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The Aesthetic Framework of Unity in Variety: Connected Perception Theory Optimizes Aesthetic Experience

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Abstract
The Unity in Variety (UiV) principle is an important aesthetic theory that emphasizes the dynamic balance between unity and variety and is widely used in the fields of art and design. However, most of the current research on this principle focuses on specific cases and few studies have systematically sorted out its theoretical basis and mechanism of action. This paper uses a literature review method to conduct an in-depth review of the basic theories of the UiV principle, such as Gestalt theory, processing fluency theory and Arousal-potential theory, systematically explains how unity and variety each promote the generation of aesthetic pleasure and clarifies the interdependence and mechanism of action between the two. In addition, this study reviews the empirical research on the UiV principle in the field of visual and tactile aesthetics in recent years, pointing out that there is currently a lack of unified guidance framework when applying this principle in different design subdivisions. Finally, this study proposes a comprehensive model of the relationship between unity and variety on aesthetic pleasure (Unity-Variety Aesthetic Pleasure Framework) and suggests that future research needs to explore the universal applicability of this principle in a wider range of product categories and multi-sensory fields, in order to enhance its theoretical value and practical guidance.

INTRODUCTION

The Unity in Variety (UiV) aesthetic principle explains the key role of unity and variety in the process of aesthetic appreciation. The UiV principle proposes that aesthetic pleasure usually comes from the optimal balance between unity and variety[1]. Specifically, variety refers to the difference or degree of variation between design elements[2], while unity is reflected in the order and consistency between elements[3]. Although a large number of studies have confirmed the positive effects of unity and variety on aesthetic pleasure, there is still insufficient understanding of how the two interact and produce effects together. In addition, the existing literature has widely verified the universal applicability of the UiV principle in multiple aesthetic fields, including music, poetry, visual arts and product design[4,5]. However, most of these studies focus on specific application examples and less systematically explore the mechanism of action of unity and variety and their interaction in aesthetic experience. At present, the basic theory and model of the Unity in Variety (UiV) aesthetic principle are still unclear. Therefore, this study aims to deeply analyze the theoretical basis of the UiV principle, including the Gestalt principle, processing fluency theory and Arousal-potential theory, through a comprehensive literature review, in order to clarify how unity and variety can promote aesthetic pleasure independently and synergistically. In addition, this study will review and analyze the empirical research results in recent years to explore the scope of application and potential development direction of the UiV principle in the field of design. This study aims to propose a unified mechanism framework through a comprehensive theoretical and empirical review and clarify the development path of future research.

MATERIALS AND METHODS

To systematically review the Unity in Variety (UiV) principle and its applications, a comprehensive literature search was conducted using Google Scholar, supplemented by the snowball method. The search aimed to identify relevant academic publications addressing the development, theoretical basis and application of UiV in design and non-design fields. Keywords used in the search included “unity”, “variety”, “product design”, “industrial design”, “unity in variety”, “gestalt”, “aesthetic pleasure” and “aesthetic preference.” These terms were interactively expanded as new relevant keywords emerged during the review process. The initial search yielded 200 articles. To ensure relevance and quality, inclusion and exclusion criteria were applied. Only peer-reviewed articles published between 2000 and 2024 in English were considered. In addition, since the research papers involving core research have a long history, the conceptual papers can be extended to 1940. Articles were included if they discussed UiV principles in relation to aesthetic theories, industrial or product design, or explored its implications in broader domains such as interaction design or traditional cultural design. Grey literature, non-English publications and studies lacking substantial discussions on UiV principles were excluded. After screening titles, abstracts and full texts, a final set of 80 publications was selected for analysis. The selected literature was analyzed to identify theoretical underpinnings, developmental trends and practical applications of UiV principles.

The Analysis Focused on Three Key Aspects:

- The theoretical foundation of UiV principles and its alignment with Gestalt theory.
- The application of the UiV principle in design-related fields (especially industrial and product design) and in non-design fields.
- The applicability and limitations of the UiV principle in empirical research. This structured approach provided insights into the current state of UiV research and helped highlight gaps for future exploration.

