 13 works. The questionnaire was placed on the Internet at the following address: <https://docs.google.com/forms/d/1AJPC8XoDdfEENq5kcUnbgaco0FQsR8oRwvyK503flmg/edit>

4.3. Subjects

This study invites people on social media who are familiar with the protagonists in cartoons to participate in the test. The participants were told the following message: "The purpose of this study is to explore how a cartoon artist shapes, exaggerates, or highlights the personality of the main character. A total of 202 subjects participated in the questionnaire via the Internet, of which 127 (62.9%) were male and 75 (37.1%) were female. The age distribution was 72 (35.6%) aged 50-59, which is the majority, followed by 62 (30.7%) aged 40-49 and 37 (18.3%) aged 30-39. The distribution of education degrees was 67 (33.2%) each for master's degrees and bachelor's degrees, and 27 (13.4%) for doctoral degrees. The backgrounds of the respondents were 103 (51%) in design and art-related fields, 44

(21.8%) in management-related fields, and 24 (11.9%) in engineering-related fields. The 195 valid questionnaires were collected and analyzed by correlation statistics, confusion matrix, and multidimensional rating as quantitative material for the discourse.

4.4. Assessment of creative attributes and multidimensional space

Due to the diversity of cartoon portrait creations, questions worthy of research and discussion include how to assess, what method to use, and what attributes to use. In this study, five creative attributes related to the assessment of cartoon portraits are cited by the subjects, and relevant literature is referred to propose seven creative attributes as shown in Table 1 that constitute the questions of Test 2. This test is a subjective assessment of the subjects for the 13 portrait cartoons according to the creative attributes, with a maximum score of 5 and a minimum score of 1. Table 1 shows the average scores of the 13 creative works on the seven assessed attributes. Creation (1) was rated highest in the assessment attributes of expression mastery (3), exaggeration (4), and drawing skills (5); creation (3) was recognized by the subjects in appearance characteristics (1) and personality expression (2); creation (8) is ahead of other creations in humor (6) and creative expression (7). In order to further explore the evaluation of each portrait creation in the seven assessment attributes, Table 3 was sorted according to its average value, for further analysis and exploration, especially for the performance status of creations 1, 3, and 8 in other assessment qualities.

Table 1 The average values of assessment of the creative attributes of the 13 testing samples

	1	2	3	4	5	6	7	8	9	10	11	12	13
appearance characteristics	4.10	3.24	4.21	2.79	3.63	3.59	3.12	3.65	4.00	2.67	4.06	3.68	3.37
personality expression	3.67	3.07	3.83	2.97	3.41	3.40	3.27	3.70	3.74	2.79	3.66	3.47	3.45
expression mastery	4.12	3.10	4.06	2.88	3.48	3.42	3.05	3.55	3.90	2.69	3.90	3.48	3.34
exaggeration	3.83	3.36	2.97	2.87	3.19	3.17	3.07	3.83	3.26	2.79	2.62	3.79	3.35
drawing skills	4.04	3.28	3.53	2.84	3.34	3.51	3.19	3.64	3.84	2.90	3.18	3.77	3.28
humor	3.72	3.41	3.27	2.52	3.35	3.13	2.87	3.79	3.00	2.81	2.81	3.26	3.35
creative expression	3.63	3.20	3.25	2.82	3.27	3.26	3.02	3.72	3.31	2.94	2.72	3.57	3.30

Table 2 The average values of assessment of the creative attributes of the 13 testing samples

appearance characteristics													
personality expression													
expression mastery													
exaggeration													
drawing skills													
humor													
creative expression													

