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**„Cross-Cultural Exploration of Aesthetic Experience as Related to Use of Voided
Space in Artwork“**

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Abstract

The study investigates how profound aesthetic experiences can be a direct consequence of the way artwork provides metaphorical “space” where emotions can unfold. Of focus are the cross-cultural discrepancies that exist between Western and Eastern individuals based on the varying cultural understandings of void in artwork. Through an online survey, participants were exposed to 26 works of art – 13 pieces from Eastern culture and 13 from Western culture. Additionally, two further images that portray the artwork *The Monk by the Sea* with varying degrees of void were presented. The respective data was collected in Japan and Austria ($N = 217$). The design was based on the assumption that void in artwork is experienced differently based on one’s culture. Surprisingly, no significant difference in aesthetic experience measured using scales of *Liking*, *Meaningfulness*, *Arousal*, *Interestingness*, and *Aesthetically Moving* was revealed. Regarding the specific investigation of the *Monk by the Sea*, data analysis revealed no significant differences between groups. The last point of interest revealed the same results for both Eastern and Western participants, i.e., the more the participants reported interest in Western or Eastern art, respectively, or art in general, the higher their appreciation (more liked, more beautiful, more interesting) for Western or Eastern art, respectively, and the more they found it self-relevant. Possible conclusions as well as limitations are discussed.

Keywords: aesthetic experience, cross-cultural comparison, void

Abstrakt

Die Studie untersucht, wie tiefgreifende ästhetische Erfahrungen eine direkte Auswirkung darauf haben, wie ein Kunstwerk einen metaphorischen "Raum" schafft, in dem sich Emotionen entfalten können. Der Fokus liegt dabei auf den kulturübergreifenden Unterschieden zwischen westlich und östlich geprägten Individuen, basierend auf den verschiedenen kulturellen Verständnissen von Leere in Kunstwerken. Über eine Online-Umfrage wurden die Teilnehmer mit 26 Kunstwerken konfrontiert - 13 Werke aus dem östlichen Kulturkreis und 13 aus dem westlichen Kulturkreis. Zusätzlich wurden zwei weitere Gemälde gezeigt, die das Kunstwerk "*The Monk by the Sea*" mit unterschiedlichen Graden an Leere darstellt. Die entsprechenden Daten wurden in Japan und Österreich erhoben ($N = 217$). Der Studienaufbau basiert auf der Annahme, dass die Leere in Kunstwerken je nach Kultur unterschiedlich empfunden wird. Überraschenderweise wurde kein signifikanter Unterschied in der ästhetischen Erfahrung festgestellt, die anhand der Skalen *Gefallen*, *Bedeutsamkeit*, *Erregung*, *Interessantheit* und *ästhetisch anregend* gemessen wurden. In Bezug auf die spezifische Untersuchung des Werks *The Monk by the Sea* ergab die Datenanalyse keine signifikanten Unterschiede zwischen den Gruppen. Die letzte untersuchte Fragestellung zeigt dieselben Ergebnisse für sowohl östliche als auch westliche TeilnehmerInnen, d.h. je mehr TeilnehmerInnen Interesse an westlicher oder östlicher Kunst bzw. Kunst im Allgemeinen angaben, desto höher war ihre Wertschätzung (mehr Gefallen, schöner, interessanter) für westliche bzw. östliche Kunst und desto relevanter empfanden sie diese für sich selbst. Mögliche Schlussfolgerungen und Einschränkungen runden die Arbeit ab.

Schlagwörter: ästhetische Erfahrung, interkultureller Vergleich, leerer Raum

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Cross-Cultural Exploration of Aesthetic Experience as Related to Use of Voided Space in Artwork

Research Motivation and Question

Works of art are instigators and facilitators of the viewer's experience (Pelowski et al., 2017), and reports of observers being moved, transformed, and brought to new levels of enlightenment through art are commonly reported across time and cultures (Pelowski & Akiba, 2011). Responses to any given artwork can range from wholly positive to profoundly negative to something in between, and every viewer brings their own set of variables and characteristics that are stimulated and provoked by artwork (Marin & Leder, 2016). These emotional transformations are currently referred to as “transformative aesthetic experiences.” While it may seem logical to assume that certain works of art bring a clear “implicit assumption of universality” in how specific colors or techniques translate into an aesthetic experience (Specker et al., 2020). Specker et al. (2020) have demonstrated that, in general, such an assumption cannot be presumed. Given the range of human characteristics and experiences that attribute to a given response, variations must be assumed based on lived experiences. However, such individual variations and where they divert and converge can feel beyond our ability to sum. We must evaluate the plethora of variables that affect one's aesthetic experience to artwork, so we can begin to see categories and sub-categories emerge that are more or less likely to be present in a given aesthetic response.