Main Theoretical Basis of UiV Principle: The Unity in Variety (UiV) principle, rooted in the philosophical discussions of ancient Greece, has been a recurring theme in aesthetic studies for centuries. Early discourse on unity and variety focused on their roles in achieving harmony and balance in artistic works. Some studies have also applied it to art education[6]. By the early 20th century, scholars began to systematically explore the application of unity and variety to aesthetic appreciation in a variety of aesthetic contexts. Early explorations of UiV principles focused on formal expression[7]. Considered the UiV principle a common feature of most aesthetic forms, suggesting that unity promotes cognitive coherence, while variety stimulates curiosity and engagement. The UiV principle initially gained traction in the analysis of visual art. Some scholars have shown that Unity in Variety was first widely used in the exploration of aesthetic principles in visual art works[8]. This demonstrated that UiV was instrumental in understanding aesthetic responses to fine art. Subsequently, studies have shown that UiV principles could be generalized across high-art mediums, emphasizing how balance between unity and variety enhances viewer engagement[9]. For instance, Vincent van Gogh’s artwork exhibits both a high degree of variety and an underlying sense of unity, making his works prime examples of the principle in action[10]. Beyond visual arts, UiV principles have also been explored in other domains such as music, poetry and

graphic design[4,11,5]. These studies consistently highlighted the role of UiV in evoking aesthetic pleasure, demonstrating its interdisciplinary relevance. In the 21st century, the UiV principle evolved from a descriptive aesthetic concept into a more structured theoretical framework. Hekkert proposed the Unified Model of Aesthetics (UMA) based on Gestalt theory[12]. He believes that aesthetic research requires a complete and unified aesthetic model. The model believes that people's aesthetic preferences are mainly composed of the balance between their needs for safety and their needs for accomplishment. The UMA model contains three levels, among which the UiV principle constitutes the cognitive level. Unity represents people's safety needs and variety represents people's risk needs. UMA postulates that achieving an optimal balance between unity and variety maximizes aesthetic pleasure, marking a shift in UiV's application from art appreciation to systematic design principles. This integration into the UMA model elevated UiV from a purely aesthetic notion to a philosophical and psychological construct with practical implications. The introduction of UMA model has significantly expanded the scope of UiV research, with industrial design emerging as a key area of application. Studies have demonstrated that UiV principles can enhance user experiences in product design by balancing complexity and coherence[13]. For example, in industrial design, elements such as color schemes, shapes and textures are often strategically varied to stimulate interest while maintaining a sense of overall unity. The increasing adoption of UiV in design practice reflects its transition from an abstract aesthetic theory to a practical design tool with measurable outcomes. Despite its growing application, the UiV principle remains under explored in certain domains, such as multi sensory design and tactile experiences. Furthermore, while many studies have focused on the visual and cognitive dimensions of UiV, less attention has been paid to its potential cultural and contextual variability. As UiV continues to be applied across disciplines, addressing these gaps will be critical for its broader theoretical and practical advancement.

Gestalt Principle: Gestalt theory is widely regarded as an important theoretical basis for explaining the unity in the Unity in Variety (UiV) principle. The theory originated from the field of psychology and emphasizes that individuals tend to automatically integrate scattered visual elements into a meaningful whole. Similar to the UiV principle, Gestalt theory is an explanation of the relationship between parts and the whole, which mainly reveals how people process visual information[14]. However, unlike the UiV principle, Gestalt theory is essentially a psychological theory. For visual information in the environment, our brain is constantly seeking to organize and construct incoming perceptual information and automatically group visual attributes into coherent elements[15]. At the same time, the proximity, similarity and continuity principles in Gestalt theory all reveal how human perception groups visual elements[16] and produces positive aesthetic effects[17]. Specifically, Gestalt theory describes how visual elements are grouped during perception, which in turn affects individuals' aesthetic evaluations. This also explains why people naturally integrate visual elements into wholes when observing objects. In recent years, Gestalt theory has been widely used in many design fields. For example, the application of Gestalt theory to landscape gardening can ensure that the arrangement of plant landscapes meets basic aesthetic needs[18]. In addition, in the field of interactive design, the aesthetic effect of the arrangement of interface elements also benefits from the application of Gestalt theory, that is, the visual combination of similar or related elements can improve the user's overall aesthetic experience and recognition efficiency[19,20]. However, Gestalt theory is essentially a set of psychological perceptual organization principles, not specifically designed for aesthetic experience. Therefore, the practice in specific fields such as design is mostly an extended application of the theory. In this case, the proposal of unity in the UiV principle clarifies the practical value of the theory in the field of aesthetics, making the value of Gestalt theory more concrete[21]. Studies have shown that overall organization and symmetry between elements have a more significant impact on aesthetic preference than geometric proportions or single visual factors[22]. This further explains that the overall effect of elements has a greater impact on aesthetic appreciation than the visual effect of individual elements[23]. Found that the symmetry of elements has a greater impact on aesthetic preference than the golden ratio. This means that compared with specific proportion parameters, the perceptual organization of elements plays a more important role in guiding aesthetic choices. These evidences highlight the important position of unity in the field of aesthetics and clarify the importance of Gestalt theory in the study of aesthetic appreciation. Nevertheless, the limitation of Gestalt theory is that it fails to clearly explain how variety affects aesthetics. Studies have pointed out that although unity has a stronger effect on aesthetic preference than variety, variety can also significantly enhance aesthetic experience under appropriate conditions[24,25]. However, variety usually relies on the existence of unity to play a positive role, while unity can

