ASIA-PACIFIC JOURNAL OF ECONOMICS, CULTURE & SOCIETY
VOLUME 1, ISSUE 1 (2026)

OPEN ACCESS ARTICLE
ASIA-PACIFIC YOUTH CULTURE FOUNDATION

REVIEW ARTICLE

Advances in Research on the Role of Color and Symmetry in Intangible Cultural Heritage Visual Symbols for Emotion Regulation

Xuan Gan[1], Siyuan Lei[2], Hanzheng Wang[3]

1 Business College of Southwest University, Chongqing, China

2 College of Liberal Arts, Southwest University, Chongqing, China

3 Business College of Southwest University, Chongqing, China

ABSTRACT

Visual symbols of intangible cultural heritage (ICH) combine perceptual form with culturally learned meaning, yet their potential role in emotion regulation remains theoretically fragmented. This narrative review focuses on color and symmetry and integrates evidence from color psychology, Gestalt theory, neuroaesthetics, art therapy, and heritage studies. It proposes a culturally embedded dual-path framework in which low-level visual properties may shape atten - tion, processing fluency, arousal, and autonomic responses, whereas cultural coding may influence appraisal, identity, and perceived safety. The framework further considers the interaction of color and symmetry and the amplifying roles of participation and context. Because direct ICH-specific evidence remains limited, the review distinguishes established findings, indirect evidence, and theoretical propositions. It concludes by identifying priorities for controlled cross-cultural research, standardized physiological and subjective measures, and context-sensitive applications. This perspective connects cultural inheritance with emotion-regulation research without reducing ICH symbols to culturally neutral visual stimuli.

KEYWORDS

Intangible cultural heritage · emotion regulation · color · symmetry

1 INTRODUCTION

1.1 Global emotional health and a rethinking of cultural visual resources: ICH visual symbols as a culturally embedded regulatory system

Emotional disorders have become a major public-health challenge worldwide. The World Health Organization has emphasized that mental-health needs are high across regions, while the Global Burden of Disease study shows that mental disorders remain among the leading contributors to disease burden (GBD 2019 Mental Disorders Collaborators, 2022; World Health Organization, 2022). In this context, non-pharmacological interventions have gained practical importance, including arts-based and culturally grounded approaches that may support emotional expression, social connectedness, and psychological well-being. A WHO evid - ence synthesis covering more than 3,000 studies identified potential roles for the arts in health promotion, prevention, management, and treatment across the lifespan (Fancourt & Finn, 2019). Participatory-arts interventions have also been reviewed as potentially acceptable and beneficial approaches to mental health and well-being, although the strength and consistency of evidence vary across populations and study designs (O'Donnell et al., 2022).

Emotion regulation generally refers to the process by which individuals monitor, evaluate, and modify the occurrence, intensity, and expression of emotions (Gross, 1998). Intro - ducing this definition at the outset is important because emotion regulation is closely related to mental health, cog - nitive functioning, and social behavior (Gross, 1998, 2015). Arts and heritage activities are theoretically relevant because they allow emotion regulation to be examined not only as an internal cognitive strategy but also as a process shaped by cultural resources and external settings. Traditional crafts, heritage narratives, and cultural-art practices are used in educational, community, museum, and digital contexts, but

their specific mechanisms remain underdeveloped in mainstream emotion-regulation research (Fancourt & Finn, 2019).

Intangible cultural heritage refers to practices, representations, expressions, knowledge and skills that communities recognize as part of their cultural heritage and that are transmitted and recreated over time (UNESCO, 2003). Its visual symbols, such as colors, patterns, motifs, shapes and ritual images, have a dual nature: they are visual forms that can be perceived directly, and they are cultural codes carrying memory, identity and value. This dual nature makes ICH particularly suitable for examining culturally embedded emotion regulation. Current studies on heritage experience, virtual cultural tourism and contemporary art in heritage sites show that cultural heritage can be closely tied to emotional response, identity and visitor experience (Lee et al., 2025; Newman et al., 2023; Su, 2018; Su et al., 2020). However, researchers still differ in what they regard as the core mechanism. Some emphasize direct visual stimulation, while others stress interaction or cultural identity. The lack of a shared framework makes an integrative narrative review necessary.

1.2 The historical development of emotion-regulation theory: from individual strategies to a multi-layer framework of perception and culture

Early research paid more attention to the effectiveness of particular strategies such as cognitive reappraisal, acceptance, and suppression. Later research on regulatory flexibility emphasized that the value of a strategy depends on its fit with the situation, personal goals, and available resources (Aldao et al., 2010; Bonanno & Burton, 2013; Gross, 2015). This perspective helps explain why people may respond differently to the same heritage image or craft activity. In ICH settings, engagement with heritage patterns is not only a cognitive choice; historical narratives and cultural familiarity may guide contemporary appraisal (Su, 2018).

Art therapy adds another strand to this discussion. Drawing, craft, image-making, and other non-verbal forms may support emotional expression, symbolic communication, and cognitive restructuring, particularly when emotions are difficult to describe in language. Experimental work also links creative art-making with autonomic nervous-system activity, including heart rate variability (HRV) (Bellaiche et al., 2025; Czamanski-Cohen & Weihs, 2016; Haiblum-Itskovitch et al., 2018). Neuroaesthetics, meanwhile, examines how aesthetic experience is supported by perceptual, emotional, and reward-related brain systems (Chatterjee & Vartanian, 2014; Leder et al., 2004; Pearce et al., 2016). Pleasurable visual experience has been associated with areas such as the medial orbitofrontal cortex (mOFC) and the default mode network (DMN) (Kawabata & Zeki, 2004; Vessel et al., 2012). Taken together, these research strands suggest that emotion regulation is shaped by perception, bodily response, and cultural meaning, rather than by deliberate internal strategies alone. For ICH, this implies that visual symbols may function as culturally framed stimuli whose effects depend on interactions among perceptual properties, cultural memory, and personal identity.