Of particular interest in the current paper is the cross-section of variables where culture, art knowledge, and artistic technique meet. The two cultures of attention are Western (German speakers in Austria) and Eastern culture (Japanese speakers in Japan), and the specific artistic technique of interest is the use of void. It is documented that these two cultures have a different aesthetic appreciation of the compositional usage of void in artwork, and familiarity with the technique and the use of the void as a quality of the artwork has

different value levels within each culture (Kodama, 2017). In fact, as the institutional theory of aesthetic judgment states, our conceptualizations of art and beauty are mostly socially determined (Osborne, 1979). Therefore, it is of considerable interest as to whether we can measure varying reactions to artwork based on culture and the varying amount of applied void. We intend to evaluate the cultural appreciation or lack thereof of voided space and analyze if it is transferrable across all artwork from both cultures. Further, the question of whether the amount of voided space has an impact on the aesthetic response will be investigated.

While void has a different function and place based on cultural understanding, and this cultural background can deeply affect one's response to artwork, there are also particular pieces of artwork that provoke incredibly strong aesthetic experiences in their viewers. Are these strong reactions determined by culture or are there certain pieces of art that transcend beyond cultural boundaries due to their profound ability to be aesthetically meaningful? The present research attempts to pair these two queries by not only analyzing reactions across Western and Eastern cultures to various artworks that utilize voided space to different degrees but to also view the inquiry from a different point of view.

Moreover, as a special case, the present study introduced two versions of *The Monk by the Sea* by C.D. Friedrich. The finalized version of this painting utilizes void profoundly, while a previous similar version limits the use of void. The former has been historically known for the strong aesthetic responses it instigates due to its dramatically voided use of space, and thus we ask if a degradation of strength of aesthetic experience is to be expected when the void is less. Further, what of the results when exposing two groups of participants from two cultures, i.e., Western culture and Eastern, to the two similar, yet undeniably different versions. If the strong aesthetic experiences often reported to the final Monk version

is due to the empty space it shows, then a comparison between the two responses would be less profound in the earlier version.

Eastern and Western Aesthetic Experiences

However, in order to make a more general claim regarding void, we also compare aesthetic responses to different paintings and the version of the Monk in two cultures that differ in the way void is familiar in their specific art traditions. One's culture, economic level, and social affiliation have the potential to facilitate widely different aesthetic experiences (Palmer et al., 2013). Specifically, when comparing Western and Eastern viewpoints when having an aesthetic experience, there is a culturally varying understanding which we can assume would result in a varied aesthetic experience across cultures. Carpenter and Graham (1971) have stated that an aesthetically appealing composition has the correct figurative balance within the represented scene. Yet, the balance of an artwork's content is not a universally understood measure; it is culturally bound leading to the assumption that one's aesthetic experience would also be culturally determined. To determine what exactly facilitates the aesthetic experience on a cultural level, we can look at patterns of artwork from a given culture to find the artistic triggers. For example, Eastern art tends to have a horizon line placed upward in the frame, while Western art has the horizon line at a point further down in the frame (Nand et al., 2014). By analysing landscape artwork by Eastern artists from the 15th to the 19th century, Masuda et al. (2008) were able to determine that these works more often displayed higher placed horizons than Western contemporaries. Additionally, Eastern artwork has historically attempted to display an overview of a whole scene, while Western art is more confined to the frame of the viewer (Nand et al., 2014). According to Masuda et al. (2008), Western art focuses more on objects, with less attention given to background details, while Eastern art is about context and the connection between the object and the background (Liu et al., 2013). As such, it can be assumed that the culturally

understood goals of artwork, i.e., Eastern attempts to portray a whole scene compared to Western attempts to show a singular point of view, play a role in the use of space and how the viewer understands the artwork. For a Western observer, open “unused” space can leave the impression of space without purpose -- objects are required to indicate meaningfulness -- yet for the Eastern observer voided space is not disruptive but eventually even creates a more detailed and purposeful narration leading to a more positive aesthetic experience.

Wang et al. (2014) offer another example of culturally related aesthetic experiences. Amongst a sample of Chinese participants, Wang et al. (2014) found that when viewing Chinese landscape art, participants reported, “...higher subjective ratings of relaxation and mind wandering, but lower ratings of object-oriented absorption and recognition” (p.8). While Western landscape paintings are traditionally more realistic – in the sense of being closer to photographic depictions – renderings that offer more literal representations of a scene, Chinese landscapes are less detailed oriented, allowing for a mental state that is more relaxed and wandering (Wang et al., 2014). As such, it could be deduced that the use of space within Chinese landscape artworks are very much expected from the Chinese viewer and instead of bringing a feeling of emptiness, create an aura of serenity and self-reflection.