independently stimulate the generation of aesthetic pleasure[26]. Therefore, the interaction between unity and variety in the aesthetic pleasure still needs further empirical confirmation. Therefore, future research needs to further integrate Gestalt theory with other theories to more comprehensively understand the interactive mechanism and synergy between unity and variety in aesthetic experience.

Processing Fluency Theory: Although Gestalt theory provides a theoretical basis for the formation of unity in visual perception, it fails to fully explain the psychological mechanism of how unity directly promotes aesthetic pleasure. In order to further clarify the role of unity in aesthetic pleasure, research needs to clarify: How aesthetic pleasure should be judged. Aesthetic pleasure is usually understood as a kind of pleasure generated by sensory stimulation, but pleasure can be divided into many kinds, so it is difficult to clearly distinguish aesthetic pleasure from other positive feelings in the absence of a definition. In order to clarify the scope of aesthetic pleasure[27], Proposed the processing fluency theory. The theory holds that the pleasure of aesthetic stimulation can be determined by the perceptual fluency provided by the stimulation[28]. Processing fluency is used to describe the relative speed and difficulty of psychological operations occurring at the perceptual level[29]. Studies have shown that when the sensory characteristics of aesthetic objects stimulate the observer to produce a sense of fluency, aesthetic pleasure will also arise. This theory currently applies to visual simplicity, symmetry and similarity, which are all considered to be the source of fluency[30]. However, although the processing fluency theory has been proven to be feasible under many conditions, some studies have questioned its scope of application[31]. Found that the processing fluency theory cannot explain why people do not like extremely simple stimuli and even some people, such as art experts, tend to enjoy complex, novel rather than simple perceptual features[32]. This also makes it difficult for the theory to independently and completely explain the principle of the generation of aesthetic pleasure. But this does not mean that the theory lacks practical application value. Past research has focused on the overall exploration of the Project UAA project. Therefore[33], believes that highly prototype or highly typical objects or stimuli should in turn be cognitively processed more easily, saving cognitive resources and producing positive effects. In Hekkert's[34] research, this processing ease equivalent to happiness is also obvious. In the UiV principle, the unity in visual objects can produce a sense of fluency and the processing fluency theory just focuses on the relationship between fluency and aesthetic pleasure. Therefore, this theory provides a theoretical basis for the interpretation of the UiV principle, which helps to scientifically explain the process of aesthetic pleasure.