1.3 Theoretical blind spots and research gaps: why visual culture and ICH symbols should enter the scientific discussion on emotion regulation

There are at least three gaps in the existing literature. First, visual psychology has shown that color and symmetry affect emotion, but many experiments use culturally neutral geometric materials and therefore cannot explain how cultural coding changes emotional response (Elliot & Maier, 2014; Huang et al., 2018; Jonauskaite et al., 2020; Makin et al., 2012; Palmer & Schloss, 2010; Treder, 2010; Valdez & Mehrabian, 1994).

Second, although art therapy and environmental psychology indicate that visual experience may support emotional recovery and psychological well-being, most intervention studies evaluate the overall effects of artistic engagement or restorative environments rather than isolating the contributions of color, symmetry, pattern, and composition (Bratman et al., 2019; Van Lith, 2016). Recent reviews likewise suggest that the mental-health effects of arts engagement arise from interacting psychological, social, and neurophysiological mechanisms, while the causal roles of individual visual features remain insufficiently specified (Fancourt et al., 2026).

Third, cultural-heritage studies often describe identity, authenticity and meaning, yet they rarely combine these subjective variables with objective indicators such as HRV, eye movement or electrophysiological signals (Lu et al., 2022; Qiu, 2023; Su, 2018; Su et al., 2020; Yang et al., 2023).

These three gaps correspond to three emerging research directions. The first has stimulated research on the visual design and cultural transformation of ICH symbols. The second has encouraged the use of ICH-related artistic practices in art-therapy and well-being research. The third has led to growing interest in emotional experience within digital and immersive heritage environments. However, these streams have largely evolved in parallel rather than within a unified framework. International studies tend to emphasize general mechanisms, whereas Chinese studies often focus on applied design and local cases. The field therefore lacks an integrative explanation of how visual form, cultural meaning, and physiological regulation interact during emotional processing. This paper treats color and symmetry in ICH as components of a culturally embedded emotion-regulation system and reviews the possible pathways of that system.

By bringing these strands together, this review makes an integrative contribution: it reframes ICH visual symbols as culturally embedded resources whose possible emotion-regulation effects arise from the coordination of perceptual form and cultural meaning. This cross-disciplinary perspective links empirical psychology with living cultural heritage while retaining clear boundaries among direct evidence, indirect evidence, and theoretical inference.

2 LITERATURE SEARCH STRATEGY AND REVIEW METHOD

This paper adopts a narrative review method. Its purpose is not to conduct a strict systematic review or meta-analysis, but to integrate findings from multiple disciplines and develop a theoretical explanation. Chinese literature was searched mainly through CNKI, Wanfang, and VIP using combinations of terms such as “intangible cultural heritage,” “visual symbols,” “color,” “symmetry,” “emotion regulation,” “art therapy,” and “heart rate variability.” Additional Chinese terms, including “ICH digital communication,” “cultural heritage education curriculum,” “rural cultural revitalization design,” “immersive heritage tourism,” and “public cultural space visual design,” were used to cover application-oriented studies. English literature was searched mainly through Web of Science, Scopus, and PubMed using terms including “intangible cultural heritage,” “visual arts,” “color and emotion,” “symmetry,” “emotion regulation,” “neuroaesthetics,” and “heart rate variability.” Additional English terms included “digital heritage,” “heritage art education,” “rural cultural landscape,” “virtual cultural tourism,” and “public space emotional intervention.” Priority was given to studies on ICH visual design, cultural transmission, emotional experience, and psychological effects.

The search covered publications from 2000 through July 2026, with several foundational earlier works retained when necessary. The inclusion criteria were peer-reviewed journal articles or authoritative reports that were directly relevant to emotion regulation, visual or art-based intervention, physiological or neural indicators, or heritage experience. Priority was given to studies conducted in ICH or comparable traditional-art contexts. Conference abstracts and short commentaries were not used as primary evidence, and studies with only a weak connection to visual form or emotion were excluded.

Titles, abstracts and full texts were screened for relevance to the review questions. The final synthesis retained studies according to their evidential directness and credibility and supplemented peer-reviewed research with a small number of authoritative reports from UNESCO and the World Health Organization. Because this is a narrative review rather than a PRISMA-compliant systematic review, it does not claim exhaustive coverage. The analysis distinguishes direct ICH evidence, indirect evidence from general art or heritage studies, and theoretical inference. No original data collection or statistical analysis was conducted.

3 THEORETICAL FOUNDATIONS OF A CULTURALLY EMBEDDED DUAL-PATH FRAMEWORK

3.1 Cultural and psychological value of ICH visual symbols

ICH visual symbols are the visible forms through which embodied skills, ritual practices, and local memory become communicable. They include representational motifs, geometric patterns, color systems, and paired or radial compositions, but their significance cannot be separated from the materials, techniques, occasions, and communities that sustain them. Heritage research therefore treats these forms not as neutral decoration but as culturally coded carriers of authenticity, place identity, and emotional attachment. Contemporary redesign also creates a tension between recognizability and innovation: formal simplification may improve circulation while weakening the community meanings that make a symbol part of living heritage (Lu et al., 2022; Miao, 2025; Su, 2018).

