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Qiao QIAO, Yongzhi JIANG

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The Relationship between Aesthetic Cognition and Aesthetic Behaviour in University Students: The Mediating Role of Aesthetic Emotion

Qiao QIAO¹, Yongzhi JIANG²

Abstract

This paper discusses the relationships among aesthetic cognition, aesthetic emotion and college students' aesthetic behaviour in light of three questionnaires including an aesthetic cognition scale, an aesthetic emotion scale, and an aesthetic behaviour scale. A survey including these three structured scales was administered to 1060 university students at general undergraduate institutions. Their responses were scored on a 5-point Likert scale. Structural equation modelling was used to construct the measurement model and structural model. The survey results indicated positive correlations among these three variables. In addition, aesthetic emotion played a mediating role in the influence of aesthetic cognition on aesthetic behaviour. The results of this study can enhance the daily lives of college students by improving their levels of aesthetic and creative behaviour.

Keywords: aesthetic cognition; aesthetic emotion; aesthetic behaviour; mediating effect.

Introduction

The overall enhancement of students' aesthetic literacy is the aim of aesthetic education. Aesthetic literacy is reflected in aesthetic behaviour, which can reflect the aesthetic common sense and other aesthetic concepts that constitute an individual's aesthetic qualities concretely (Huang, 1991). Furthermore, more often than not, aesthetic behaviour involves an action in which the conscious and the unconscious are intertwined. The improvement of the individual's level of aesthetic behaviour is directly conducive to the development of aesthetic literacy as well as to the

¹ International College, Krirk University, Khet Bang Khen, Krung Thep Maha Nakhon, THAILAND. E-mail: 513047849@qq.com

² International College, Krirk University, Khet Bang Khen, Krung Thep Maha Nakhon, THAILAND. E-mail: psy_yongzhi@126.com (Corresponding author)

improvement of students' other core literacies. Previous research on aesthetic behaviour has focused on tourism (Zhang *et al.*, 2010; Liu *et al.*, 2020), but less research has focused on the aesthetic behaviour of university students; therefore, this study argues that it is necessary to explore the psychological factors that influence the aesthetic behaviour of university students. More recent research on the aestheticisation of life has argued that aesthetic behaviour should be reflected in everyday behaviour, that art should permeate life and that everyday behaviour should demonstrate beauty. Aesthetic behaviour is reflected in an individual's enthusiasm for expressing beauty and the individual's aptitude for creating and expressing beauty using various means and materials (Yi, 2018). This study holds that the daily aesthetic behaviour of college students includes three aspects: participating in artistic practice, appropriately matching clothing, and beautifying living space, which are similar to the aesthetic behaviour related to tourism, it is the communication and creative action between subject and object (Shitu *et al.*, 2011). Based on the aesthetic interaction between subject and object, it is of great significance to clarify the mechanism of college students' aesthetic behaviour for grasping the psychological characteristics and aesthetic quality of college students' aesthetic behaviour and promoting the reform of aesthetic education.

Literature review

The cognitive-affective-behaviour (CAB) model was first proposed by Holbrook to describe consumer behaviour, including all aspects from cognition to behaviour (Tan, 2022). Cognition refers to an individual's beliefs, perceptions and thoughts about an issue or object. Affect refers to the emotions or feelings that an individual has about an issue or object. Behaviour refers to the individual's behavioural intentions or actual actions. According to the cognitive-affective-behaviour model, decision making begins with cognition, followed by emotion, and ultimately results in behaviour. Cognition determines emotion, and emotion in turn leads to behaviour. More importantly, emotions regulate the relationship between cognition and behaviour. Based on this theory, this study constructs a model to examine the relationships among aesthetic cognition, aesthetic emotion and aesthetic behaviour. In this study, the acquisition and appreciation of aesthetic knowledge are identified as the cognitive response, the sense of natural, artistic and moral beauty is identified as the affective response, and university students' participation in art, dress matching and landscaping is identified as the behavioural response. Aesthetic knowledge and appreciation of art are important cognitive components of aesthetic literacy, and aesthetic affect measures the positive emotional responses of university students when they participate in artistic activities.

Graf and Landwehr (2015) proposed a dual processing model of fluency, the pleasure-interest model of aesthetic liking (PIA model), based on the fluency model of information processing. The pleasure-interest model of aesthetic liking