Arousal-Potential Theory: The principle that unity produces aesthetic pleasure has been confirmed, but variety is also believed to be able to stimulate aesthetic pleasure independently. According to[26], the human brain naturally tends to explore new information, so variety produces aesthetic pleasure, which is usually understood as a natural reaction of the brain. Reward learning theory explains in detail the entire reaction mechanism of the cerebral cortex triggering aesthetic appreciation[35]. However, this working mechanism from the nervous system has little to do with the aesthetic characteristics of design, so it is difficult to serve as a theoretical basis for variety. In order to explain this process more scientifically[36], Proposed the Arousal-potential theory to explain in detail how the variety of design stimulates aesthetic pleasure. The theory shows that novelty and complexity are the sources of arousal potential. Arousal potential can induce positive hedonic effects within a certain range, while excessive arousal potential will lead to negative reactions. Therefore, arousal potential and hedonic effects can be represented by the Wundt curve and the shape of the function is an inverted U shape. After decades of research, the theory can still be verified[37]. Found that factors such as novelty, complexity and uncertainty can provide arousal potential and appropriate arousal potential can induce hedonic effects. In addition, there are studies that show that arousal potential is obtained by adding complexity and novelty, so complexity and novelty are closely related to aesthetic preferences[38]. These studies not only verified the Arousal-potential theory, but also further explored the direct relationship between complexity novelty and aesthetic preferences. At the same time, researchers not only continue to explore the relationship between arousal potential and aesthetic preferences in theory, but also try to use this theory to contribute to the design industry in practice[39]. Tried to further clarify the relationship between novelty and complexity and aesthetic preferences in a quantitative way and finally obtained a framework and used this framework to generate any shape that can stimulate aesthetic preferences. These studies all indicate that the Arousal-potential theory is extremely scientific and reliable. It is not controversial under special conditions like the processing fluency theory. In the Arousal -potential theory, complexity can be reflected through the variety of elements, which also means that the

mechanism of variety generating aesthetic preferences can be used as a reference for this theory. However, there is still a lack of research that combines the Arousal-potential theory with the UiV principle. There are many explanations for the Arousal-potential theory, among which the explanation most closely related to variety is that the increase in the complexity of the stimulus will cause the organism to produce negative emotions with an exploratory impulse, thereby stimulating the organism to reduce the perceived uncertainty stimulus to a more easily processed mode and this exploration process and the result of successful information processing will induce the generation of pleasure[31]. Therefore, in the UiV principle, although variety is usually understood as the opposite of unity and relies on unity to produce aesthetic pleasure, it itself also has a mechanism to stimulate aesthetic pleasure and the Arousal-potential theory reasonably explains the principle behind this stimulation process, which also helps to further clarify the role of variety in the UiV principle. In summary, Gestalt theory, processing fluency theory and Arousal-potential theory explain the way in which unity and variety stimulate aesthetic pleasure respectively. This provides a theoretical basis for further understanding the mechanism of the UiV principle. Although few studies in the past have discussed the independent working principles of the two in combination with the UiV principle, the information conveyed by these theories is closely related to the UiV principle. Integrating and sorting them out will help to more comprehensively understand how unity and variety work together to promote aesthetic experience.

RESULTS AND DISCUSSIONS

The Relationship and Mechanism of Unity and Variety: The Unity in Variety (UiV) principle emphasizes that the dynamic balance between unity and variety is crucial to the generation of aesthetic pleasure. Aesthetic pleasure is usually defined as the positive emotions experienced by individuals through sensory interaction[34]. Unity and coherence are key features that promote aesthetic pleasure[26]. This phenomenon can be explained from a psychological perspective, that is, humans tend to organize visual elements into understandable wholes, and objects or interfaces that meet this condition are usually judged to have unity[40]. On this basis, many scholars have explored the mechanism of the influence of unity on aesthetic pleasure. At present, the research results on how unity promotes aesthetic pleasure are different. On the one hand, some studies point out that unity directly affects aesthetic pleasure by eliciting positive emotions[24]. Therefore, in this type of research, unity is usually regarded as a mediating variable between the aesthetic characteristics of products and aesthetic pleasure. On the other hand[41], Believed that unity promotes perceptual fluency and fluency itself is closely related to aesthetic pleasure[31]. Therefore, in the process of unity and aesthetic pleasure, other perceptual effects such as fluency are also involved. In addition, some scholars believe that unity can effectively reduce the difficulty of perceptual processing and thus improve aesthetic evaluation, which is regarded as the specific embodiment of Gestalt theory in the field of aesthetics[12]. These studies have different entry points in exploring the influencing mechanism and the research results obtained are also slightly different, but the similarity is that past studies have confirmed the positive impact of unity on aesthetic pleasure. However, the existence of positive effects alone cannot fully reveal the important value of unity to aesthetic pleasure. Therefore, in addition to verifying the relationship between unity and aesthetic pleasure in a direct way, the current study also explored this relationship from the opposite direction. They found that when unity is missing, aesthetic pleasure will also be significantly reduced. Brielmann and Dayan (2022) found that the lack of unity will cause people to be unable to understand what they see[42]. Stated that complex structures without order will make people psychologically difficult to accept and reduce the generation of aesthetic pleasure. These evidences further illustrate that unity has a huge influence on aesthetic pleasure. Although the positive impact of unity on aesthetic pleasure has been clarified, this promoting effect is not without limit. Studies have long shown that when an object reaches the ultimate unity, that is, when the elements, colors, sizes, etc. of each part can be seen as a whole, the viewer will become dull due to excessive perception of unity[43], thereby weakening the feeling of aesthetic pleasure. Therefore, in order to reduce this dullness and maintain stimulation, a large number of studies have begun to explore the value of variety, which is the opposite of unity, in aesthetic pleasure[1]. Found that variety has the effect of helping people avoid boredom because it challenges the senses and provides the potential to learn new information. The principle behind this is attributed to human habits. Since people are born with a natural tendency to explore and acquire new information, people's exploration of variety is usually based on an instinct[26,34]. Also believed that variety can produce aesthetic pleasure mainly because this perception has the prospect of learning. These studies have confirmed the positive value of variety to aesthetic pleasure by