Of course, an aesthetic experience is a layered occurrence. It is not a question of whether a Western viewer does or does not have an aesthetic experience when viewing an Eastern work of art, but rather the type and depth of experience. While one can perhaps understand the general context of a painting, i.e., workers in a field, or a funeral scene, it can be difficult to understand the cultural, historical, or conceptual factors that one from the relevant culture would almost automatically perceive. Hwang (2019) refers to these factors as “high level information,” and it is this information that can greatly affect an aesthetic experience. According to Hwang (2019), “...cultural factors are operating in this transcultural experience, and it seems to be salient in perceiver’s affective reaction” (p.176). While the

literal technique and placement of brushstrokes within a painting can instigate an aesthetic experience, there are still multiple culturally bound layers at work.

Use of Void in Artwork

Of particular interest in the current research is whether or not the documented understandings of void attributed to both Western and Eastern culture can be measured in artwork evaluation and experience. Aesthetic processing must be viewed as being deeply integrated into cultural contexts and being under the controlling effect of social conditions (Bao et al., 2016). Being that the current study aims to compare the aesthetic experience of a German-speaking European sample with a Japanese sample, these two cultures must be understood in the context of their concepts of artistic techniques and intentions in combination with the use of voided space.

Without question, Japanese conceptions of space in artwork differ from those of the Western world: In Western art, empty voids typically express incompleteness, whereas in Japanese art empty space has a critical expressive function (Kodama, 2017). In Japanese Art culture, there is the concept of *Ma*, which refers to a space, gap, or void (Tseng et al., 2020). Diep (2017) argues that in Chinese landscape artwork “clarity is in the Void and that emptiness is not nothing.” He asserts that Chinese landscape artwork is in line with Daoism by portraying the spirit of nature; the use of empty space does not imply a lack of something but provides a place where the details of the landscape can be imagined and are known to exist (Diep, 2017). Further, Inada (1997) describes how “Oriental art” is sometimes reduced to simple monochrome brush strokes, but this is not correct, as the void around the brush strokes is equally important; the artwork is in fact a complementary whole that brings together the brush strokes and the canvas. The reduction of Eastern artwork to brushstrokes potentially comes from the Western determinist view of the world, yet this viewpoint does not consider the more metaphysical components of Eastern art theory (Juniper, 2003). For example, the

concept of '*yohaku bo bi*' is derived from 12th-century Taoist-influenced Chinese landscape paintings and when applied to Japanese art refers to the beauty of the space left empty (Gad, 2011). Additionally, the religion of Daoism is very present in Chinese landscape artwork. Daoism sees emptiness as a force for understanding existence (Eslami et al., 2020); emptiness is not to be feared or an expression that something is missing. Further, Zheng et al. (2015), in analyzing the spatial composition of ancient Chinese painters, determined that the use of floating mists in white voided spaces on the canvas caused the viewer to appreciate the whole scene, as this empty space was simply an extension of the story being told; it was not, in fact, devoid of narrative.

Similar to our research, Liu et al. (2013) examined how people from different cultures perceive the artwork produced in their own culture or from a different culture. In the Chinese painting style known as ink-wash painting, the primary spirit of the painting is found in the use of empty space (Liu et al., 2013). This allows the viewer to step into a scene that is much bigger than just an object placed within the landscape; instead, an unendingness is created, leaving space for the viewer to use their creativity (Liu et al., 2013). While this use of empty space might create a feeling of incompleteness in viewers from other cultures, Chinese viewers are used to such a technique and therefore are inclined to feel less incongruity (Liu et al., 2013). Additionally, Wang et al. (2014) discuss the technique in Chinese painting known as "drawing blank". This way of applying art to canvas involves a brushstroke technique that results in white streaks coming from the hair of the brush separating (Wang et al., 2014). This creates empty space — a void between lines. According to Wang et al. (2014), "The empty space in traditional Chinese painting is used to give balance, to harmonize the messages in the painting, and to give prominence to concrete images".