posits that the experience of aesthetic pleasure consists of aesthetic pleasure in the automatic processing stage and of aesthetic interest in the controlled processing stage of the aesthetic process. The individual feels the pleasurable experience of the aesthetic object in the primary stage of aesthetics, which is active and spontaneous and lacks the involvement of other media, while the advanced stage of the aesthetic interest process involves the experience of aesthetic pleasure that is encountered after the individual devotes attentional resources to the aesthetic object and processes it finely. Aesthetic interest refers to an experience of aesthetic pleasure that arises from the controlled processing stage, in which context the aesthetic object is processed finely. In the context of traditional Chinese aesthetics, Teng (1998) proposed the three levels of aesthetic sensory pleasure, aesthetic apprehension pleasure and aesthetic spiritual pleasure, and the traditional Chinese aesthetic perspective similarly divides aesthetic experience into three levels: “taste and image”, “view the qi” and “enlightenment”. In the context of “qi”, the subject obtains a deeper understanding of the vitality and deeper meaning of life, while “dao” refers to the highest and ultimate aesthetic experience. At the level of “enlightenment”, the subject’s spiritual world and the world of sensual experience become one, reaching the highest state of unity (Huang, 1998). Li (1989) classified human aesthetic experience in terms of what is “pleasing to the ears and eyes”, “pleasing to the heart and mind” and “pleasing to the mind and spirit”. Xuan and Zhou (2021) argued that beyond the ‘aesthetic pleasure’ and ‘controlled processing’ of ‘aesthetic interest’ highlighted by the PIA model, the notion of “aesthetic immersion” is also relevant. Neuroaesthetic studies have shown that the orbitofrontal cortex, which is responsible for pleasure and reward, is broadly activated during aesthetic processes (Mauss *et al.*, 2007; Mauss *et al.*, 2010; Matthew *et al.*, 2016; Ishizu & Zeki, 2011; Matthew *et al.*, 2017; Stefan *et al.*, 2018), and serves as the neural basis for the primary reward of aesthetic pleasure in the automatic processing stage, while different connections and functional roles in the striatal subcircuitry during aesthetics experiences are associated with the production of aesthetic pleasure in both stages (Blood & Zatorre, 2001; Galanter, 2010; Wald, 2015; Marianne *et al.*, 2017). Activation of brain areas associated with the default mode network (DMN) during peak aesthetic experience (Vessel *et al.*, 2012; Vartanian & Skov, 2014; Mas-Herrero *et al.*, 2018). Researchers have suggested that when professional performers enjoy music that they love, they become engrossed not only in the melodic beauty of the music itself but also in a life experience of themselves and the music, leading to an experience of a pure aesthetic peak that allows the individual to experience free, spontaneous and passionate aesthetic pleasure (Limb & Braun, 2008; Gold *et al.*, 2019). The activation of the default mode network and the deactivation of the lateral prefrontal cortex during the peak hours of aesthetic experience suggest that the power and self-improvement that individuals obtain when they appreciate art during this moment belongs to a spiritual pleasure. At this time, the activity of the lateral prefrontal lobe is reduced, and the default mode network is activated, which entails

that the control of reason is drastically reduced and the inner self is completely opened up, thus causing the individual to enter a state of “swimming” without self, without time and without space.

The development of aesthetic cognition plays an important role in the formation and development of the entire aesthetic psyche. According to cognitive-emotional theory, the influence of aesthetic cognitive processing on aesthetic experience ranges from the lower level of aesthetic perception to the higher level of aesthetic understanding and aesthetic evaluation. The level of processing of aesthetic cognition determines the level of the corresponding aesthetic experience. Multilevel theory also suggests that ‘aesthetic experience can occur in the absence of conscious aesthetic cognition. However, when it does not involve conscious aesthetic processing it usually occurs prior to the aesthetic experience’ (Ledoux, 1996; Power & Dalgleish, 1997). The successful completion of each stage of the aesthetic process triggers a self-rewarding experience and continually changes the overall level of the subject’s aesthetic affect.

Aesthetic objects have certain stimulating properties, and individuals gain aesthetic pleasure through the appreciation of nature, art and other human works (Packard & Berlyne, 1974; Armstrong & Detweiler-Bedell, 2008). Huang & Zheng, (2015) argued that beauty is a pleasurable experience, Chen *et al.*, (2013) argued that the physiological response to the experience of beauty is similar to positive emotions (, and Ramachandran and Hirstein (1999) argued that beauty is a product of the rewarding properties of perceptual stimuli and that the visual system (or a higher perceptual system) is activated when processing a feature., Vartanian and Goel (2004) found that multiple brain regions that are responsible for emotion and reward were activated during aesthetic experiences when subjects judged aesthetic tendencies. Fairhall and Ishai (2008) used paintings as material to study the effects of recognition and recall on aesthetic judgements, and they observed that the brain’s emotion and reward systems were also automatically activated even when subjects did not make aesthetic evaluations. Galanter (2010) argued that the effective processing of complex information is rewarding and that aesthetic pleasure is the result of the action of the reward system. Aesthetic pleasure is the pleasure associated with being ‘moved by [the] knowledge’ of an aesthetic object and is a peak experience of aesthetic forgetfulness and mindfulness (Chatterjee & Vartanian, 2016; McKeown, 2013).

The information processing model further proposes that aesthetic experience consists of five stages, perception, intuitive categorisation, implicit categorisation, cognitive control and cognitive evaluation (Leder *et al.*, 2004), and this model clearly divides the aesthetic process into two distinct components: aesthetic emotion and aesthetic judgement. Assuming that cognition (aesthetic judgement) and affective experience are interconnected and that if, by chance, one successfully apprehends a work of art (something that embodies beauty) and experiences aesthetically positive emotions, then aesthetic activity can become an instinctive motivation. Driven by this motivation, people continue to seek aesthetic experiences, which

in turn offer them pleasure and inspire emotions, thus forming a virtuous circle; simultaneously, this process provides a source of motivation that encourages people to seek pleasure (positive emotions) through aesthetic activities. Accordingly, aesthetic experiences are sufficient to help people seek to experience constant feelings of pleasure and happiness. The aesthetic cognition of university students directly and positively predicts their aesthetic emotion, and Xu Zhen's study reports a significant positive correlation between university students' aesthetic cognitive ability and their level of aesthetic emotional experience (Xu, 2007).

The fundamental role of aesthetic cognition in the production of aesthetic experience can also be seen in the aesthetic process, which is a gradual and dynamic process. Aesthetic experience can be divided into many levels, and the higher the level is, the more subjective it the experience becomes. There is therefore no doubt about the important role of aesthetic understanding in aesthetics, which refers to the process of grasping the meaning of an aesthetic object in light of one's aesthetic perceptions combined with one's previous knowledge and experience.

