APPLICATION OF PSYCHOLOGY IN DESIGN FROM THE PERSPECTIVE OF VISUAL COMMUNICATION

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Abstract

Visual communication design is an interdisciplinary practice that greatly facilitates communication and interaction. This paper mainly explores the application of psychology in design from the perspective of visual communication. First, the relevant concepts of psychology and visual communication were introduced in details. Next, the literature on psychology theory and visual communication design was thoroughly reviewed. Finally, a questionnaire survey was conducted on experts, professors and college students on their attitudes towards visual communication design. The results show that different subjects perceived and felt about the same visual communication design in different ways, and designers should fully understand the psychological reactions of different groups of audience. The research findings shed new light on the application of psychology in design.

Key words: Visual Psychology, Visual Communication Design, Application.

INTRODUCTION

For the visual communication design, the concepting and creation process are inseparable from the audience, that is, the importance of customer's intervention in purchasing commercial design services (Lou, Chen, Nan et al., 2017). In the designing process of one object, the customer is often dominant in the interaction with the designer and directly participates in the design. If a designer wants to change from a passive state to an active state instead of accepting and obeying any suggestions and requirements of the customer passively, he or she must actively understand the customer's purpose, motivation and needs, perceive the audience's psychology, and change from passive acceptance to proactive guidance, which provides the ultimate satisfaction of both

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sides for the design. In this way, the designers shall have close interactions with customers, and their design and production can naturally achieve twice the they are alienated and difficult to communicate with each other, it will bring difficulties to design and production, and the quality of design will also be affected, while the consumers are becoming more and more critical as a major feature of the consumer society. Consumption is not only about material consumption, but more importantly, symbolic consumption and aesthetic consumption on the material. Therefore, design has an irreplaceable role in consumption, leading to the rapid development of the design industry. Designers provide signage, advertising, packaging, planning, consulting, and other commercial design services to most industries or departments with the goal of making their business activities more rational and orderly, and creating greater productivity and business profits. Any industry that wants to promote can't leave design. From production to sales, from product to brand, from concept to culture, design runs through all aspects of product

production and communication. Visual communication design is an important element in the consumer field (Garcia-Retamero & Cokely, 2017). The entry of goods into the consumer circle requires visual communication design, using various visual means to clearly display the products, while stimulating the purchase of consumers. Effective design is a powerful means of stimulating consumption. After the designer's conception and creation, the merchandise exudes greater appeal, triggering the consumer's motivation to purchase. Thus, in order to help designers better understand their needs and provide effective design solutions, it is necessary to understand and study the ideas, strategies, actions and directions of the audience in the production and consumption fields. Over time, designers can explore design methods in a rational way, that is, serving the audience while ensuring a good theoretical framework for each subject. The study of design is to learn from the designer, from learning the design information of the audience to accepting it. With the in-depth development of the design, the designer must consider the subjective factors and analyze the psychological state and characteristics of the audience in the design process. Therefore, the research on audience is a good entry point to understand the design.

Psychology has begun to be used internationally in the fields of design and natural sciences (Terrier & Cellier, 1999). In China, modern design always conforms to the development of international design theory at each stage. Especially since the end of the 20th century, despite the great influence of the international community, China's research on design art has gradually entered the state of rational thinking. Its design has already involved many theories about psychology, buta unique and complete design from the perspective of psychology needs to be formed. The academic system still has a long way to go. Therefore, it is necessary to conduct more in-depth and systematic research. Currently. there are also many monographs on design psychology at home and abroad, which mainly have introduced the user experience of industrial design (Zinn & Mc Donald, 2018), and described the convenience, comfort and satisfaction of the user in using the product in detail. In addition, in the aspects of advertising design, brand design, digital interface design, and information design for specific media communication, there have been many researches on cognitive psychology and customer psychology, but not deep, comprehensive and systematic enough. In this era of image culture, higher requirements for design information have been raised for designers, and then understanding the audience's psychology has become one of the compulsory courses for designers.