Psychologically, these symbols combine immediate perceptibility with high symbolic density. Color, contour, and symmetry can be registered rapidly, whereas stories, ritual associations, and group memory require interpretation. Research on art-making indicates that visual and material engagement can influence anxiety and autonomic activity, including HRV, particularly when participants retain some choice over materials or tasks. These findings provide indirect rather than ICH-specific support for the proposition that heritage symbols may regulate emotion through perceptual and embodied processes. Within the present framework, art therapy clarifies the participatory pathway, whereas HRV is treated as a downstream indicator of autonomic regulation rather than as a separate explanatory theory (Czamanski-Cohen & Weihs, 2016; Haiblum-Itskovitch et al., 2018).

3.2 Automatic perceptual and cultural-semantic pathways

Rather than forcing together conceptually different models, this review organizes the evidence around two mechanisms. The automatic perceptual pathway begins with low-level properties, including hue, brightness, saturation, contrast, contour, and structural regularity. These properties may rapidly orient attention, alter processing fluency, and bias arousal before a viewer explicitly interprets the image. The cultural-semantic pathway begins when the viewer recognizes a motif, story, ritual function, or group association and uses that knowledge to appraise the image. The pathways are analytically distinct, although in experience they may unfold in close succession and influence one another (Elliot & Maier, 2014; Makin et al., 2012).

A red-and-gold festival motif, for example, may create an initial tendency toward activation through luminance and saturation, while learned associations with celebration or reunion direct the meaning of that activation. An unfamiliar motif may retain the same physical structure without producing the same sense of belonging or safety. The central proposition is therefore that ICH visual symbols may function as a culturally embedded emotion-regulation system through coordination between perceptual form and cultural interpretation, rather than through geometric beauty alone. Because direct ICH-specific experiments remain limited, this proposition is an integrative framework to be tested, not an

established causal model (Jonauskaite et al., 2020; Su et al., 2020).

3.3 Color psychology and culturally embedded color systems

Color research has identified systematic associations among hue, brightness, saturation, and affective evaluation. Brightness and saturation often influence arousal and pleasure, while hue can acquire approach, avoidance, or symbolic associations through context and learning. Large cross-national studies indicate that some color-emotion patterns are broadly shared, but their strength and direction are also shaped by linguistic and geographic proximity. Color effects should therefore be understood as a combination of perceptual regularities and culturally learned associations rather than as fixed universal meanings (Elliot & Maier, 2014; Jonauskaite et al., 2020; Valdez & Mehrabian, 1994).

In ICH contexts, color is also tied to material availability, ecological conditions, ritual conventions, and local craft histories. The same red may indicate celebration, protection, or warning depending on the accompanying motif and setting, while blue-green tones may evoke water, distance, continuity, or coolness through culturally specific narratives. Consequently, statements such as "lower saturation is calming" should be treated as design hypotheses extrapolated from general color-emotion research, not as established rules for ICH. A more defensible approach is to preserve culturally diagnostic color relations while experimentally varying brightness, saturation, and contrast and measuring both emotional response and perceived authenticity (Jonauskaite et al., 2020; Palmer & Schloss, 2010).

3.4 Symmetry, Gestalt principles and neuroaesthetic evidence

Symmetry is an important principle of perceptual organization because regular structures can be detected efficiently and processed with relatively low uncertainty. Behavioral and electrophysiological studies associate symmetry with attention and affective evaluation, while also showing that early detection of symmetry is not identical to later aesthetic preference. Processing fluency offers one explanation: ordered forms are easier to organize and may therefore contribute to positive evaluation, although the effect depends on task, complexity, and context (Huang et al., 2018; Makin et al., 2012; Treder, 2010).

In ICH, formal regularity is layered with culturally specific meaning. Paired figures, radial flowers, or balanced guardian motifs may be interpreted as harmony, continuity, or protection, but current evidence does not demonstrate that each symbolic meaning directly produces a particular emotional outcome. Heritage research instead suggests that authenticity, familiarity, and cultural identity shape how such forms are received. Perfect, approximate, and dynamic symmetry should therefore be treated as testable visual variables rather than as a fixed hierarchy of emotional effectiveness. A plausible mechanism is that structural regularity reduces perceptual uncertainty, while cultural knowledge supplies an interpretation that may strengthen perceived safety (Reber et al., 2004; Su et al., 2020).

4 INTEGRATED EMOTION-REGULATION MECHANISMS OF COLOR AND SYMMETRY

4.1 Low-level perceptual coordination: attention, fluency and autonomic response

Color and symmetry usually appear together within ICH designs, so their effects should not be assumed to be merely additive. Color can bias arousal and affective valence, whereas symmetry can organize the visual field and increase predictability. A visually congruent combination may facilitate fluent processing, but intense saturation or contrast may offset the potential calming effect of an orderly composition. This interaction remains under-tested in ICH research and is best presented as a mechanism-level proposition derived from general visual psychology rather than as a confirmed intervention rule (Elliot & Maier, 2014; Reber et al., 2004).

Potential downstream responses can be assessed through HRV, skin conductance, facial electromyography, eye tracking, and subjective ratings. Symmetry research has linked visual regularity with electrophysiological and affective responses, while art-making studies have reported changes in HRV. Eye-tracking research in architectural heritage also connects patterns of visual attention with positive emotional evaluation, although such evidence is not specific to ICH. Physiological and gaze measures should therefore be interpreted as indicators of attention or autonomic change, not as stand-alone proof of emotion regulation or cultural causality (Haiblum-Itskovitch et al., 2018; Li et al., 2025; Makin et al., 2012).