Additionally, when it comes to the realm of cultural characteristics in artwork, Western and Eastern painters approach their craft differently in how they portray the visual

environment (Yang et al., 2019). When examining historical patterns, Eastern and Western cultures have applied varying artistic techniques in an attempt to illustrate data from the real world onto canvas (Nand et al., 2014). Western landscapes tend to exactly replicate the environment (Kubovy, 1986), while Eastern landscape are not so static and induce more of a narrative of varying moments in time (Bao et al., 2015). Flexibility exists in Eastern conceptions of space, while space is bounded for Westerners (Vogt, 2013) and within such conceptions, Westerners apply more expectations to the use of space. Therefore, while an Eastern viewer might view a voided space in artwork as a part of the landscape and an actual object within the narrative of the piece, a Western observer sees a space that is lacking. It is this perceived deficiency that potentially creates a sense of inconsistency and imbalance, taking the Western viewer out of the expected artistic pattern and into the unknown. As stated by Palmer et al. (2013), the aesthetic impression left on the viewer is amplified by purposefully breaching what the observer has come to expect.

In consideration of the above-mentioned differences, the current study aims to determine whether this cultural difference of understanding of void will result in a different aesthetic experience between cultures when viewing artwork with various degrees of void from both Western and Eastern cultures, and when viewing both versions of C.D. Friedrich's *The Monk by the Sea*.

The Monk by the Sea

While participants will be exposed to various works of art from both Western and Eastern cultures with various utilizations of voided space, the current research also wanted to apply the research questions to a work of art that is historically known for strong aesthetic responses due to its drastic use of voided space. *The Monk by the Sea* by Caspar David Friedrich has been the focus of intense debate not regarding its artistic elements, but instead due to the intense emotional responses that have been reported by viewers. Painted sometime

between 1808 and 1810 with oil on canvas, it has a unique place in the history of painting, as it deviates from the typical German Romanticism landscapes for which C.D. Friedrich was known. In this difference, it represents a very drastic version of a landscape, devoid of various detail features.

Of further interest is the intentionality that C.D. Friedrich applied to this painting in that he painted over certain detail elements to create an even more empty, voided space. Through the efforts of a recent restoration process (“The Monk is Back” at Alte National Gallery in Berlin), it was revealed that C.D. Friedrich had originally painted three boats on the sea. Yet the final version intentionally includes only sky, beach, and clouds, painted almost abstractly. The viewer is then brought to the reality that they are indeed viewing a landscape by the small figurative monk painted just left of center, standing on the shore, looking out onto the empty sea horizon.

In considering the purposeful changes that C.D. Friedrich made to *The Monk by the Sea* to create a seemingly infinite empty space, and with the reports from C.D. Friedrich’s contemporaries (Heinrich von Kleist: “The viewer feels as if his eyelids have been cut off” [*Berliner Abendblätter*, October 13, 1810]) of intense aesthetic experiences when viewing the painting, we begin to attribute these strong emotional experiences to the vast void which becomes a metaphorical space for the viewer’s feelings to unfold. While the absolute intention behind the emptiness portrayed in *The Monk by the Sea* can never truly be known, it has been noted that many of C.D. Friedrich’s paintings follow this artistic pattern. James Elkins (2005) wrote that Friedrich’s paintings “...are hungry paintings. They pull their viewers in, enticing them with loneliness. But you can’t find your footing in the empty spaces, and you start to lose yourself” (2005). Elkins (2005) followed the idea that the vastness and emptiness of such artwork create a moment of confusion where the beholder cannot determine the artist’s intent. It is at this moment of confusion that the opportunity

arises for self-reflection within the depths of the void on the canvas. It could in fact be argued that the viewer's expectations when viewing the final version of *The Monk by the Sea* are not met in that the lack of details and depth create a moment of discrepancy for the viewer.

According to Pelowski (2015), such discrepancy instigates a physical response of the sympathetic nervous system, leading to a more rapid heart rate and a change in the heat and electricity passed through the skin. Carver (1996) argues that the more something goes against one's expectations, the greater the degree of internal discord, creating a more profound experience. The argument even exists that the unequivocal aim of works of art, and the inherent task of an effective artist, is to unsettle what is anticipated and instead confront the viewer with a new way in which to conceive what is being presented (Pelowski, 2012). *The Monk by the Sea* indeed did not meet the typical expectations of such a seascape and forces the viewer to digest and confront the unexpected.