Wood & Rünger (2016) tend to repeat the same behavior in recurring contexts by studying habitual biology and obtained the behavioral motivation and neurobiological characteristics to describe habits, thereby identifying three ways that habits interface with deliberate goal pursuit. Nikrahan, Suarez, Asgari et al. (2016) were concerned with superior cardiac outcomes by studying positive psychological characteristics, and then in this exploratory study, evaluated positive psychological interventions in patients who had recently undergone cardiovascular disease treatment procedures. Shi (2018) presented an intelligent color correction method for logo patterns in visual communication design and conducted simulations to find that the proposed method can effectively identify the logo pattern, and the corrected logo pattern is not distorted and has strong robustness. Garcia-Retamero & Cokely (2017) proposed a conceptual framework that describes the impact of computation on risk literacy, decision making, and health outcomes, then systematically reviewed the benefits of visual aids for risk communication, with different levels of computation and Chart, and identified five practical, evidence-based guidelines for heuristic evaluation and effective visual aided design, which finally concluded that visual aid is especially beneficial for people with weaker and less skilled skills, and well-designed visual aids are often an effective tool for improving informed decision-making by decision makers. We.

In view of the above, this paper aims to explore the application of psychology in visual communication design. For this, with reference to relevant monograph materials and literature (Cheng, Ou, & Kin, 2017), it introduced the related theories of visual communication design concepts and used the questionnaire survey to analyse the influence of psychology on visual communication design. It provides useful reference for researchers to further study the application of psychology in design from the perspective of visual communication.

RELATED CONCEPTS OF PSYCHOLOGY

The inevitability/intentionality of psychology

The main feature of psychology is the intentional random state, which has the objective ability to explain and predict the behavioral ability in daily social interactions (Choudhary & Amiel, 2018). Cognitive psychology is not an independent activity. It is definitely not separable from cognitive individuals, but exists in a holistic form. This requires us to exist as a whole, which must be based on two basic facts. One is that only the existence of an organism can have a soul, and the other is that the cognitive process requires the organism to be realized in the overall form of intelligent agents. So, the mental cognitive patterns cannot balance the behavior of intelligent agents. It's generally thought that intelligent behavior is the behavior of rational objects, because people can understand each other's goals that they believe or want to achieve, and their behavior is usually reasonable and understandable. The way in which each other's behaviors are understood usually requires an explanation of their speech or behavioral content, which in turn wants the other to have a combination of intentional states that are consistent with us, and a series of coherent preferences analysis processes. All in all, the interpretation of other people's daily behavior is in fact a re-construction process that is reasonably explained. Psychology mainly includes three characteristics. First, rationality comes from the identifiability of consciousness; second, coherence is the process of penetration of cognitive psychology, that is, with the beliefs, expectations or other intentional changes, the cognitive psychology subject will also change the infiltration process of cognitive psychology accordingly, which is the inherent interpretation of the propositional attitudes of cognitive individuals; third, consistency is reflected in the set of intentional random states.

The concept of intentionality in psychology is the basis of social psychology interpretation, which highlights the characteristics of social culture, and also allows researchers to understand people's cultural behaviors with cultural characteristics. In the context of the same culture, we enjoy universal cultural resources and at the same time form a common life value, making communication and integration between them more convenient. There is also a difference in the intentional gathering between different cultures. This difference is mainly reflected in the specific cognitive psychology. The huge difference between the psychological culture of a certain cultural circle and the psychological culture of other cultural circles is reflected in psychological behavior and psychological intentionality.

Overview of psychological interpretation

The objective reality of psychology at the level of methodology is unquestionable, but ontology has always been the problem that plagues psychology. Psychology is also a foothold for further exploration of psychological interpretation and psychological integration, and the path of explaining psychological phenomena is not necessarily the true path. This is a process of psychology-based philosophical discussion about epistemology. Different perspectives on psychological interpretation determine the different interpretations of psychological concepts and will also change with the concept of psychological interpretation and the next level of subject interpretation. Meanwhile, different concepts of the "basic" psychology category and other examples of interpretation at the individual level determine the rationality of the conceptual distinction in vertical interpretation. Therefore, on the basis of the scientific theory of philosophical epistemology, we can find the feasibility of the fusion interpretation and other interpretations of psychology by studying psychological phenomena in different disciplines etc.