4.2 High-level cultural coding: appraisal, identity and perceived safety

Perceptual effects become heritage-specific through cognitive appraisal. Viewers interpret color and symmetry through prior knowledge, familiarity, ritual narratives, and judgments of authenticity. A balanced red motif may be read as celebratory or protective in one setting but as threatening or unfamiliar in another. Cultural identity may therefore mediate or moderate the relationship between visual form and emotional response: the stronger the connection between a symbol and the viewer's personal or collective memory, the more likely the image is to acquire emotional direction beyond its physical properties (Lu et al., 2022; Su, 2018; Yang et al., 2023).

The integrated mechanism can be described as a sequence of linked appraisals rather than as a universal stimulus-response rule. Physical configuration first creates a perceptual tendency; recognition of cultural coding then influences meaning, belonging, and perceived safety; these appraisals may subsequently alter the intensity or duration of the emotional

response. Paired motifs and festival colors are illustrative examples, not direct evidence of fixed effects. Cross-cultural studies should compare familiar and unfamiliar viewers while controlling color parameters, symmetry type, and narrative explanation (Jonauskaite et al., 2020; Su et al., 2020).

4.3 Contextual and participatory amplification

Emotion regulation is partly situated in the environment. Repeated exposure to an ordered visual setting may stabilize attention, while explanatory narratives can make cultural meaning available for appraisal. Heritage-site research indicates that visitors may use visual-art encounters for reflection, attentional shifting, and other emotion-regulation strategies, suggesting that culturally framed environments can act as external supports. This evidence supports the contextual component of the model, but it does not establish that any particular ICH color or motif will produce the same response across settings (Newman et al., 2023).

Participation adds sensorimotor rhythm, agency, and material feedback to visual perception. Folding, cutting, stitching, pinching, or arranging patterns can narrow attention and provide a sense of control, while the opportunity to choose materials may strengthen engagement. Art-making studies report reduced anxiety and changes in autonomic activity under some conditions, but they generally do not isolate ICH-specific symbols. Their relevance is therefore indirect: they clarify how making and embodiment may amplify the two visual pathways rather than proving the effectiveness of a particular heritage practice (Bellaiche et al., 2025; Czamanski-Cohen & Weihs, 2016; Haiblum-Itskovitch et al., 2018).

4.4 Integrated model and evidence boundaries

Taken together, the proposed model contains four linked components: the physical configuration of color and symmetry; automatic perceptual and autonomic responses; cultural-semantic appraisal involving meaning, authenticity, and identity; and contextual or participatory amplification. These components may interact recursively rather than in a single linear order. A culturally familiar activity, for instance, may strengthen identity before changing attention, while an initially fluent visual structure may encourage the viewer to engage more deeply with its cultural meaning.

The strength of evidence is uneven across these components. General effects of color, symmetry, and processing fluency have comparatively strong experimental support. Art-making and heritage-experience studies provide indirect support for embodied and contextual mechanisms, whereas direct causal evidence linking specific ICH symbols to standardized emotion-regulation outcomes remains limited. Accordingly, the framework uses cautious terms such as “may,” “can,” and “potential,” and treats the superiority of ICH symbols over culturally neutral stimuli as a question for future controlled research rather than as a demonstrated conclusion.

5 MULTI-SCENARIO APPLICATIONS: EDUCATION, PUBLIC SPACE AND DIGITAL MEDIA

5.1 Educational settings: curriculum integration and psychological education

Education is a common application area for ICH design, but direct evidence linking ICH classroom activities to emotion regulation remains limited. Existing course studies mainly evaluate cultural understanding, creativity, interdisciplinary collaboration and learning engagement. For example, ICH design workshops have used digital and interdisciplinary methods, while paper-cutting courses have been developed to combine cultural learning with English and practical education (Xia et al., 2024; Jia & Zhang, 2025). These studies support the feasibility of curriculum integration, but they do not establish clinical or physiological emotion-regulation effects.

ICH paper art, embroidery and ceramics can be organized through a sequence of cognition, operation and presentation. Students first learn the origin and meaning of a symbol, then make or redesign it by hand, and finally display and reflect on their work. This process may contribute to attention, achievement and self-efficacy, although these outcomes should not be treated as equivalent to verified emotion regulation. A study of 53 university students reported lower Self-Rating Anxiety Scale scores after ceramic art creation, but it did not measure HRV and was not designed as an ICH-specific intervention (Zhang et al., 2024).

The available educational evidence therefore supports course feasibility and creative participation more clearly than emotion-regulation efficacy. Jia and Zhang (2025) and Xia et al. (2024) focus on pedagogical design, whereas Zhang et al. (2024) provides indirect evidence from a university ceramic art course. Future ICH education studies should use validated psychological measures, appropriate comparison groups and follow-up assessment before making stronger claims about emotional benefits.

Current findings also remain limited by small or specialized samples. The duration of any emotional benefit, the contribution of cultural familiarity, and the independent effects of color, pattern and manual activity have not yet been established.

5.2 Public space: cultural landscape and emotional services

In public space, ICH visual design can support cultural recognition and place identity, but direct evidence of stress reduction or emotional treatment remains limited. Urban spaces, historical blocks and rural landscapes may use ICH colors and motifs in signage, wall decoration and small installations. Research on Guangzhou indicates that ICH can help distinguish urban identity and strengthen a sense of

place, but it does not directly test psychological intervention outcomes (Qiu, 2023). The design challenge is therefore to preserve recognizability without assuming that any particular visual arrangement is inherently therapeutic.