revealing the stimulation process. However, variety cannot promote the generation of aesthetic pleasure without any restrictions. Similar to the characteristics of unity, too much or too little variety can also weaken the stimulation of aesthetic pleasure. On the one hand, if the object lacks variety, people will feel monotonous and lose interest[44]. On the other hand, too much variety will lead to confusion, disrupt our perception and cause confusion[1]. Therefore, using variety to neutralize the effect of unity also needs to achieve a moderate effect and not too much or too little. Under this condition, the opposition between the two also allows their effects on aesthetic pleasure to be linked together. Under the condition of joint action, unity and variety play different roles. When unity and variety are discussed together, researchers tend to focus on unity rather than variety. The main reason is that unity is regarded as the basis for people to understand objects. In other words, it provides structure for variety[1] and is a prerequisite for people to recognize variety. In contrast, variety creates confusion, which in turn leads to confusion and difficulty in understanding[26]. This also means that variety can only be appreciated when the senses can somehow organize different elements into a unified whole. At the same time, when the effects of unity and variety on aesthetic pleasure are compared horizontally, differences also exist[1]. Believes that unity is the dominant factor between the two and its effect on aesthetic pleasure is twice that of variety. This shows that unity is not only the basis for the effect of variety, but also plays a more critical role than variety in the mechanism of affecting aesthetic pleasure. However, from another perspective, variety also regulates the boredom brought by unity, thereby further strengthening the stimulation of aesthetic pleasure[45,41] as mentioned: Unity and variety are not opposites on a single dimension, but different dimensions that have a positive impact on aesthetics. Therefore, unity and variety are not simply opposite, but together constitute important dimensions of aesthetic pleasure. In summary, unity and variety are both independent and interdependent in the process of aesthetic appreciation. Unity directly enhances aesthetic pleasure by enhancing perceptual fluency and overall sense., variety indirectly strengthens aesthetic experience by providing novel stimulation. The proper balance between the two is crucial to achieving optimal aesthetic pleasure, which provides theoretical guidance and empirical basis for design practice.