Temme (1992) explored the influence of an individual's aesthetic knowledge on his or her aesthetic experience in a museum setting, in which context the amount of information an individual has about an artwork impacts his or her aesthetic experience by experiencing beauty in this setting. An individual can have a more aesthetically pleasing experience if he or she has background information about the artist and a certain amount of cultural knowledge; furthermore, such knowledge can improve an individual's aesthetic evaluation of the work in question. Millis (2001) demonstrated that information on the title of such a work can have an impact on aesthetic evaluation, and after the researcher added information on the title, the subjects' aesthetic evaluation of the work increased. Aesthetic understanding is the process of grasping the meaning of an aesthetic object based on one's aesthetic perceptions combined with one's previous knowledge and experience. Individuals who have a deeper understanding of the meaning of a work exhibit smooth aesthetic cognitive processing and are also able to experience pleasant emotions and make positive evaluations during the aesthetic experience. Russell (2003) also found that when people's ability to explain the meaning of a work increased, their evaluation of the work's pleasantness also increased. The experimental results of scholars such as Leder (2006) indicate that subjects' mastery of knowledge related to works can enhance their positive emotions. Scholars such as Lenger (2007) have found that individuals who understand the style information of art works can increase their understanding of painting works and art style knowledge, which can help viewers classify their works and facilitate the smooth processing of aesthetic cognition.

The more aesthetic knowledge and domain-specific knowledge an individual has during an aesthetic activity, the more pleasure he or she can experience during the aesthetic activity, which can increase the positive emotions of the aesthetic subject and influence the individual's aesthetic judgement. The more aesthetic knowledge an individual has in the process of appreciation, the better his or her

ability to classify and generalise aesthetic objects within a style that can be linked to previous experiences through aesthetic cognitive processing, thus allowing for smooth aesthetic processing. Thus, this study's first primary hypothesis was as follows:

H1: The aesthetic cognition of university students has a significant positive impact on their aesthetic emotions.

Aesthetics is a free (compliance) and conscious (purposeful) practical activity. People are constantly engaged in aesthetic activities in their lives, and can be seen everywhere in nature, social life and artistic activities, appreciating beautiful scenes, expressing beautiful things or creating beautiful futures. Aesthetic needs are the intrinsic motivation for aesthetic behaviour. According to Maslow (Xu, 1987), when one of the individual's basic needs is satisfied, another "higher" need comes to predominate. Maslow considers self-actualisation to be a 'no need' since the term 'need' in its ordinary sense refers to the organism's dependence on external conditions that are indispensable for the continuation and development of its life. Self-realisation' is the result of freedom from this conditioned dependence. Self-realisation is not something external to the organism that it needs to promote its own well-being but rather an internal growth that already exists within the organism, or more precisely, within the organism itself; thus, Maslow views aesthetic needs as representing the higher needs of the individual, second only to the individual's need for self-fulfilment.

In 1996, the meta-analysis conducted by Eisenberger and Cameron showed that any dampening effect of rewards on internal motivation could be avoided and that rewards could promote creative behaviour, which refers to the individual's engagement in an activity for the sake of the pleasure and satisfaction associated with the activity itself (Ryan & Deci, 2000).

A number of studies conducted by Amabile have shown that individuals with high levels of internal motivation are more involved in completing tasks, exert more cognitive effort and are less exposed to external conditions; they therefore perform better in terms of creativity (Amabile, 1979; Amabile, 1985; Hennessey & Amabile, 1998; Schultz *et al.*, 2000) feelings-as-information theory suggests that positive emotions are an important factor in the processing of creative tasks. Positive emotions indicate a comforting state of mind, which encourages people to adopt a more relaxed approach to finding new things and reorganising their thoughts (Watson *et al.*, 1988). Positive and negative emotions are not two endpoints in the same dimension; rather, they are two components that are separate from each other. An important notion in this context is the pleasurable feeling that an individual experiences when achieving a goal and gaining the approval of others (Lazarus, 1991).

Such pleasure enhances the individual's motivation and vitality, making the expression of the individual's behaviour more active (Meng, 1989). This pleasure

satisfies the individual, which in turn helps the individual to succeed in his or her actions, and positive emotion is a feeling of pleasure that satisfies the individual and inspires positive action (Cabanac, 2002).

Numerous empirical studies have shown that employees' creative abilities are enhanced by positive affect (Lyubomirsky *et al.*, 2005; Zhou & Shalley, 2008). Positive emotions can facilitate individuals' cognitive and motivational processes, which in turn promote their creativity (Hirt *et al.*, 1997). Isen (1999) noted that after people experience positive emotions, they find more connections among different things, discover more similarities and differences among things, and thus exhibit more creativity. Vosburg (1998) and others have reported a significant positive relationship between the individual's positive emotions and his or her performance in completing a creative experimental task.

The extended-constructive theory of positive emotions suggests that positive emotions expand an individual's cognitive range, increase the number of cognitive resources available to the individual for making connections, distract attention from more complex situations, and increase the breadth of relevant resources available for problem solving. This process causes more effective information to become available to the individual to solve problems (Fredrickson, 2001). By expanding the range of available resources, the behavioural guidance system is altered, and individuals are motivated to seek new and creative ways of thinking and acting, thus establishing a positive 'emotion-cognition-behaviour' spiral (Baas *et al.*, 2008). Empirical research has shown that positive emotions have a more significant effect on creativity than negative emotions and neutral emotions and those positive emotions, whether spontaneous or induced, can lead to more creativity and flexibility in terms of thinking and acting (Zhang *et al.*, 2017).