As an application extension beyond the paper's primarily visual framework, multisensory design may combine ICH patterns and colors with material texture, lighting, sound, or scent. Such combinations may support rest, reading, and social interaction, but their effects cannot be inferred from visual theory alone. In rural tourism and community development, ICH-based environmental design may also relate to place attachment and local identity (Qiu, 2023). Future research should therefore test visual density, color intensity, motif complexity, and cross-modal congruence as separate variables.

Direct evidence on emotional outcomes is preliminary. Xu et al. (2025) examined a Portuguese Azulejo craft workshop and reported stage-dependent changes in positive emotional arousal during multisensory participation. The study concerned a specific workshop rather than general public-space design, so its findings should not be generalized to all ICH landscapes or clinical settings. Robust full-length trials of ICH-based public-space interventions remain scarce.

Accordingly, public-space design should treat moderate visual stimulation and cultural resonance as testable principles. Future studies should identify thresholds for symbol density, saturation, and multisensory complexity that support comfort without visual overload.

5.3 Digital and immersive scenarios: short video, virtual interaction and soundscape

Digital technology is changing the way ICH visuals are transmitted and experienced. Short-video platforms use rhythm, close-ups and sound to present craft procedures as compact cultural experiences. Repeated actions such as kneading clay, stitching cloth or turning a ceramic wheel may provide an attentional shift, but this possible effect has not been directly established as emotion regulation. Virtual-interaction systems also allow users to select patterns, adjust colors and simulate craft procedures, combining cultural learning with active participation.

AI image generation is another emerging direction. Structure- and color-aware models can generate stylized Chinese ICH images while preserving important compositional and chromatic features (Zou et al., 2025). Eye-tracking research on Yi symbols shows that brightness, layering and line guidance can influence gaze sequence and attention, but it does not test emotion regulation (Yuan & Teeravarunyou, 2025). Hu (2025) examines AI-curated soundscape projects as a mode of redistributing traditional music in urban environments and reports patterns of public engagement rather than clinical emotional outcomes. Digital heritage exposure may also shape how young people classify and evaluate cultural artefact images (Jiang et al., 2025). Taken together, these studies support digital preservation, attention and identity-related engagement; personalized emotional intervention remains a research hypothesis rather than an established application.

Digital ICH interventions therefore need to balance visual accessibility with the depth of cultural interpretation. This requirement points to future research on adaptive systems that match visual-symbol parameters to user context and emotional state.

6 REVIEW AND FUTURE DIRECTIONS

6.1 Common methodological problems in existing studies

Current studies on ICH visual symbols and emotion regulation share several methodological limitations. First, sample representativeness is weak. Many empirical studies use small samples and focus mainly on college students, local community members or specific ethnic groups, while evidence from people with anxiety disorders, older adults, children and socioeconomically diverse groups is still insufficient. Second, experimental control is often inadequate. Some studies attribute emotional change to "visual symbols" as a whole without separating color, symmetry, material texture, manual process and narrative explanation. Color quantification, symmetry classification, interaction strength and digital exposure time are not standardized.

Third, cross-cultural validation remains limited. Most studies are conducted within one cultural context, so it is difficult to distinguish universal effects from culture-specific effects. Fourth, assessment tools are inconsistent. Subjective measures often use general mood scales and do not capture cultural identity or perceived authenticity sufficiently. Objective measures such as eye movement and physiological indicators are still used unevenly. Fifth, research designs are mostly cross-sectional or short-term. They can capture immediate effects but cannot explain whether emotional benefits persist. These limitations should be addressed before ICH visual symbols can be integrated into more formal mental-health services.

6.2 Theoretical level: building an integrated neuro-physio-psychological framework

Based on the methodological limitations identified above, future models should explicitly consider four interconnected components: physical-perceptual triggers, cultural meaning, external situational support, and participatory action. A useful framework would connect aesthetic brain systems such as the mOFC and DMN, physiological indicators such as HRV and electromyography, and subjective indicators such as emotion, perceived safety, and cultural identity (Chatterjee & Vartanian, 2014; Haiblum-Itskovitch et al., 2018; Kawabata & Zeki, 2004; Leder et al., 2004; Pearce et al., 2016; Reber et al., 2004; Vessel et al., 2012). Structural-equation or multi-

level modeling may help clarify the relative weight and sequence of these variables.

The concept of a culturally embedded emotion-regulation system is proposed here as an initial framework. It treats ICH visual symbols as carriers that combine physical-perceptual triggers, cultural meaning, external situational support, and participatory experience. Making or interacting with ICH may therefore differ from passive viewing. Unlike models focused mainly on internal individual strategies, this framework understands emotion regulation as an interaction between individuals and cultural environments. Its theoretical contribution lies in shifting attention from passive geometric appreciation toward active, culturally mediated regulation, while treating identity as a potential moderator of perceptual and emotional responses. The framework could also be extended to compare embodied ICH, such as dance and ritual, with object-based ICH, such as craft products and patterns. In broader social terms, ICH may function as cultural capital that supports locality-adaptation capacity and rural sustainability (Xue et al., 2026).

6.3 Empirical level: enriching ICH-specific data and developing assessment tools

Empirically, future research first needs more experiments using real ICH symbols as stimulus materials. Under controlled color and composition parameters, researchers can compare ICH symbols with ordinary geometric figures in HRV, eye-movement, ERP and subjective-rating indicators. This would help estimate the additional effect contributed by cultural context. Researchers should also compare perfect symmetry, approximate symmetry and dynamic symmetry across different cultural groups, so that visual-intervention strategies can be matched more precisely to different settings.