The nature and mechanism of psychological interpretation

The roles of psychology in social interaction have a certain commonality. There is an un-simplified standard dimension in psychological interpretation, and the low-level interpretation is a scientific descriptive psychological interpretation, which is different from the standard psychological interpretation. The philosopher clearly distinguishes our understanding of behavior such as the specific behaviors of intentional behavior, beliefs and expectations, as well as conditioned reflexes or others behaviors. As above, the propositional attitude determines the intentionality of psychology, for a direct object to solve the path

of psychological interpretation at different levels, which clarifies some concepts in psychology and contributes to the interpretation of psychology.

Propositional attitudes of psychological interpretation

The term "propositional attitude" in psychological interpretation comes from logic, which inherits the analytic philosophy from the Anglo-American spiritual philosophy. Propositional attitude refers specifically to a meaning, including intrinsic intentionality and psychological representation, which is expressed in the form of attitude types and propositions. The content of the propositional attitude contains the semantics of a state, and it is a kind of psychological content or thinking content. In vocabulary usage, it can represent both psychological characteristics of conscious experience and conscious attitudes. In explaining behavior and psychological phenomena, it's divided into two categories: the attitude of proposition, and the internal phenomenal experience such as the feeling, perception and emotional experience of the body. The former is a conceptual and propositional content, while the latter is an empirically based content that is non-conceptual and manifests itself as a vivid and direct experience. Besides, the two can be exchanged during the use, and the meaning is naturally different. The former mainly expresses the content to be displayed by specific propositions, and the latter mainly points to a type of attitude. In a sense, psychology can be seen as a psychology of propositional attitudes, a daily means of interpreting and predicting the behavior of others. Propositional attitude is a complex system that can play different roles in different philosophical meanings and use its descriptive language and its own characteristics to achieve the coherence, consistency and rationality of psychological interpretation.

Causal effect of psychological interpretation

The causal effect of psychology in daily life interpretation is very necessary because it plays an important role in the study of scientific psychology, and even psychology explores the important foundations of the Kuhn paradigm in scientific iterations. Psychology has the ability to predict behavior and explain psychological phenomena. It is widely believed that this causal relationship exists based on class rules. Through the generalization of intelligent agent behaviors to achieve the purpose of interpretation and prediction, this inherited the traditional physics interpretation of causality. In addition, psychology has three types of causal effects, which are in order: the intrinsic term of causal effect, the anomalous monism, and the meaning of the counterfactual fact.

(1) Intrinsic term/internal items of causal effect

Starting from the usefulness and accuracy of psychological interpretation, the intrinsic items are derived, which is opposite to the attitude type of propositional attitudes, such as beliefs and expectations. Therefore, intrinsic items that are effective and causal are needed. Generally speaking, the predictive effect on behavior, the explanatory power of propositional attitude in the intentional position is obviously better than the interpretation based on physical location or design location. This intentional position helps to predict behavior. It is necessary to emphasize that this behavioral prediction is not the same as the purpose-based theory of using a thermometer as an intentional system. Its scale changes are unpredictable. We should define causality based on factors that arise from different adaptations to environmental conditions, rather than as an independent observer.