Kreitler & Kreitler (1972) argued that the affective state associated with aesthetic experience is an immersive experience, a very strong, positive emotional-emotional state. It can drive strong, intrinsic, instinctive motivation, and when driven by intrinsic motivation, the individual feels a strong sense of interest and adaptation during aesthetic activities and may forget about both time and self. Attribution theory suggests that people who exhibit positive affect are more likely to attribute their failures to the external environment (Kanungo, 1982). This attribution can also help individuals maintain a higher level of creative efficacy, resulting in greater confidence in their subsequently creative endeavours and a better ability to reverse their previous creative failures. As a result, individuals with high levels of aesthetic emotion are actively involved in artistic activities and are active and more engaged in aesthetic activities; accordingly, their positive emotions lead them to engage in creative behaviour, and they thus exhibit higher levels of creativity. In summary, this research proposes hypothesis H2 as follows:

H2: The aesthetic emotions of university students have a significant positive impact on their aesthetic behaviour.

The aesthetic emotions of university students have a mediating effect on the relationship between their aesthetic cognition and aesthetic behaviour

In artistic experiences, individuals simulate the mental or emotional conditions of others by using their own sensory-motor systems to elicit emotional resonance (Freedberg & Gallese, 2007). Goldstein (2011) found that after a year of artistic training for subjects, the subjects' level of empathy increased significantly, and they were able to be imbued with aesthetic activities. Christensen and Calvomerino (2013) found that individuals can develop emotional empathy when watching a dance performance by appreciating the changes in the dancer's facial expressions and the meaning conveyed by the dancer's body gestures. Sevdalis and Raab (2014) examined the relationships among art performance, empathy and pro-social behaviour. Art performances or other aesthetic interactions require the transmission of emotions to be emotive, aesthetic activities that cannot be separated from aesthetic emotions, and there are certain connections among aesthetic emotions, empathy and pro-social behaviour. Arnold *et al.* (2014) showed that learning in art gallery contexts enhances young people's 'empathy' and 'understanding', which in turn affect their comprehension and empathy. In neurophysiological terms, Cela-Conde *et al.* (2009) reported significant changes in empathy-related brain areas (right angular gyrus and parietal cortex) when subjects made aesthetic evaluations of pictures such as landscapes and paintings. Close relationships among aesthetic emotion, empathy and pro-social behaviour were found through a review of previous studies. Aesthetic activities mobilise sensation, perception and movement, thereby enhancing the individual's cognitive and interpersonal level. The cognition-performance relationship formed during the aesthetic process promotes empathy, which is an important factor that influences pro-social behaviour. Millis (2001) found that aesthetic training influenced people's emotional responses to art and that growing aesthetic experiences led people to pay more attention to their make-up, clothing, etc., and to focus on the beauty of things, which in turn had impacts on their behaviour. The studies mentioned above suggest that the positive impact of art education on individual aesthetic behaviour must be mediated through aesthetic emotions.

Similarly, domestic researchers have found that the aesthetic emotions experienced by the subject during aesthetic activities can promote good behaviour. Tan (1997) argued that aesthetic emotional experiences can have a beneficial impact on an individual's moral learning and contribute to the overall harmonious development of his or her personality. Chen (2010) considered aesthetic emotions to be a category of positive emotions. Wang (2016) demonstrated that aesthetic emotions promote the development of pro-social behaviour in individuals. Based on an aesthetically pleasant experience, subjects can also establish a good and harmonious relationship between themselves and the outside world, making it easier for people to appreciate things in the outside world and enabling them to understand others more easily and to coexist with the people or environment around them more effectively. Studies have shown that subjects with positive emotions

engage in more altruistic behaviour than those who are depressed (Krueger *et al.*, 2001).

Aesthetic cognition and aesthetic emotion are key factors in aesthetic activity, and they are inseparable from each other. Aesthetic education differs from other types of education in that it is a form of emotional and affective education, and the process of aesthetics entails both an exchange of knowledge and a transfer of emotion. Simultaneously, aesthetic emotions are positive emotions and pleasant emotions that play a key role in promoting aesthetic behaviour. With regard to the positive emotions that university students feel towards aesthetic objects, the ability of university students to feel such emotions towards natural landscapes, artworks and moral behaviours, the formation of positive emotions depends on the knowledge, appreciation and performance abilities acquired by university students who participate in the aesthetic process, and aesthetic cognition impacts the intention of university students to engage in aesthetic behaviour through their aesthetic emotions.

Accordingly, this study proposes H3: The aesthetic emotions of university students have a mediating effect on the relationship between their aesthetic cognition and aesthetic behaviour.

Methodology

Participants

From 1 July 2022 to 8 July 2022, the questionnaire was distributed via a web-based platform using Questionnaire Star software. The survey received a total of 1132 responses, of which 72 invalid responses were removed, resulting in 1060 valid responses, for a recovery rate of 93.6%. The questionnaire was sourced mainly from a number of universities in Xi'an. The 1060 official responses to this study were investigated with regard to the 2 background variables of gender and discipline. The results showed that in terms of gender, the respondents included 589 male students (55.6% of the sample) and 471 female students (44.4% of the sample); in terms of discipline, the respondents included 422 arts students (39.8% of the sample) and 638 science students (60.2% of the sample). These findings indicate that in this sample, the ratio of male to female students was more equal, but the number of students from disciplines in the sciences was higher than the number of students from disciplines in the arts.

Materials

The questions included in the aesthetic cognition, aesthetic emotion and aesthetic behaviour scales were all measured on a five-point Likert scale with

a positive scoring format ranging from strongly disagree (scoring 1) to strongly agree (scoring 5).