Longitudinal intervention studies are also needed. For example, studies could compare “ICH visual intervention plus regular counseling,” “ICH visual intervention only” and “regular counseling only” among people with anxiety symptoms or among special groups such as children and older adults. Outcome indicators should include symptom scales, HRV, daily functioning and follow-up changes. At the same time, standardized tools need to be developed. Subjectively, scales should include not only mood but also cultural identity, perceived authenticity and experience quality (Lu et al., 2022; Su, 2018). Objectively, more consistent protocols for HRV, skin conductance, electromyography, eye tracking and neuroimaging would improve comparability across studies.

6.4 Application level: contextualized intervention design and digital platforms

In application, future work should develop context-sensitive ICH visual schemes, but color and symmetry parameters should be tested rather than prescribed in advance. Studies could compare saturation, brightness, contrast and symmetry under controlled conditions across age groups and settings. Pilot applications in schools, community spaces and mental-health services should use validated psychological outcomes and should be revised according to empirical feedback.

The second direction is the construction of digital platforms that combine ICH visual symbols with wearable devices and mobile applications. By collecting heart-rate, sleep and self-reported mood data, such a platform could recommend suitable ICH images, color themes or soundscapes and record changes before and after use. This approach would expand the reach of ICH and provide a basis for more standardized mental-health applications. Ethical issues should also be considered, including privacy, data security and the risk of turning living heritage into a shallow visual resource.

7 CONCLUSION

Based on Chinese and international literature, this review summarizes research on the possible roles of color and symmetry in the emotion-regulation effects of ICH visual symbols. Existing evidence indicates that color properties and symmetry are plausible contributors, but direct ICH-specific causal evidence remains limited. Color may influence arousal and pleasure through hue, brightness, saturation, and culturally learned symbolism. Symmetry may contribute to perceived order and safety through processing fluency and culturally learned meanings. Cultural identity and participatory experience may further shape these effects; however, the comparative advantage of ICH symbols over culturally neutral forms has not yet been established.

ICH visual symbols are already used in educational, public-space, and digital settings, but their emotion-regulation value requires more rigorous evaluation. Future research should use standardized measures, long-term follow-up, cross-cultural comparison, and population-sensitive designs. An integrated neuro-physio-psychological framework and high-quality experiments using authentic ICH materials could clarify the conditions under which such symbols support emotional health. These conclusions therefore indicate potential rather than confirmed clinical or universal effects.

Author Contributions: Author Contributions: Conceptualization, X.G. and S.L.; methodology, X.G. and S.L.; validation, H.W.; formal analysis, X.G., S.L. and H.W.; investigation, X.G. and S.L.; resources, X.G.; data curation, X.G. and S.L.; writing—original draft preparation, X.G., S.L. and H.W.; writing—review and editing, H.W.; supervision, X.G.; project administration, X.G. All authors have read and agreed to the published version of the manuscript.

Funding: Funding: This research was funded by the Undergraduate Training Program for Innovation and Entrepreneurship of Southwest University, grant number S202510635315X. The project is titled "绿织潮韵—AI 赋能废布再生与创意设计" (Green Weave Trend — AI-Empowered Waste Fabric Regeneration and Creative Design), affiliated with the School of Business, Southwest University.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Acknowledgments:The authors would like to express their sincere gratitude to the anonymous reviewers for their con - structive comments and valuable suggestions, which have significantly improved the quality of this manuscript. We also acknowledge the support provided by the Undergraduate Training Program for Innovation and Entrepreneurship of Southwest University (Grant No. S202510635315X). During the preparation of this work, the authors used AI tools for language polishing and reference formatting. The authors have reviewed and edited the AI-generated content and take full responsibility for the content of this publication.

Conflicts of Interest: The authors declare no conflicts of interest.The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

8 ABBREVIATIONS

The following abbreviations are used in this manuscript:

ICH	INTANGIBLE CULTURAL HERITAGE
HRV	Heart Rate Variability
mOFC	Medial Orbitofrontal Cortex
LD	Linear dichroism
DMN	Default Mode Network
WHO	World Health Organization
UNESCO	United Nations Educational, Scientific and Cultural Organization
ERP	Event-Related Potentials
AI	Artificial Intelligence

REFERENCES

GBD 2019 Mental Disorders Collaborators. Global, regional, and national burden of 12 mental disorders in 204 countries and territories, 1990–2019: A systematic analysis for the Global Burden of Disease Study 2019. Lancet Psychiatry 2022, 9, 137–150. https://doi.org/10.1016/S2215-0366(21)00395-3

World Health Organization. World mental health report: Transforming mental health for all. World Health Organization: Geneva, Switzer - land, 2022. https://www.who.int/publications/i/item/9789240049338

Fancourt, D.; Finn, S. What is the evidence on the role of the arts in improving health and well-being? A scoping review. Health Evidence Network Synthesis Report 67. WHO Regional Office for Europe: Copenhagen, Denmark, 2019. https://iris.who.int/handle/10665/329834

O'Donnell, S.; Lohan, M.; Oliffe, J.L.; Grant, D.; Galway, K. The accept - ability, effectiveness and gender responsiveness of participatory arts interventions in promoting mental health and wellbeing: A systematic review. Arts Health 2022, 14, 186–203. https://doi.org/10.1080/17533015.2021.1894463

Gross, J.J. The emerging field of emotion regulation: An integrative review. Rev. Gen. Psychol. 1998, 2, 271–299. https://doi.org/10.1037/1089-2680.2.3.271

Gross, J.J. Emotion regulation: Current status and future prospects. Psychol. Inq. 2015, 26, 1–26. https://doi.org/10.1080/1047840X.2014.940781

UNESCO. Convention for the Safeguarding of the Intangible Cultural Heritage. Available online: https://ich.unesco.org/en/convention (accessed on 31 August 2026).