The expanse of sky is generous but unattainable. The sea, comprising the middle distance, which traditionally the landscape viewer expects will convey him to infinity, is a shrunken narrow strip, while the foreground, which should accommodate his first steps into the spatial illusion, is abruptly shorn off, and as explained above, distanced from the picture plan, which no longer unites the illusion with the viewers space as a common wall. One is no longer at the threshold of the scene but confronting it across an unbridgeable division. (It is as though space has been transposed from background to foreground; Miller, 1974, p. 207)

An additional description further highlights the plethora of discrepancies presented by the painting:

The result of imprecise scale relations is paradoxical: the open seems to recede infinitely back into space, while at the same time the ocean, sky and dunes spread out horizontally. Both movements are not equal, though, for the stronger planar reading overpowers the linear perspective (reading back into space). The vacant foreground that seems to fall away increases the sensation of two-dimensionality as does the monotonous horizontal expanse. Thus not only can the mind not grasp this expanse, but it is also subjected to an equivocation between a two-dimensional and three-dimensional reading of space (Kuzniar, 1989, p. 78).

Therefore, with all the discussion of the use of void as an instigator for emotional responses, can we identify within the current study the differences in the way the final and the preliminary version of *The Monk by the Sea* are perceived and the kind of aesthetic experiences they elicit? It is critical to acknowledge that various accounts of a strong aesthetic experience when viewing *The Monk by the Sea* are coming from a Western cultural point-of-view. An aesthetic experience is based on the perception and interpretation of the viewer (Augustin & Leder, 2006), and cultural components are embedded within these processes of evaluation. This begs the question of whether these aesthetic experiences related to void are culturally bound, or if *The Monk by the Sea* is so emotionally poignant that its reach goes beyond cultural boundaries. Will Eastern participants have an appreciation for the void or will they be equally brought into a sense of imbalance due to the drastic use of space?

Current Study

This study was planned as a joint project between the EvaLab (Prof. Helmut Leder) at the University of Vienna and Takumi Tanaka (a post-doc fellow) at the University of Tokyo. To understand any cultural differences in artwork rating when presented with works of art

with varying degrees of void, German-speaking Europeans and Japanese-speaking Eastern participants were recruited from the University of Vienna and via the Japanese crowdsourcing service CrowdWorks, respectively. Psychology students from the University of Vienna were compensated with course credits as a partial fulfilment of their program requirements. Through one online session, participants rated 26 works of art on six scales related to our five direct variables (*Liking*, *Meaningfulness*, *Arousal*, *Interestingness*, and *Aesthetically Moving*), followed by the presentation of the two versions of *The Monk by the Sea* with the same six rating scales. Participants were then prompted to fill in questionnaires on art interest and art knowledge, as well as demographic variables. It is expected that the higher the level of void, the higher the quality of appreciation (more liked, more beautiful, more interesting) is to be attributed to the painting by Eastern participants. The contrary is expected for Western participants: the lower the level of void, the higher the quality of appreciation (more liked, more beautiful, more interesting) is to be attributed to the artwork. When it comes to *The Monk by the Sea*, Western participants are expected to appreciate (more liked, more beautiful, more interesting) the version with the boats, while Eastern participants will show more appreciation (more liked, more beautiful, more interesting) for the version without the boats. We hypothesize that the more a participant has interest in Eastern art (measured using the Vienna Art Interest and Art Knowledge Questionnaire), the more they will appreciate the presented Eastern works of art and find these works more self-relevant. Conversely, the more interest reported in Western art, the higher the levels of appreciation for Western art and self-relevance to the participant can be expected.

Method

Participants: Sample and Sample Size Computation

Sample size was calculated a priori with G*Power 3.1 (Faul et al., 2007) by using MANOVA Global Effects for two independent groups with small effect size (Cohen's $f =$

0.1). As there were no previous studies available on aesthetic preference ratings on art that focused specifically on a cross-cultural context, we estimated small effect size to conduct a safeguard power analysis. The power analysis indicated a total sample size of 182 participants to achieve a power of .90 with an α of .05 for the two groups (Japanese vs. Austrian) for six variables (Liking, Calming [Low arousal], Active [High arousal], Aesthetically moving, Interestingness, Meaningfulness).

Non -Expert Sample

Demographic characteristics

A total sample of 221 participants were recruited, however, four Austrian participants were excluded from the sample due to incomplete responses, leaving us with a sample of 217 respondents for data analysis. Out of the total sample, 112 (51.6%) were Austrian and 105 (48.4%) were Japanese. A higher proportion (68.7%) were female (149 respondents) and 66 (30.4%) were male, with two respondents identifying as “other”. The respondents had an average age of 33 years with the lowest age being 18 years old and the oldest 68 years old. The respondents were asked whether they had ever lived in a different country and 78.8% said they had not whereas only 21.2% reported having lived in a different country. Psychology students from the University of Vienna were compensated with the fulfillment of degree requirements or earned extra course credit by participating. For the Japanese sample, Takumi Tanaka (a post-doc fellow at the University of Tokyo) collected the data via the “Crowdworks” platform. Respondents included not only university students (like the Austrian sample), but individuals with various demographic backgrounds. All 105 Japanese participants then received monetary compensation for their participation.