Aesthetic cognition. The aesthetic cognition scale developed by Wu (2017) was used in this research. This scale consists of 11 questions divided into 2 dimensions, including 6 questions on aesthetic knowledge and 5 questions on appreciation and expression. A sample item is “I use at least one medium of visual art (watercolour, ink, oil, clay, stone, technological materials, etc.) and the appropriate techniques”. In terms of internal consistency and reliability, the Cronbach’s alpha coefficient of the aesthetic cognition scale was 0.91.

Aesthetic Emotion. The aesthetic emotion scale developed by Diessner *et al.* (2008) was used after making appropriate deletions and modifications to the original questions. The aesthetic emotion scale consists of 10 questions divided into 2 dimensions, including 3 questions on natural beauty and 7 questions on human beauty. An example item is “When the subject perceives beauty, he or she feels a lump in the throat, a heaving of the chest and other physiological reactions”. In terms of internal consistency and reliability, Cronbach’s alpha coefficient for the aesthetic emotion scale is 0.93.

Aesthetic behaviour. The article divides aesthetic behaviour into three dimensions: the behavioural habit of participating in art, the beautification of the living environment, and the reasonable matching of clothing. This research adopts and refers to the aesthetic behaviour scale designed by Wu (2017) and Yi (2018), in which context the dimension of participation in art refers to Wu (2017), and the dimensions of beautification of environment and clothing matching refer to Yi Xiaoming. The aesthetic behaviour scale included in this study contains a total of 11 questions divided into 3 dimensions: 4 questions on the behavioural habits of participating in art, 4 questions on the beautification of the living environment and 3 questions on the reasonable matching of clothing. An example item is “I often visit art exhibitions (painting, heritage, music, dance, theatre)”. The Cronbach’s alpha coefficient for the aesthetic behaviour scale is 0.91.

Confidence and validity analysis

The results of the validated factor analysis of aesthetic cognition showed that the model fit the data well, such as χ^2/df was 2.757, RMR was 0.016, RMSEA was 0.041, AGFI was 0.969, NFI was 0.989, TLI was 0.988, CFI was 0.993, IFI was 0.993, and RFI was 981, the standardised factor loadings for the aesthetic knowledge, art appreciation and skills dimensions of the aesthetic cognition scale ranged from 0.750 to 0.900 and from 0.610 to 0.821, respectively. The combined reliability of the constructs included in the aesthetic cognition scale constructs were 0.915 and 0.828, respectively, and the average variance extracted (AVE) values were 0.642 and 0.493, respectively; in addition, the Cronbach’s alpha

coefficient for the aesthetic cognition scale was 0.914, the Cronbach's alpha coefficient for the construct aesthetic knowledge was 0.928, and the Cronbach's alpha coefficient for appreciation and skills was 0.853.

The results of the validated factor analysis of aesthetic emotions showed that the model fit the data well, as χ^2/df was 5.997, RMR was 0.019, RMSEA was 0.069, AGFI was 0.940, NFI was 0.981, TLI was 0.971, CFI was 0.984, IFI was 0.984, RFI was 0.965, PNFI was 0.545 and PCFI was 0.547. The standardised factor loadings for each dimension of the aesthetic emotion scale ranged from 0.789 to 0.890 and from 0.632 to 0.816 for natural and humanistic (artistic and moral) aesthetics, respectively. The combined reliability of the aesthetic emotion scale constructs were 0.882 and 0.902, with AVEs of 0.715 and 0.570, respectively. The Cronbach's alpha coefficient for the aesthetic emotion scale was 0.933, the Cronbach's alpha coefficient for the construct natural beauty was 0.890, and the Cronbach's alpha coefficient for the construct humanistic beauty was 0.918.

The results of the validation factor analysis of aesthetic behaviour showed that the model fit the data well, as χ^2/df was 3.707, RMR was 0.018, RMSEA was 0.051, AGFI was 0.960, NFI was 0.979, TLI was 0.977, CFI was 0.985, IFI was 0.985, and RFI was 0.968. The standardised factor loadings for the Aesthetic Behaviour scale ranged from 0.713 to 0.818, from 0.679 to 0.788 and from 0.693 to 0.845 for the artistic participation, environmental amenity and dress code dimensions, respectively, all of which were significant. The overall Cronbach's alpha coefficient for the aesthetic behaviour scale was 0.91; the Cronbach's alpha coefficients for the constructs artistic involvement, environmental beautification, and dress code were 0.846, 0.823, and 0.836, respectively, and the AVE were 0.580, 0.539, and 0.630, respectively. Cronbach's α values were 0.865, 0.843, and 0.828, respectively.

The data were analysed descriptively using SPSS 23.0 software, and the optimal model was tested for mediating effects using the bootstrap method with the support of AMOS 24.0 software.

Common method deviation test

In this study, after the questionnaires were collected, collated and tested using Harman's one-way method, all the variables measured were included in one exploratory item for analysis, and a total of seven principal components were extracted before factor rotation. The first factor explained 40.17% of the variance, which was less than 50%, thus indicating that these data had no problem with common method bias and could thus be analysed in depth (Tang & Wen, 2020).

Results

Descriptive analysis

Table 1 presents the results of the descriptive statistics and correlation analyses for each variable, which indicate that the current aesthetic cognition, aesthetic emotions and aesthetic behaviour of the university students tested are at a moderate to high level. The results found significant positive correlations among the variables of aesthetic cognition, aesthetic emotion and aesthetic behaviour, and the data from this study can thus be used for further mediating effect analysis.