Empirical Research on the UiV Principle: The Unity in Variety (UiV) principle reveals how the balance between unity and variety works together to optimize the aesthetic experience. Research shows that when unity and variety are balanced, objects will stimulate the senses to produce the best aesthetic pleasure[12]. However, the factors that affect this balance are complex, including visual elements such as symmetry, contrast, similarity and color characteristics[41] and tactile characteristics such as continuity, emergence and similarity[46]. In addition, motivational drivers (safety needs/achievement needs), product categories[13] and individual expertise also affect the realization of this balance[1]. The influence of many sensory variables also makes the effects of unity and variety in aesthetic pleasure more complicated. Empirical research has verified the effectiveness of the UiV principle in multiple product categories. First[13], Conducted an empirical study on the UiV principle for six products, namely lamps, espresso machines, car interiors, motorcycles, USB flash drives and tables and confirmed that the balance between variety and unity in these products can bring the best aesthetic pleasure. It was further concluded that optimizing the balance between unity and variety can significantly improve aesthetic preference[47]. Second, in the field of sustainable product design, the UiV principle also supports that the aesthetic appreciation of renewable materials is affected by visual and tactile consistency[48]. Third[15], confirmed that the appropriate combination of unity and variety in product form design, especially in the application of color, material and form, can effectively improve the overall aesthetic quality. In addition[24], Also confirmed that unity can significantly improve aesthetic pleasure in chair design. Although the UiV principle has been verified in many fields, existing research is still mainly limited to specific products or design categories, lacking empirical exploration of cross- category universality. In addition, there are significant differences in the way different products express unity and variety, which limits the general applicability of the UiV principle. Therefore, future research needs to further expand the scope of product categories to clarify the universal applicability conditions of unity and variety. However, current research mainly focuses on segmented product categories and almost no research can propose an exploration of the applicability of the UiV principle that is universally applicable to product design. In addition to relevant applications in the field of product design, the UiV principle has also been widely verified in interior design, cultural heritage design, interaction design, marketing and other art-related fields. First, in the field of interior design, the UiV principle reveals that the visual design of the workplace has a direct impact on the happiness of employees[49]. Secondly, in the field of traditional Chinese cultural design, the UiV

principle has also been shown to be applicable to the aesthetic appreciation of Chinese heritage buildings[50]. Next, in the field of interaction design, unity and variety can jointly explain the aesthetic pleasure generated by product interaction[51]. At the same time, the UiV principle has also been found to have an impact in other disciplines outside the field of art[52]. Found that the design principles of unity and variety have an impact on consumer purchasing psychology in the field of marketing. In addition, unity and variety have been shown to have a positive impact on aesthetic pleasure in music, poetry, images[4,11,5], landscape design[18], environmental design[53] and architectural design[54]. This shows that the current research scope of the UiV principle is very wide. However, in most fields, the UiV principle has only been proven to be applicable and influential. Although it has shown effectiveness, current research rarely provides specific aesthetic design guidelines on an empirical basis, which also provides an important direction for future research.

Multisensory Effects of the UiV Principle: As mentioned above, most of the current research on the UiV principle focuses on the field of visual aesthetics. However, other senses besides vision, such as touch, also have important aesthetic influences. Some studies have pointed out that vision and touch have similar perceptual organization mechanisms and neural bases[49]. This finding also provides a theoretical basis for these two senses to have similar mechanisms for producing aesthetic pleasure[55]. Found through the exploration of car key remote controls that unity and variety not only affect aesthetic appreciation at the visual level, but also can make people feel aesthetic pleasure at the tactile level[46]. Tested the tactile aesthetics in headphones and confirmed that unity and variety can stimulate aesthetic pleasure through touch. Although the results of empirical research also verify the value of unity and variety in tactile aesthetics, these verifications of tactile aesthetics further confirm the role of the UiV principle in aesthetics. However, the effects of unity and variety at the visual and tactile levels are not exactly the same. First, similar to the visual level, unity and variety also show an inherent negative relationship in tactile aesthetics and maximizing both will bring the highest aesthetic appreciation[55-60]. Second, unlike the visual level, unity and variety independently promote tactile aesthetic appreciation[25]. This also shows that the empirical research results at the visual level cannot be directly used to explain the phenomenon at the tactile level. In addition, the visual and tactile aesthetics of the same product will also have a mutual influence[48]. Found that the aesthetic appreciation of objects is affected by the inconsistency between tactile and visual qualities. This shows that the exploration of tactile aesthetics also ensures the effectiveness of visual aesthetic effects to a certain extent. Only when the tactile and visual qualities are consistent, the balance between the unity and variety of visual aesthetics a can maximize the perception of aesthetic pleasure. At present, empirical research in the field of tactile is relatively limited and the research object categories are relatively single. Although the UiV principle shows a significant aesthetic promotion effect in both visual and tactile design, empirical research is limited and the difference between visual and tactile mechanisms needs to be further explored. Therefore, future research urgently needs to further explore the UiV principles at the tactile level, as well as the exploration of other sensory aesthetics, in order to fully reveal the potential mechanisms and practical application value of multi-sensory aesthetics.