Table 1.

Demographic Characteristics

	Frequency	Percent
Gender		
Female	149	68.66
Male	66	30.41
Other	2	0.92
Age mean; range	32.6	[18–68]
Group		
Austrian	112	51.61
Japanese	105	48.39
Lived in different country		
No	171	78.80
Yes	46	21.20

Design and Procedure

The survey was translated into two identical versions: one in the German language for participants in Austria and the other in the Japanese language for participants in Japan. Before the experiment began, all participants provided written consent and were informed that participation and data collection were fully anonymous. Participants could stop at any time during the experiment without further consequences. A written explanation of the procedure was provided along with specific instructions to take one's time and truly indulge and experience the presented stimuli, i.e. artwork. Emphasis was placed on the importance of an honest and spontaneous personal impression. Stimuli were presented to the participants in a block-wise manner with a total of two blocks, and within each block, the images were randomized. The first block contained 26 works of art with varying degrees of void (13 from Western culture and 13 from Eastern culture) and the second block contained two versions of *The Monk by the Sea*: one version with boats and one version without boats. To assure that participants took their time to fully consider the presented artwork, each piece of art was displayed full screen for 30 seconds before the participant was allowed to move on to the next page with a smaller version of the artwork and the six questions to be answered on a 7-point Likert scale. The 30 seconds of full-screen viewing was intended to maximize the attention the participants gave to the stimuli and to prevent rushing through the experiment.

As previous research has demonstrated the average time that most people look at art in a museum to be just under 30 seconds (Smith & Smith, 2001), we deemed 30 seconds an appropriate amount of time for the participant to view the artwork without the feeling of being forced. Separation of the 26 images from the two versions of *The Monk by the Sea* was done due to the similarity of the two latter images – a similarity not seen in the previous 26 images – and to emphasize again the instructions to deeply engage and consider the works of art. The instructions acknowledged the similarity of the two paintings, but participants are asked to still consider both separately and to not let the first presented image influence the second (both versions were presented randomly). The use of not only both versions of *The Monk by the Sea* but also 26 Western and Eastern works, all of which utilize voided space, was intended to help further extrapolate any cultural differences and to highlight any significance as related to aesthetic experience, personal meaningfulness, and void.

Measures

Demographic measures. Participants were asked to indicate their most accurate gender description (*female, male, or other*), their age in years, and their subject of current or previous study. To ensure the validity of the cultural comparison, participants were additionally asked to state their citizenship, the country in which they grew up, the country where they are currently living, if they have ever lived in another country, what they consider to be their mother-tongue, and with which culture they identify. These questions were intended to make certain that the participant did indeed identify with either Western or Eastern culture.

To additionally determine familiarity and interest in various types of artwork, we asked about interest in Western art and interest in Asian art separately on a 7-point Likert scale (1 being “not at all” and 7 being “very much”).

Aesthetic experience. Of interest to the current research is one's aesthetic experience as a result of the attributed personal meaningfulness participants feel when viewing the various works of art. To measure these responses, six scales related to five dependent variables were created. The five dependent variables include *Liking*, *Meaningfulness*, *Arousal*, *Interestingness*, and *Aesthetically Moving*. The dependent variable of *Arousal* was measured on two scales: one focusing on high arousal ("When I look at this artwork, I feel very active") and the other focusing on low arousal ("When I look at this artwork, I feel very calm"). The other four dependent variables were measured using one scale each. All participant responses were given on a 7-point Likert scale with one indicating "Not at all" and seven indicating "Very much." (*supplemental material XI*).

Art Interest Scale. When assessing variables related to aesthetic experience, of crucial importance is the viewer's art-related knowledge (Leder et al., 2004). Expertise has been shown to result in altogether more increased assessments of the degree to which artworks were "liked, experienced as emotional, comprehended, and to what extent experienced as arousing" (Leder et al., 2012). Therefore, application of the Vienna Art Interest and Art Knowledge scale was introduced (Specker et al., 2020). The VAIK (Specker et al., 2020) separates art expertise into two sections— art knowledge and art interest. The scale, which consists of three sections (A, B, and C), was used in its entirety. Part A (*supplemental material X*), which focuses on art interest and behaviors and attitudes indicating interest in the arts, is a subscale that contains eleven items, assessed on a scale from 1 to 7. Seven items appraise the self-reported agreement to certain statements (example: "*I enjoy talking about art with others*", 1 = *not at all*, 7 = *absolutely*). Four items inquire about the participants' frequency of certain art-related conduct (example: "*How often do you view images of artworks [picture books, internet, etc.?]*", 1 = *less than once a year*, 7 = *once per week or more*). Parts B and C include a focus on art knowledge and assess participants'