Table 1. Summary table of the overall correlation analysis between aesthetic cognition, aesthetic emotion and aesthetic behaviour

Variables	<i>M</i>	<i>SD</i>	1	2	3
1.Aesthetic cognition	3.28	0.69	1		
2.Aesthetic emotion	3.62	0.70	0.61**	1	
3.Aesthetic behaviour	3.46	0.64	0.64**	0.66**	1

Main effect

Table 2 presents the regression analysis among the variables, which shows that after controlling for the effects of gender and discipline, aesthetic cognition directly and positively predicted aesthetic emotion ($\beta=0.60, p<0.001$), aesthetic cognition directly and positively predicted aesthetic behaviour ($\beta=0.63, p<0.001$), and aesthetic emotion directly and positively predicted aesthetic behaviour ($\beta=0.65, p<0.001$). When aesthetic cognition and aesthetic emotion simultaneously predicted aesthetic behaviour, aesthetic cognition had a direct positive predictive effect on aesthetic behaviour ($\beta=0.38, p<0.001$), and aesthetic emotion had a direct positive predictive effect on aesthetic behaviour ($\beta=0.42, p<0.001$).

Structural model

The fit indicators of the model for measuring the mediating role of aesthetic emotion showed that two indicators, χ^2/df and RMSEA, did not meet the appropriate standard; thus, the correlation path between the residual terms was added. Through continuous correction, a model was ultimately obtained that featured excellent compliance with respect to each fit indicator, for example, 6.31 for χ^2/df , 0.01 for RMR, 0.07 for RMSEA, 0.97 for TLI, 0.99 for NFI, 0.95 for AGFI and 0.99 for CFI (Bentler & Chou, 1987; Hair *et al.*, 1998; Schumacker & Lomax, 2004).

Table 2. Regression analysis between variables

Regression equation		Overall fit index			Significance of regression coefficients	
Resulting variables	Predictor variables	R	R ²	F	β	t
Aesthetic emotion	Gender	0.62	0.38	215.52	0.07	2.75**
	Subjects				-0.04	-1.59
	Aesthetic cognition				0.60	24.78***
Aesthetic behaviour	Gender	0.65	0.42	253.84	0.06	2.20*
	Subjects				-0.06	-2.28*
	Aesthetic cognition				0.63	26.87***
Aesthetic behaviour	Gender	0.66	0.43	270.02	0.00	0.02
	Subjects				-0.06	-2.43*
	Aesthetic emotion				0.65	27.74***
Aesthetic behaviour	Gender	0.73	0.53	292.53	0.03	1.13
	Subjects				-0.04	-1.77
	Aesthetic cognition				0.38	14.29***
	Aesthetic emotion				0.42	15.42***

Mediating effects

This paper uses the bootstrap method with 2000 resamples to calculate confidence intervals at the 95% level of bias correction and to test the significance of the mediating effect (MacKinnon, 2008). The specific results are shown in Table 3, in which context the test results indicate that the 95% confidence interval [0.65, 0.80] for the total effect (0.73) does not contain 0, thus indicating a significant total effect of aesthetic cognition on aesthetic behaviour. The direct effect (0.34) 95% confidence interval [0.19, 0.47] does not contain 0, thus indicating a significant direct effect of aesthetic cognition on aesthetic behaviour. The total indirect effect (0.39) 95% confidence interval [0.29, 0.52] does not contain 0, thus indicating a significant indirect effect of aesthetic cognition on aesthetic behaviour, with a partially mediating effect of aesthetic emotion. In summary, the total, direct and indirect effects of aesthetic cognition on aesthetic behaviour are significant, and aesthetic emotion has a partially mediating effect on the relationship between

aesthetic cognition and aesthetic behaviour. Therefore, Hypothesis 4 is confirmed; the specific path is shown in Figure 1.

Table 3. Bootstrap Method Estimates 95% Confidence Interval

Total, Direct, and Indirect effect	Path	Path Coefficient	BC(Bias-Corrected)	
			Lower	Upper
Total effect	Aesthetic cognition →Aesthetic behaviour	0.73***	0.65	0.79
Direct effect	Aesthetic cognition →Aesthetic emotion	0.76***	0.69	0.83
	Aesthetic emotion →Aesthetic behaviour	0.51***	0.37	0.65
	Aesthetic cognition →Aesthetic behaviour	0.34***	0.19	0.47
Indirect effect	Aesthetic cognition →Aesthetic behaviour	0.39***	0.29	0.52

*** $p < .001$.

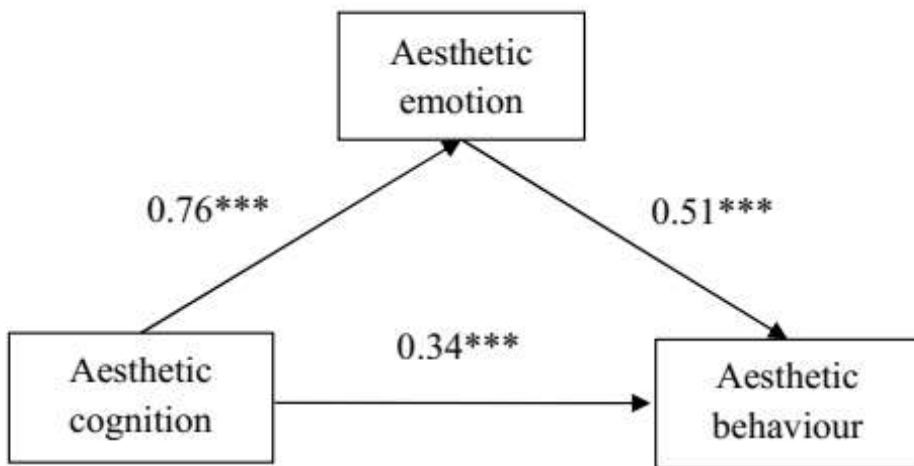


Figure 1. Structural Model

Discussion

The results of this study indicate that university students' aesthetic cognition have a significant positive effect on their aesthetic emotions, the higher the level of university students' aesthetic cognition is, the higher the level of aesthetic emotions they exhibit. Thus, Hypothesis 1 of this study is confirmed.