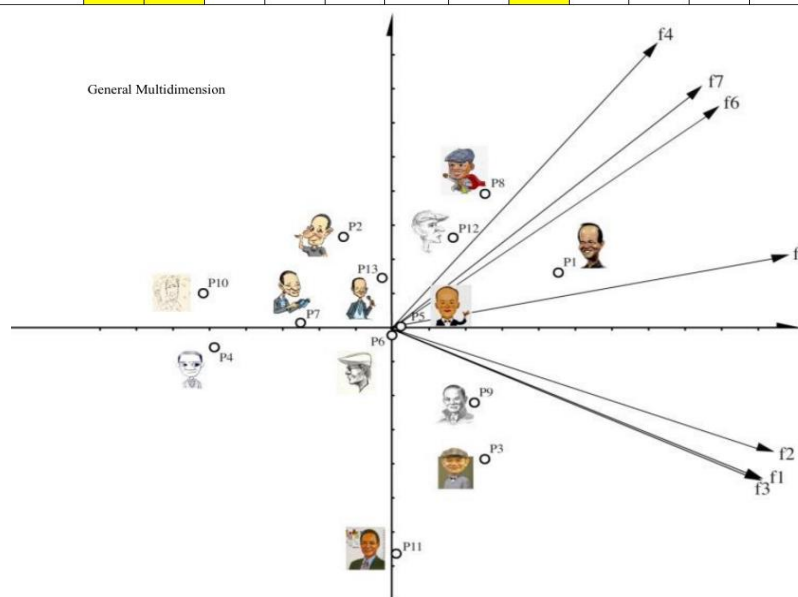


Figure 4 Multidimensional spatial distribution of the 13 portrait works

The information in Table 3 can be analyzed by using the multidimensional preference analysis (MDPREF) and the preferred cognitive space of the framework to explore the subjects' perceptions and influencing factors of creative attributes in different types of creative works. In this study, 13 portrait works and seven creative attributes of portraits were used to explore the preference of the subjects and structure the cognitive space of their preferences with the multidimensional preference analysis (MDPREF). It is expected to learn the subjects' preferences on products and creative qualities to learn the correlation and influence. The MDPREF preference space is basically a model with points and vectors on the coordinates to express the relationship between stimuli and their qualities. Taking this study as an example, the seven creative attributes are presented in the form of vectors. The coordinates of the seven creative attributes in the preference cognition space are sorted, and their spatial coordinate values are connected to the origin of the coordinates, which are transformed into vectors in the cognitive space. The relationship between the attributes can be shown according to the angle of each vector. Similarly, the 13 portrait works are displayed in spatial coordinates as points on the coordinate, as shown in Figure 4. In short, Figure 4 is a visualization of the information in Tables 3 and 4 in the form of the coordinate. The further away from the works, the greater the difference in attributes. For example, P1 and P10 are two poles apart in terms of style, expression, and connotation. The closer the works are, the more similar attributes they have. For example, P1, 3, 11, and 9 form a group, and P2, 4, 7, and 10 form another group. It is called clustering. Experienced designers can adjust the style of their works according to the phenomenon of clustering.

4.5. Subjective preferences and cognitive differences in portraits

Portrait artists have unique creative concepts, and the viewers have subjective preferences. How to form a sympathetic mode of communication between them has been an interesting issue worthy of discussion? Therefore, this study attempts to explore the influence of viewers' aesthetic experience and preference perceptions and to discuss the perceptual aesthetic experience through rational perceptions. There were seven subjective preference assessment questions in Test 3. The ratio of the top three subjective preferences for each question is shown in Table 3. In terms of subjective preference, it is completely "up to the mind." it is easy to win subjective preference but not necessarily the objective creative attributes. For example, No.11 was subjectively evaluated as the most authentic and earned a good impression in appearance and overall impression, but it did not score high on the seven creative attributes. However, products worthy of the name can be found by assessment based on subjective preference. For example, No.1 earned subjective preference assessments of the most humorous and favorite; No.3 received the best comments on appearance, personality, overall impression, and favorite subjective preference assessments. Both portraits performed well in the re-creation attributes. It is worthwhile to further explore how cartoon portrait artists can use the information from the analysis of the creative attributes of Test 3 to explore creative inspirations or revise their creative directions in the context of subjective preferences and cognitive differences[12][13].

Table 3 Top three subjective preferences of the 13 testing samples

Subjective preferences assessment questions	Top three subjective preferences of the 13 testing samples		
	No.11 47.7% (93/195)	No.3 30.3% (59/195)	No.9 11.8% (23)
3-1 Which one do you think has the most realistic feeling?	No.11 47.7% (93/195)	No.3 30.3% (59/195)	No.9 11.8% (23)
3-2 Which one do you think has the most humorous sense of humor?	No.1 33.3% (65/195)	No.8 30.8% (60/195)	No.2 11.3% (22/195)
3-3 Which one do you think has the most creativity?	No.8 27.7% (54/195)	No.12 19.5% (38/195)	No.1 15.9% (31/195)
3-4 Which one do you think best expresses the main character's appearance?	No.3 30.3% (59/195)	No.11 19.5% (38/195)	No.1 16.4% (32/195)
3-5 Which one do you think best expresses the main character's personality?	No.3 19% (37/195)	No.1 14% (27/195)	No.9 14% (27/195)
3-6 Which one do you believe best expresses the main character's general impression?	No.3 24% (47/195)	No.11 21% (41/195)	No.1 14% (27/195)
3-7 Which picture do you like most?	No.3 22.1% (43/195)	No.1 22.1% (43/195)	No.8 17.4% (34/195)

					
1	3	8	9	11	12

5. CONCLUSIONS

The main purpose of this study is to construct a model of creation and evaluation based on the "Tao Qi Bian Tong." Since the study is one of a series of studies on issues related to the "Tao Qi Bian Tong," it has not been exhaustive, but the preliminary results of the study can provide a reference for portrait artists and viewers.

The philosophy of "Tao Qi Bian Tong" mainly emphasizes the mindset of "which is antecedent to the material form exists is what we say as an ideal method," the method of "which is subsequent to the material form exists is what we say as a definite thing," the creativity of "transformation and shaping is what we call change," the expansion of "carrying this out and operating with it are what we call generalizing the method," and the principle of "taking the result and setting it forth for all the people under heaven is what we say the business of life." It is in line with the general rule of transforming experience into knowledge. Cognitive and communication theories mainly explore the relationship between connotation and denotation. A successful portrait cartoonist must master the inner meaning of the subject's characteristics and expressions, create the outer form through creative design to attract viewers and let them feel the context of the outer form, meet the audience's need for personal experience through the experience of the external form that sets off textured artwork, and finally, the experience of moving the audience is achieved (Lin et al., 2015). Relevant information shows the apparent discrepancy between the assessment of creative attributes and subjective preferences. The reason is that portrait painting is an external figurative form, and its perception is simpler than the internal meaning of personality idioms. How the viewers evaluate the external form of portrait paintings based on the intrinsic meaning of personality idioms is worth further exploring.

This study starts from the philosophy of "Tao Qi Bian Tong." Through the creative concept, technical performance, and creative method of the portrait cartoonist, the study constructs a method of evaluation from the viewer's perception, cognition, and moving process to verify the feasibility of the creative structure of "Tao Qi Bian Tong." The preliminary results of the study have already verified the feasibility of its practical operation. Future research should be conducted through a more comprehensive experimental design for practical validation research. The following variables and influencing factors should be considered: (1) the skills

and personal experiences of cartoon artists; (2) the personality tendencies and subjective feelings of cartoon artists; (3) the background of public aesthetic perception; (4) the performance of the overall style of the work; (5) the performance of the personality characteristics of the characters; and (6) the evolution of time trends and the interest of the community.

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