using objective items regarding artist, style, and iconography identification (Cotter et al., 2021). Results are based on six multiple choice questions and 10 items in which participants need to indicate the artist and style of the presented artworks (26 items). Art knowledge scores indicate the number of items answered correctly (Cotter et al., 2021). It should be noted that for data analysis, the results for Part B and C were not used as part of the current research. The choice to still have participants respond to sections B and C was to provide additional data for potential future analysis that is beyond the scope of this Master's thesis.

Materials

Stimuli. A set of 28 images with high-level features was chosen for the current research, as previous research has shown that images with lower-level features can reduce external validity (Specker et al., 2020b). Half the images are of Eastern origin stimuli, and half are of Western stimuli, all with varying degrees of void. An exhaustive list of the artwork used can be found in the *supplemental material section XII*. All paintings were sourced through an online search. The pictures were rated by the participants for *liking*, *aesthetically moving*, *meaningfulness*, *arousal*, and *interestingness* based on a 7-point Likert Scale. Any Kangi or any form of script present in the artwork was removed with Adobe Photoshop in such a way that the removal was not visible or obvious to the participant. This eliminated any chance of text providing context or emotion which could affect the viewer. For copyright reasons, no example pictures can be displayed here.

Complexity Analysis

To have comparable images from both Eastern and Western cultures, all images were first roughly matched into pairs based on color, balance of details, and even specific details (for example, having a boat in both images). This resulted in matched pairs with one Eastern piece of art and one Western piece of art. However, this was not done quantitatively, and in

order to truly quantify what denotes complexity within an image, more must be taken into account.

...visual complexity has to be considered to be a multidimensional construct, consisting of at least two dimensions: A quantitative factor positively related to complexity and linked to number of elements or similar measures, and a structural factor negatively related to complexity linked to order and mostly determined by symmetry (Gartus & Leder, 2017).

Therefore, to provide a more quantifiable justification for our matched pairs, a compression analysis was performed to access image complexity so that all images had an assigned objective measure of visual complexity, i.e., those components corresponding to the amount and diversity of information within a given image (Van Geert & Wagemans, 2020). Pre-processing of all images was done with edge detection and simple down-sizing using a low pass-filter. Noise in the image affects compression size and thus also estimated complexity, therefore a low pass-filter was utilized to help minimize any image noise. Two equally sized “cut-outs” of all images were then created: one cut-out with the empty space and the other cut-out with the complex detailed elements. Next, an algorithm was chosen that best differentiated between the two cutouts. This resulted in parameters that distinguished between void and other detail areas, and when applied to the whole image provided a reasonable correlate for image complexity. Matlab code was then utilized to determine a range of complexity measures (entropy, fractal dimension, PNG, GIF, JPEG, PHOGC, etc.) with varying downsizing factors, and from these results, we then selected PNG16 as our preferred covariate measure. This measure was then used to obtain our objective measure of visual complexity. While entropy provided the highest correlations with the criterion variable (with not much influence of the downsizing factors) and can differentiate best between complex and empty cut-outs, it is generally not considered to be a very good predictor of

visual complexity. For instance, Marin and Leder (2013) found only correlations of about $r = .30$ between entropy and subjective ratings of visual complexity. While with PNG16 there are no ground truth ratings that we could use to evaluate the predictors and only a binary variable as the criterion is used, PNG16 as a compression-based complexity parameter proved best for our needs.

The PNG compression rate was calculated as the mean PNG file size of the downsized image and the downsized image rotated by 90 degrees divided by the size of the uncompressed downsized image. Dimensions were downsized by a factor of 16 to filter out high spatial frequencies which are not considered, or at least less considered, in visual complexity ratings by human subjects. Simply stated, larger PNG16 values meant “more complex” (or “less empty”). We were then able to use the PNG16 values as quantifiable measures of void in our task of determining if artwork with more or less voided space affected rates of appreciation (more liked, more beautiful, more interesting) amongst our two sample groups (Western vs. Eastern participants).

Translation. All materials have been translated from English to Japanese and reviewed by a Japanese native speaker with psychological training at the post-graduate level. Before this step, all materials were translated from German to English by the author. All scales are available in English, Japanese and German (supplemental material XI).