(2) Anomalous monism

Anomalous monism is the definition of event characteristics in physics terms and is unlikely to be a causal rule between psychological events. In fact, these causal rules exist between psychological events based on physical descriptions, and preserved causality. Therefore, how to unify the principle of anomalousness between causality and mental state in psychological interpretation becomes the primary problem. The objects of psychological interpretation are still dominated by rationality, coherence and consistency. In the methodology of psychology, we often need to explain the tendency of others' behavior from the perspective of synchronicity and historicity. In other words, it can be assumed that there will be a tendency for the agent to be in a particular situation. Therefore, when we try to explain the behavior of the subject of psychology, we should explain the behavior of others' inclination from the perspective of synchronicity and historicity, i.e., considering its preference from

synchronicity and historicity to ensure the consistency of interpretation. However, there are more choices between synchronicity and historicity when interpreting choices. In the face of this choice, we don't have any information content to rely on, so how can we more effectively choose between synchronicity and historicity and ensure the rationality of behavior prediction? Then you need to ask about this swing choice. Is there a hidden "real" preference? It can be seen that predicting this behavior is necessary to identify the intentional attitude hidden below, which is the key to predicting behavior.

(3) The causal effect of the counterfactual facts

It is generally believed that if psychological interpretation is a causal explanation, then the generalization of psychology must be the study of causal rules. But there is also a view that is contrary to the cause and effect of the mind, and that a particular combination of mental states leads to a specific behavioral causal relationship. If and only if the mental state combination is missing, it will lead to behavior. Even under different backgrounds and environmental conditions, the same combination of mental states will still produce behavior. The result is that the existence of causality depends on the true value of the conditional state, which is the causal judgment of the counterfactual fact.

ANALYSIS AND APPLICATION OF PSYCHOLOGY IN VISUAL COMMUNICATION DESIGN

The concept of visual communication

Visual communication is based on observation to achieve a way for people to interact with each other through visual semantics. Visual communication design is an effective means to display information to people through the use of visual symbols, fully embodying the rich content of the design and the characteristics of the times. With the birth of digital media, the traditional way of visual communication has received great challenges, and the visual communication mode has gradually evolved from static to integrated dynamic mode. At this stage, the designer in the visual communication design can satisfy the visual psychology of the people by fully mobilizing all the factors, thus achieving a more perfect visual communication effect.

The role of psychology in visual communication design

Psychology plays a very important role in visual communication design. The designer adopts a diversified approach, allowing people to feel the theme and content that the designer wants to express at the beginning of the design. Psychology is mainly reflected in the following aspects: First, when screening the key points of natural interest, it can help to continue to innovate and effectively express this innovative way of thinking. Secondly, when the comprehensive use of high-tech technology breaks the limitations of time, space and geography in visual communication design, and presents a virtual feeling, designers use positive and negative shapes to rebuild images and gradually form interesting ideas. When human beings eliminate their inner doubts through various channels, it will strengthen the interaction between people and design works, and provide a platform for mutual communication.

The specific application of psychology in visual communication design

Depending on where the object is in different spaces, the object is imaged and transmitted to our brain. There exist certain differences in the imaging of the left and right eyes of the human body, so various hallucinations may be formed in the vision. In the visual communication design, the two-dimensional space works in an abstract way, which can form a design effect combining illusion and reality. The specific application of psychology in visual communication design effectively expands the designer's way of thinking, improves their thinking ability, and help tap their potential and create visually more aesthetically pleasing designs. Besides, the spatial representation of an object has multiple dimensions, and the composition of each dimension is also different. The one-dimensional space is mainly composed of lines, and the two-dimensional space is mainly of length and width; relatively speaking, the four-dimensions space is more special, including length, width, depth and time; the five-dimensional space is more surreal, mainly through the perspective principle or new media to produce multiple spatial effects. In the current stage of graphic design, space design is mainly divided into actual or virtual space. It can deepen the overall design by processing the

color, pattern or spatial position and near-far relationship of the object image, and combining the spatial devices.