Model of the Mechanism of Unity and Variety on Aesthetic Pleasure: The Unity-Variety Aesthetic Pleasure framework (Fig. 1) proposed in this study intuitively demonstrates the mediating role of unity and variety between aesthetic characteristics and aesthetic pleasure. The mechanism by which the two produce aesthetic pleasure is clearly shown in the lower half of the figure. "+" represents a positive effect and "-" represents a negative effect. As mentioned above, the existence of only diverse aesthetic objects cannot be absolutely judged as not stimulating aesthetic pleasure. Therefore, this situation is shown in the figure as the lowest level of aesthetic pleasure, but not completely absent. This model reveals that although unity and variety are interdependent, they each have unique influence mechanisms and are not simp

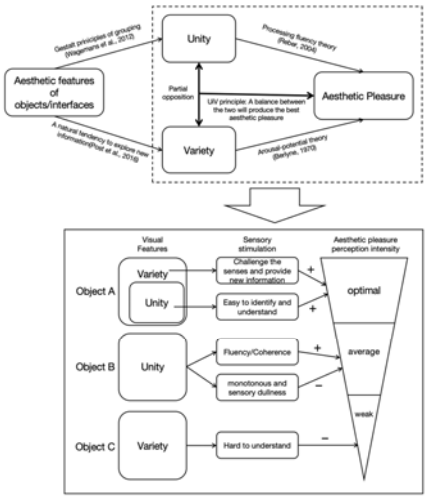

Fig. 1: Unity-Variety Aesthetic Pleasure Framework

(Fig. 1) Shows the mechanism of unity and variety on aesthetic pleasure (Unity-Variety Aesthetic Pleasure framework) and the specific content is explained as follows:

The Upper Part (in the Dotted Box): Aesthetic pleasure originates from the aesthetic characteristics of the object or interface, in which unity and variety have different theoretical foundations: First, unity is supported by the Gestalt principles of grouping and promotes aesthetic pleasure through the processing fluency theory. Second, variety originates from the natural tendency of individuals to explore new information and stimulates aesthetic pleasure through the Arousal-potential theory. Third, there is a certain opposition between unity and variety, but in the UiV principle, when the two are balanced, aesthetic pleasure can be maximized.