Lee, J.; Jung, T.; tom Dieck, M.C.; García-Milon, A.; Kim, C.S. Affordance, digital media literacy, and emotions in virtual cultural heritage tourism experiences. J. Vacat. Mark. 2025, 31, 1056–1073. https://doi.org/10.1177/13567667241255383

Newman, A.; Black, N.; Davenport, B. The use of emotion regulation by visitors to contemporary art commissions in heritage sites. Int. J. Herit. Stud. 2023, 29, 1438–1457. https://doi.org/10.1080/13527258.2023.2263759

Su, J. Conceptualising the subjective authenticity of intangible cultural heritage. Int. J. Herit. Stud. 2018, 24, 919–937. https://doi.org/10.1080/13527258.2018.1428662

Su, X.; Li, X.; Chen, W.; Zeng, T. Subjective vitality, authenticity experi - ence, and intangible cultural heritage tourism: An empirical study of the puppet show. J. Travel Tour. Mark. 2020, 37, 258–271. https://doi.org/10.1080/10548408.2020.1740141

Aldao, A.; Nolen-Hoeksema, S.; Schweizer, S. Emotion-regulation strategies across psychopathology: A meta-analytic review. Clin. Psy - chol. Rev. 2010, 30, 217–237. https://doi.org/10.1016/j.cpr.2009.11.004

Bonanno, G.A.; Burton, C.L. Regulatory flexibility: An individual differ - ences perspective on coping and emotion regulation. Perspect. Psychol. Sci. 2013, 8, 591–612. https://doi.org/10.1177/1745691613504116

Bellaiche, L.; Lihardo, K.; Williams, C.; Chaffee, J.; LaBar, K.S.; Seli, P. Selective emotion regulation in creative art production: Psycho - physiological reactivity during painting reduces anxiety. iScience 2025, 28, 112543. https://doi.org/10.1016/j.isci.2025.112543

Czamanski-Cohen, J.; Weihs, K.L. The bodymind model: A platform for studying the mechanisms of change induced by art therapy. Arts Psychother. 2016, 51, 63–71. https://doi.org/10.1016/j.aip.2016.08.006

Haiblum-Itskovitch, S.; Czamanski-Cohen, J.; Galili, G. Emotional response and changes in heart rate variability following art-making with three different art materials. Front. Psychol. 2018, 9, 968. https://doi.org/10.3389/fpsyg.2018.00968

Chatterjee, A.; Vartanian, O. Neuroaesthetics. Trends Cogn. Sci. 2014, 18, 370–375. https://doi.org/10.1016/j.tics.2014.03.003

Leder, H.; Belke, B.; Oeberst, A.; Augustin, D. A model of aesthetic appreciation and aesthetic judgments. Br. J. Psychol. 2004, 95, 489–508. https://doi.org/10.1348/0007126042369811

Pearce, M.T.; Zaidel, D.W.; Vartanian, O.; Skov, M.; Leder, H.; Chatterjee, A.; Nadal, M. Neuroaesthetics: The cognitive neuroscience of aesthetic experience. Perspect. Psychol. Sci. 2016, 11, 265–279. https://doi.org/10.1177/1745691615621274

Kawabata, H.; Zeki, S. Neural correlates of beauty. J. Neurophysiol. 2004, 91, 1699–1705. https://doi.org/10.1152/jn.00696.2003

Vessel, E.A.; Starr, G.G.; Rubin, N. The brain on art: Intense aesthetic experience activates the default mode network. Front. Hum. Neurosci. 2012, 6, 66. https://doi.org/10.3389/fnhum.2012.00066

Elliot, A.J.; Maier, M.A. Color psychology: Effects of perceiving color on psychological functioning in humans. Annu. Rev. Psychol. 2014, 65, 95–120. https://doi.org/10.1146/annurev-psych-010213-115035

Huang, Y.; Xue, X.; Spelke, E.; Huang, L.; Zheng, W.; Peng, K. The aesthetic preference for symmetry dissociates from early-emerging attention to symmetry. Sci. Rep. 2018, 8, 6263. https://doi.org/10.1038/s41598-018-24558-x

Jonauskaite, D.; Abu-Akel, A.; Dael, N.; Oberfeld, D.; Abdel-Khalek, A.M.; Al-Rasheed, A.S.; Antonietti, J.-P.; Bogushevskaya, V.; Chamseddine, A.; Chkonia, E.; Corona, V.; Fonseca-Pedrero, E.; Griber, Y.A.; Grimshaw, G.; Hasan, A.A.; Havelka, J.; Hirnstein, M.; Karlsson, B.S.A.; Laurent, E.; Mohr, C. Universal patterns in color-emotion associations are further shaped by linguistic and geographic proximity. Psychol. Sci. 2020, 31, 1245–1260. https://doi.org/10.1177/0956797620948810

Makin, A.D.J.; Wilton, M.M.; Pecchinenda, A.; Bertamini, M. Symmetry perception and affective responses: A combined EEG/EMG study. Neuropsychologia 2012, 50, 3250–3261. https://doi.org/10.1016/j.neuropsychologia.2012.10.003

Palmer, S.E.; Schloss, K.B. An ecological valence theory of human color preference. Proc. Natl. Acad. Sci. USA 2010, 107, 8877–8882. https://doi.org/10.1073/pnas.0906172107

Treder, M.S. Behind the looking-glass: A review on human symmetry perception. Symmetry 2010, 2, 1510–1543. https://doi.org/10.3390/sym2031510