Research on the space construction of psychology in visual communication design

As above, in graphic design, space can be divided into virtual space and real space, and the positional relationship between the top, bottom, left and right as well as the space level before and after are generated by patterns, colors, and the like. The virtual reality method focuses on "virtual reality" in the process of processing, which is not only a performance method but also an observation method. It's often used for painting. According to this method, we took an example for the space construction of psychology in design. The image is erected in front of the transparent glass, and the three-dimensional image is recorded in a two-dimensional space. This image is a perspective view. When the particles in the air change and move, the light is absorbed by the scattered light, so the object is hit. Compared to nearby objects, the objects in the distance are relatively blurred, and the texture and its outline are not easily noticeable. Light and darkness and saturation are directly attenuated by light. This is because the light is directly irradiated and the concentration of light is low. At this point, we need to adjust to the best visual effects. Therefore, we habitually believe that objects exist in three-dimensional space. In short, the design purpose is to provide viewers with different visual enjoyment. We are always willing to seek special visual stimuli. So, we are not just satisfied with the simulation of reality, we will slowly look for visual effects that can shake our own vision and spirit. To this end, people must not only imitate the three-dimensional space in two-dimensional space, but also use new media and new technologies to create surreal space that does not exist objectively. Although this surreal space does not exist by itself, it seems grotesque. It is precisely because this surreal space does not exist objectively, it greatly reflects the infinite creativity of human thinking. The form of surreal space is never fixed, and its creativity depends on the creator's thinking and imagination. It can be proved that human thinking is capable of getting rid of the limitations of objective conditions. As long as you think of it, you can express it, create it, and use wisdom to express

your understanding of nature and the world. This may be because designers sometimes are like magicians, always showing incredible visual effects.

RESULTS AND DISCUSSION

Literatures on psychology theory and visual communication design

This paper analyzes 500 articles on psychological theory, including 350 journals and 150 masters' theses. Among them, there were 125 related articles in the field of visual communication design theory, including 89 journals and 36 theses, as shown in Figure 1.

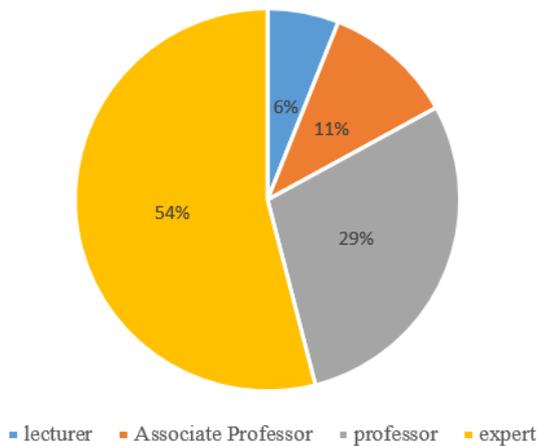*Figure 1*. **Related articles of the survey**
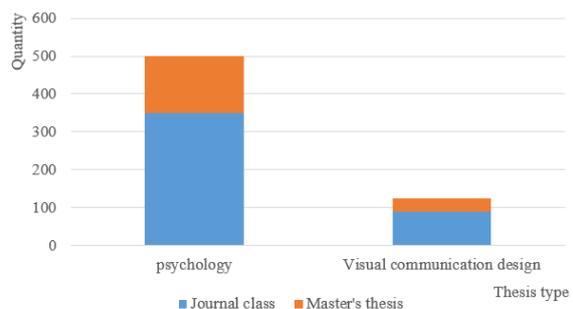
Through the relevant literature research on psychology and visual communication design in Figure 1, the relevant theories were summarized, e.g., visual graphic creation, the design style of psychology and visual communication. The basic principle of visual graphic creation is to disseminate information and take the creative thinking mode as the guide to find unique and novel ways of expressing thoughts. Unique and novel works will attract people's attention, interest and first impression, let people have a new understanding of things and create new ideas and wisdom. The visual communication design should have an extraordinary artistic conception and a unique aesthetic taste, which gives people the pursuit and guidance of beauty. It is not simply a process of seeking a novel visual angle, but a creative activity that always focuses on the dissemination of information.