The Lower Part Shows How Unity and Variety Affect the Intensity of Aesthetic Pleasure Through Sensory Stimulation (Arranged from Strong to Weak, from Top to Bottom): First, object A has both unity and variety, which is easy to understand (Unity) and can provide novel sensory challenges (Variety) and has the strongest aesthetic pleasure (Optimal). Secondly, object B only has unity. Although it is easy to understand and produce a sense of fluency, it may reduce aesthetic pleasure due to being too monotonous, showing a medium level (Average). Thirdly, object C only has variety. It is difficult to understand due to lack of coherence and the aesthetic pleasure is the lowest (Weak). The Unity-Variety Aesthetic Pleasure framework theoretical model intuitively illustrates the important role and relationship between unity and variety in affecting aesthetic pleasure. The model emphasizes that the proper balance between unity and variety is the key to maximizing aesthetic experience. Specifically, neither unity nor variety alone can achieve the optimal state of aesthetic pleasure, while the combination of the two can achieve the optimal level of aesthetic feeling. Future design research should focus on exploring and clarifying the best form of this balance relationship in practical applications to better guide design practice. Through a systematic review of the literature, this study explored the unique mechanisms of unity and variety in the Unity in Variety (UiV) principle and their interrelationships. Unity mainly promotes aesthetic pleasure by improving the perceptual fluency of visual elements. According to the processing fluency theory, fluency is the source of aesthetic pleasure. However, the processing fluency theory is not applicable under all conditions, especially extremely simple visual stimuli may not meet people's needs for aesthetic complexity and novelty. For example, art experts enjoy the existence of complexity more. According to the UiV principle, objects with only unity will make people feel bored and it is the addition of elements that can reflect variety, such as complexity and novelty, that provides a hedonic effect, thereby reducing the observer's boredom and promoting aesthetic pleasure. This does not mean that processing fluency has no practical value. It provides a reliable theoretical basis for the independent influence of unity on aesthetic pleasure. Nevertheless, this does not negate the independent contribution of unity in aesthetic experience, but further supports the view proposed by the UiV principle that variety can supplement and enhance the aesthetic effect of unity under moderate conditions. Variety stimulates aesthetic interest by providing complex and novel information and this process is closely related to the psychological mechanism described by the Arousal-potential theory. According to the theory, the arousal level caused by appropriate novelty and complexity can enhance aesthetic preference, while excessive complexity may cause negative reactions. This theory is highly consistent with the negative impact of excessive variety proposed by the UiV principle, which further confirms the effectiveness of the Arousal-potential theory in explaining the mechanism of variety. It is worth noting that unity can independently promote aesthetic pleasure, while variety generally requires the structure and coherence provided by unity as a prerequisite to achieve the best effect. Because unity provides recognizability for objects/interfaces, people will only have positive emotions for objects that they can understand and if an object/interface only has variety but lacks unity, it will be difficult for users to recognize it and does not meet the basic conditions for generating aesthetic pleasure. However, although this theory has been widely accepted, there is still a lack of research that clearly shows that variety alone cannot provide aesthetic pleasure at all. However, in aesthetic pleasure studies that only focus on variety, variety has been proven to independently stimulate aesthetic pleasure by increasing the hedonic effect and this view needs further verification[3]. In view of this, future research needs to further explore the specific impact mechanism of variety on aesthetic experience under the condition of no obvious unity. In addition, a large number of empirical studies have verified the effectiveness of the UiV principle in stimulating aesthetic pleasure in design and non-design fields. However, current research is mainly focused on the field of product design and the research scope is limited. The exploration of this principle not only

focuses on vision, but also develops towards multi-sensory aesthetics. However, as a broad concept, the UiV principle has great differences in its definition and expression in different products and design scenarios. For example, the unity of interface design can be reflected in the consistent spacing between icons, but in product design such as umbrellas or refrigerators, the spacing of visual elements may not be the main aspect affecting unity. Therefore, future research needs to further clarify the applicability of the UiV principle in different design categories and promote the application of the UiV principle in actual design through more empirical research. In summary, this study clarifies the mechanism of action and interactive relationship between unity and variety and proposes future development directions, which will further improve the theoretical value and practical significance of the UiV principle.

CONCLUSION

This study systematically reviewed and analyzed the theoretical basis, mechanism of action and current empirical research status of the Unity in Variety (UiV) principle. By integrating Gestalt theory, processing fluency theory and Arousal-potential theory, the independent contributions and synergistic effects of unity and variety in promoting aesthetic pleasure were clarified. The study finally proposed a new theoretical model (Unity-Variety Aesthetic Pleasure framework) through a graphical model. The framework classifies and analyzes aesthetic objects, takes unity and variety as mediating variables and demonstrates their mechanism of action between visual characteristics, sensory stimulation and the intensity of aesthetic pleasure perception. Unity directly improves aesthetic pleasure by enhancing fluency and coherence, while variety indirectly enhances aesthetic experience by providing new information and complexity. The proper balance between the two is considered to be the key to producing optimal aesthetic pleasure. This model summarizes and reveals the mechanism of action and influence path between the two, which not only makes the complex mechanism of action of the UiV principle clearer, but also provides a good theoretical reference for further research on the UiV principle or empirical research in specific design fields in the future, helping researchers to understand the status and value of the UiV principle more clearly and quickly. Although a large number of studies have verified the effectiveness of the UiV principle in product design and other design fields, existing research is usually limited to specific products or specific fields, lacking systematic exploration across fields and multi-sensory dimensions. Future research needs to further expand the scope of empirical research and explore the applicability of the UiV principle in more product categories and sensory channels. The theoretical framework of this study provides a clearer structural framework for the UiV principle, which helps to explain the complex impact of unity and variety on aesthetic pleasure in different design contexts and provides a reference for constructing guidelines for empirical research and design practice in different design fields.

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