These findings are consistent with cognitive-emotional theory, according to which the level of processing of aesthetic cognition determines the hierarchical level of aesthetic experience (Ledoux, 1996; Power & Dalglish, 1997), and the findings are also consistent with the conclusions drawn by Xu (2007). The importance of aesthetic understanding to the aesthetic experience is undeniable, as the successful completion of each stage of the aesthetic process triggers a self-rewarding emotional experience and continuously increases the subject's overall level of aesthetic emotions; accordingly, the results of the study are consistent with the findings of scholars (Temme, 1992; Millis, 2001; Russell, 2003; Leder *et al.*, 2006; Lengger *et al.*, 2007).

The results of the study show that university students' aesthetic emotions have a significant positive influence on their aesthetic behaviour, the higher the level of university students' aesthetic emotions is, the higher the level of aesthetic behaviour they exhibit. Thus, Hypothesis 2 of this study is confirmed.

A successful aesthetic cognitive process activates the reward system, which in turn triggers aesthetic pleasure, and the activation of the brain's reward centres by the artwork becomes the driving force underlying the aesthetic behaviour.

Echoing previous scholarly research (Amabile, 1979; Amabile, 1985; Hennessey & Amabile, 1998), individuals with high levels of internal motivation are more involved in completing tasks, exert more cognitive effort, and perform better in terms of creativity. The conclusion is in line with (Schultz *et al.*, 2000) feelings-as-information theory, according to which positive emotions are an important factor influencing the processing of innovative tasks. Positive emotions indicate a comfortable state of mind (Meng, 1989; Cabanac, 2002), which allows people to take a more relaxed approach to finding new things and reorganising their thoughts (Isen, 1999). Positive emotions can facilitate the cognitive and motivational processes of individuals and promote their creativity (Lyubomirsky *et al.*, 2005; Zhou & Shalley, 2008; Vosburg, 1998).

These conclusions are consistent with the extended-constructivity theory of positive emotions (Fredrickson, 2001). Positive emotions play a more significant role in creativity (Baas *et al.*, 2008; Zhang *et al.*, 2017). Attribution theory suggests that people who experience positive emotions are more likely to attribute their failures to external circumstances (Kanungo, 1982), and this attribution can also help individuals maintain higher levels of creative efficacy.

The results of this study indicate that aesthetic emotion has a partially mediating effect on the relationship between aesthetic cognition and aesthetic behaviour.

This finding suggests that aesthetic cognition not only contributes to the level of aesthetic practice exhibited by university students but also enhances their level of aesthetic practice through aesthetic emotion. Thus, hypothesis 3 of this study is confirmed.

The findings are also consistent with the cognitive-affective-behaviour (CAB) model (Tan, 2022). Cognitive processing is fundamental to the production of positive, pleasurable feelings and to the satisfaction of people's needs. From this perspective, the perception of beauty is the basis for the production of pleasurable feelings and the satisfaction of aesthetic needs. Maslow's 'peak experience' theory classifies people's aesthetic needs as higher needs associated with a path towards 'self-realisation', which transforms people's 'inner potential' into reality. The important effect of professional knowledge in the processing of aesthetic cognition, aesthetic knowledge, connoisseurship and professional skills can significantly improve and enhance their aesthetic cognitive mastery, aesthetic pleasure and aesthetic evaluation. The more aesthetic knowledge and domain-specific knowledge an individual has, the more pleasure he or she can experience in the context of aesthetic activities and the more positive emotions the aesthetic subject can feel. The cognitive process is the basis for the generation of positive and pleasurable feelings and for the satisfaction of one's needs. In this sense, the aesthetic cognitive process is the basis for generating aesthetic feelings and for satisfying aesthetic needs. Aesthetic experience is a major component of peak experience, which Maslow viewed as an important pathway towards self-actualisation that is associated with the process of turning one's inner potential into reality. Aesthetic cognition and aesthetic emotion are key factors in aesthetic activities, and they interact with each other and cannot be separated. Aesthetic education differs from other types of education in that it focuses on education in emotion and sentiment; thus, the process of aesthetics is not merely an exchange of knowledge but also a transfer of emotion. The formation of positive emotions depends on the knowledge, appreciation and expression ability acquired by students in the process of aesthetics, and aesthetic cognition acts on students' intention to engage in aesthetic behaviour through aesthetic emotion.

Individuals simulate the mental or emotional conditions of others through their own sensory-motor systems to elicit emotional resonance (Freedberg & Gallese, 2007; Goldstein, 2011; Christensen & Calvomerino, 2013; Sevdalis & Raab, 2014; Arnold *et al.*, 2014), and the increasing aesthetic experience causes people to pay more attention to their make-up, clothing, etc., and to focus on the beauty of things, which in turn has an impact on their behaviour (Millis, 2001).

The interaction between cognition and positive emotions drives people to pursue aesthetic experiences constantly, which in turn lead to deeper positive emotional experiences. Such positive emotional experiences are the driving force underlying aesthetic behaviour, and positive emotions can facilitate the smooth development of aesthetic creative behaviour. Thus, aesthetics can offer people a pleasurable experience while promoting their aesthetic behaviour.