Valdez, P.; Mehrabian, A. Effects of color on emotions. J. Exp. Psychol. Gen. 1994, 123, 394–409. https://doi.org/10.1037/0096-3445.123.4.394

Bratman, G.N.; Anderson, C.B.; Berman, M.G.; Cochran, B.; de Vries, S.; Flanders, J.; Folke, C.; Frumkin, H.; Gross, J.J.; Hartig, T.; Kahn, P.H.; Kuo, M.; Lawler, J.J.; Levin, P.S.; Lindahl, T.; Meyer-Lindenberg, A.; Mitchell, R.; Ouyang, Z.; Roe, J.; Daily, G.C. Nature and mental health: An ecosystem service perspective. Sci. Adv. 2019, 5, eaax0903. https://doi.org/10.1126/sciadv.aax0903

Van Lith, T. Art therapy in mental health: A systematic review of approaches and practices. Arts Psychother. 2016, 47, 9–22. https://doi.org/10.1016/j.aip.2015.10.003

Fancourt, D.; Stringaris, A.; Sacco, P.L. Mechanisms underpinning the mental health impact of arts engagement. Nat. Rev. Psychol. 2026, 5, 290–302. https://doi.org/10.1038/s44159-026-00545-2

Lu, W.; Su, Y.; Su, S.; Zhao, J.; Zhang, L. Perceived authenticity and experience quality in intangible cultural heritage tourism: The case of Kunqu Opera in China. Sustainability 2022, 14, 2940. https://doi.org/10.3390/su14052940

Qiu, Q. Identifying the role of intangible cultural heritage in distinguishing cities: A social media study of heritage, place, and sense in Guangzhou, China. J. Destin. Mark. Manag. 2023, 27, 100764. https://doi.org/10.1016/j.jdmm.2023.100764

Yang, Y.; Wang, Z.; Shen, H.; Jiang, N. The impact of emotional experience on tourists' cultural identity and behavior in the cultural heritage tourism context: An empirical study on Dunhuang Mogao Grottoes. Sustainability 2023, 15, 8823. https://doi.org/10.3390/su15118823

Miao, H. The dilemma between innovation and authenticity in safeguarding intangible cultural heritage: Community agency in preserving Suzhou pingtan. China Inf. 2025, 39, 323–345. https://doi.org/10.1177/0920203X241290652

Reber, R.; Schwarz, N.; Winkielman, P. Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience? Pers. Soc. Psychol. Rev. 2004, 8, 364–382. https://doi.org/10.1207/s15327957pspr0804_3

Li, X.; Wang, P.; Li, L.; Liu, J. The influence of architectural heritage and tourists' positive emotions on behavioral intentions using eye-tracking study. Sci. Rep. 2025, 15, 1447. https://doi.org/10.1038/s41598-024-85009-4

Xia, J.; Yuizono, T.; Wang, T.-Y.; Kim, E. Intangible cultural heritage course design in the digital age and its effects of interdisciplinary workshop. Educ. Sci. 2024, 14, 325. https://doi.org/10.3390/educsci14030325

Jia, X.; Zhang, R. Teaching Chinese intangible heritage in English—An interdisciplinary pedagogical design for paper-cutting at primary and secondary levels. J. Educ. Learn. Rev. 2025, 2, 133–144. https://doi.org/10.60027/jelr.2025.1750

Zhang, X.; Wen, K.; Ding, H.; Zhou, X. Experiencing art creation as a therapeutic intervention to relieve anxiety: A case study of a university's ceramic art course. Front. Psychiatry 2024, 15, 1334240. https://doi.org/10.3389/fpsyt.2024.1334240

Xu, J.; Wang, Q.; Zhang, A.; Luo, X.; Huang, G. Sensory-mediated "arts on prescription": Emotional arousal mechanisms through Portuguese Azulejo craft workshop. Front. Psychol. 2025, 16, 1595856. https://doi.org/10.3389/fpsyg.2025.1595856

Zou, J.; Du, Y.; Liu, G.; Jiao, Z.; Zhang, H. Generating Chinese intangible cultural heritage images with structure and color awareness. npj Herit. Sci. 2025, 13, 579. https://doi.org/10.1038/s40494-025-02150-7

Yuan, B.; Teeravarunyou, S. Visual strategies for guiding gaze sequences and attention in Yi symbols: Eye-tracking insights. J. Eye Mov. Res. 2025, 18, 57. https://doi.org/10.3390/jemr18050057

Hu, F. AI-curated soundscapes: Spatial reconfiguration of intangible cultural heritage music in urban China. GeoJournal 2025, 90, 273. https://doi.org/10.1007/s10708-025-11503-5

Jiang, Y.; Zheng, X.; Chen, X.; Xiao, Y.; Shen, M. National representations in digital heritage exposure: Exploring young people's in-group/out-group categorisation on cultural artefact visuals and related evaluations. Humanit. Soc. Sci. Commun. 2025, 12, 1743. https://doi.org/10.1057/s41599-025-06030-0

Xue, P.; Dong, Y.; Wang, F.; Wang, S.; Su, W.; Ning, C. Awakening dormant intangible cultural heritage: Bridging capital, capacity, and change for rural sustainability. Habitat Int. 2026, 167, 103654. https://doi.org/10.1016/j.habitatint.2025.103654

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.

Open access article. Distributed under a Creative Commons Attribution 4.0 International licence.

Cite as: Xuan Gan, Siyuan Lei, Hanzheng Wang (2026). Advances in Research on the Role of Color and Symmetry in Intangible Cultural Heritage Visual Symbols for Emotion Regulation. *Asia-Pacific Journal of Economics, Culture & Society*, Volume 1, Issue 1 (2026).