A questionnaire survey on the application of psychology in visual communication design

Based on the status quo and development

characteristics of visual communication design at home and abroad, this paper established the evaluation indexes for the influence of psychology on visual communication design, and also the related theoretical framework. Then the questionnaire survey was conducted to 120 experts and professors in the region, including 65 experts, 35 professors, 13 associate professors and 7 lecturers. The composition of experts and professors is shown in Figure 2. And it concentrated the opinions of all experts to provide an authoritative basis. Meanwhile, another questionnaire survey was conducted among 3,600 college students in the region. The composition of college students is shown in Figure 3. A total of 3,720 questionnaires were distributed, and 3,460 valid copies were recovered, with the recovery rate of 93.01%. The validity of the two questionnaires were verified, as shown in Table 1 and Figure 4.
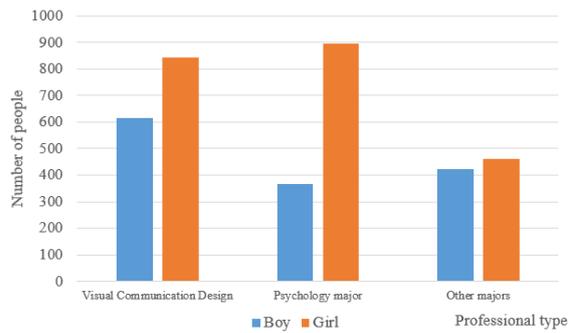
all have different impacts on the design of visual communication, i.e., the visual communication design is consistent with the gender, occupation, national lifestyle, the means of survival, and the aesthetic psychology of designers who grow up in a special environment.

Figure 3. **The survey on college students**

Figure 2. **The survey on Experts and professors**

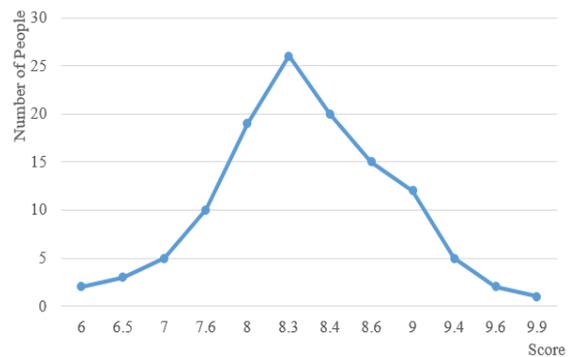*Figure 4*. **Experts on the statistical validity of the questionnaire structure**

Through the in-depth analysis of the questionnaires in Figure 2 and Figure 3, as well as Figure 4, it can be seen that the style of the times and the visual communication design are complementary and closely related; different design styles of visual communication appear with different eras, and also change accordingly; different genders, occupations, and nationalities

CONCLUSION

Today, as the media is becoming increasingly abundant, the art design field has been constantly expanding, and higher requirements have been proposed for the artistic creator's concepts. The designer not only needs to spend his or her energy on how to attract the attention of the audience, but also allows the viewer to feel what the designer wants to express without any effort.

Table 1. **Experts on the statistical validity of the questionnaire content structure**

Score	9.9	9.6	9.4	9.0	8.6	8.4	8.3	8.0	7.6	7.0	6.5	6.0
Number of People	1	2	5	12	15	20	26	19	10	5	3	2

First, the designer can extract interesting points from nature and present them with creative thinking. Secondly, the use of technology can break the natural boundaries, to display the illusion that does not exist in real life, and adopt the positive and negative forms to reorganize and form interesting concepts. This phenomenon combines the dynamic elements of space to form an extension of space, breaking people's inertia and producing visual stimuli. When our eyes see illogical images and phenomena, we will try to find out why; when we try to solve the doubts in our hearts, we will increase the interaction of the works and add opportunities for communication.

Therefore, in the future development of visual communication design, we will move toward a multi-disciplinary structure. In today's high-tech era, visual communication design and science and technology will be more closely linked. We need to actively discover the various visual possibilities that exist around us, and carefully observe how people can give us more new directions in design. Visual communication design must move toward intelligence, precision, and ultra-modernization, all of which need to be realized on the premise of scientific-based theoretical methods.

Acknowledgements

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