Conclusion

The aesthetic cognition (including aesthetic knowledge, appreciation and expression) of university students promotes the generation of positive emotions associated with aesthetics. Under the influence of aesthetic common sense, the level of emotion that university students experience with regard to natural landscapes as well as human beauty increases. In addition, positive emotions motivate them to continue to engage in the act of creating beauty. This increase in aesthetic cognitive ability drives the enrichment of aesthetic emotions. Individuals are prompted to use their general knowledge of aesthetics and art theories to improve themselves and beautify their spaces, to increase the frequency with which they engage in artistic habits and their willingness to do so and to express themselves in their daily lives.

Students currently perform well in terms of their aesthetic behaviour, and their level of aesthetic cognition and aesthetic emotion are both in the medium to high range. Furthermore, aesthetic cognition and aesthetic emotion play key roles in promoting the enhancement of aesthetic practice behaviour among students, who develop rich, positive emotions that can contribute to their ability to create and express art. In addition, this study reveals that the aesthetic emotions that occur during the aesthetic process experienced by university students play an important mediating role in the relationship between aesthetic cognition and aesthetic behaviour and that aesthetic emotions play an irreplaceable role in aesthetic activities and aesthetic education, the pursuit of humanistic and artistic beauty, the experience of reverence for moral beauty, the sense of natural life; furthermore, the direct psychological effect of aesthetic education lies in the formation, development and improvement of personal psychological structures. In summary, this study effectively reveals the mechanisms underlying the ability of aesthetic cognition to “influence” the aesthetic behaviour of university students through their aesthetic emotions.

Research suggestions

Marx believed that there are four ways in which human beings can master the world, namely, the scientific way, the artistic way, the religious way and the practical-spiritual way (Bureau of Compilation of the Works of Marx, Engels, Lenin and Stalin of the Central Committee of the Communist Party of China, 2012). In this context, the artistic way refers to human beings' ability to use figurative thinking to see, think and master the laws of the world. Art has its own unique language, and aesthetic education is a way of forming a healthy aesthetic and noble personality through aesthetic appreciation, artistic inculcation and skills training with the help of the image-thinking, emotionally pleasing and freely creative nature of art (Wang, 2020). Aesthetic education has its own developmental rules; thus, in essence, aesthetic education is fundamentally different from the other “four educations”. Moreover, in terms of philosophical goals, the goal of

moral education is to seek and call for the “good” in terms of morality and ethics; the goal of intellectual education is to explore and prove the “truth” regarding the essence of things; and the ideal of aesthetic education is to observe and discover the “beauty” in life (Gu, 2018). Therefore, the development of aesthetic education should first clarify the independence of aesthetic education, and in the process of implementing the aesthetic education curriculum, it is necessary to promote the healthy aesthetic psychological development of students by teaching in accordance with the law of students’ aesthetic psychological development.

Universities are responsible for the important task of training highly qualified people. From science education, knowledge acquisition and the improvement of cognitive abilities to the improvement of aesthetic qualities and the formation of a noble personality, these educational goals are interlinked and mutually reinforce one another in the process of achieving them. The development of science and technology also influences the way in which aesthetic and artistic expression is achieved, and the improvement of rational thinking and the expression of sensual thinking are complementary. Leonardo da Vinci was a great artist as well as an expert in science (Fan, 2018), and a glance at history reveals that many scientists and physicists were also skilled musicians. In this context, it can be seen that rational and perceptual thinking go hand in hand, that the cultivation of cognitive ability is a good way to change an individual’s original way of perceiving and expressing art, and that finding the laws of art through rational thinking is an effective way to promote the improvement of aesthetic ability. According to the results of the questionnaire survey, aesthetic cognitive ability can significantly influence the expression of aesthetic emotions and aesthetic behaviour. In the process of implementing aesthetic education, the acquisition of aesthetic knowledge and the improvement of cognitive ability are important ways of promoting the formation of a noble personality. According to Marxism, beauty is the unity of the subjective and the objective. To appreciate the beauty of things, we must have a mind that is capable of perceiving beauty, and for this perception to be highly rational and active, it must be cultivated through theoretical learning and knowledge. Works of art are created on the basis of objective reality and the experience of their creators and are thus conscious, disciplined creations. In human aesthetic activity, the better the subject’s ability to understand objective reality is, the higher the subject’s level of understanding of the social value of art and the aesthetic elements contained in art. Simultaneously, a systematic understanding of and ability to learn about the history of aesthetics as well as to acquire aesthetic knowledge and skills not only helps the aesthetic subject appreciate art effectively but also to resonate with the life and personality of the creator, thus encountering a higher aesthetic experience.

Aesthetic cultivation is the cultivation of aesthetic sensibility based on human sense organs. Visual aesthetic education, for example, is first and foremost based on the cultivation of visual aesthetic perception, which entails a focus on students’ visual perception, theoretical cognition of visual aesthetics and practical

experience with visual expression. Cognitive and practical experiences act on the body's visual cognitive nervous system, impacting excitatory neurons in the relevant areas of the brain to facilitate aesthetic cognition. In the teaching process, the teacher must have a precise grasp of representative aesthetic materials and must present them in a manner that allows the content of the 'extended aesthetic perspective' to be transformed effectively with the goal of promoting the formation of students' aesthetic cognitive abilities and enhancing their aesthetic experience. Second, it is important to enhance students' aesthetics and to establish an aesthetic connection with real life based on emotion and reason to ensure that they can use the rules and laws of beauty to observe and create and thus to inculcate the correct aesthetic values. Therefore, in the teaching and training process, relevant elements of knowledge are linked to practice to the greatest extent possible; for example, in a classical painting appreciation course, a combination of modelling experience and work appreciation can be used to develop the curriculum.

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