Data Analysis

Labvanced (Goeke et al., 2017) was used not only to conduct the experiment itself, but also offered a means to obtain data. Demographic characteristics were analyzed using descriptive statistics such as frequencies, mean and median and presented using a table. Normality tests were done using skewness, kurtosis and Kolmogorov-Smirnov which compares data or scores with a given distribution so as to ascertain whether the data or scores have the same distribution. To determine the linear relationship of the variables Pearson

product correlation and Spearman's correlation were employed where applicable. Wilcoxon signed-rank test was used to compare continuous non-normal distributed variables, whereas regression analysis was used to compare normally distributed variables where applicable. A $p\text{-value} < 0.05$ was considered significant. Excel and SPSS statistical software were used for data analysis.

Results and Interpretation

Hypothesis H1a

H1a: The higher the level of void, the more Eastern participants appreciate the artwork (more liked, more beautiful, more interesting).

Table 2 summarizes the descriptive results (Mean, Median, Std. Deviation) for the void and average rating for the variables of beauty, interestingness, and liking as well as the average scores for the variable of appreciation of artwork (more liked, more beautiful, more interesting) as rated by the Eastern participants to the different artworks. Test for normality was done using Skewness and Kurtosis. The results shows that values for skewness or kurtosis were less than ± 1.0 , meaning the distribution was considered normal.

Table 2.

Descriptive Statistics (Eastern Participants)

Variables	Mean	Median	Std. Deviation	Skewness	Kurtosis
Void	0.13	0.12	0.04	0.26	-0.17
Beauty	3.95	3.95	0.46	-0.55	-0.31
Interestingness	4.31	4.39	0.43	-1.08	1.03
Liking	4.22	4.40	0.65	-0.57	-0.42
Appreciation	4.16	4.26	0.46	-0.78	-0.28

Pearson's correlation was measured to determine the relationship between the two variables of void and appreciation of artwork as rated by the Eastern participants when viewing the various artworks. There was a moderate, positive correlation between void and

appreciation for artwork, which was not statistically significant ($r = 0.310$, $n = 28$, $p = 0.108$). Therefore, as the void increased (lower the level of void, i.e. “more complex” or “less empty”), the more Eastern participants reported appreciation (beauty/liking/interestingness) of the presented works of art.

After correlation, simple linear regression was used to test if void significantly predicted Eastern participants’ appreciation for the artwork (more liked, more beautiful, more interesting). The overall regression model was not statistically significant ($R^2 = 0.096$, $F(1, 27) = 2.766$, $p = 0.108$). It was found that the presence of void non-significantly predicted appreciation for the artwork ($\beta = 5.14$, $p = 0.108$). For a one unit increase in void, there is a 5.14 unit increase in appreciation of Eastern art. The fitted regression model was as follows: $\text{Appreciation} = 3.416 + 5.14 * (\text{void})$.

Table 3.

Regression Analysis (Eastern Participants)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Coefficients	B	Std. Error	Beta		
(Constant)	3.416	0.398		8.580	<0.001
Void	5.138	3.089	0.310	1.663	0.108

Dependent Variable: Appreciation
Predictors: (Constant), Void

Hypothesis H1b

H1b: The lower the level of void, the more Western participants appreciate the artwork (more liked, more beautiful, more interesting).

Table 4 below summarizes the descriptive results (Mean, Median, Std. Deviation) for the void and average rating for the variables of beauty, interestingness, and liking as well as the average scores for the variable of appreciation of artwork (more liked, more beautiful,

more interesting) as rated by the Western participants. Test for normality was done using Skewness and Kurtosis. Results show that values for skewness or kurtosis were less than ± 1.0 , meaning the distribution was considered normal.

Table 4.

Descriptive Statistics (Western Participants)

Variables	Mean	Median	Std. Deviation	Skewness	Kurtosis
Void	0.12	0.12	0.04	0.39	-0.22
Beauty	3.87	3.79	0.60	-0.23	-0.42
Interestingness	4.53	4.64	0.59	-0.57	1.02
Liking	4.58	4.67	0.69	-0.48	0.10
Appreciation	4.33	4.32	0.58	-0.34	-0.08

Pearson's correlation was measured to determine the relationship between the two variables of void and appreciation of artwork as rated by the Western participants when viewing the various artworks. There was a moderate, positive correlation between void and appreciation, however it was not statistically significant ($r = 0.364$, $n = 28$, $p = 0.057$). Therefore, as the void increased (lower the level of void, i.e. "more complex" or "less empty") the more Western participants reported appreciation (beauty/liking/interestingness) of the work of art.

After correlation, simple linear regression was used to test if void significantly predicted Western participants' appreciation for the artwork (more liked, more beautiful, more interesting). The overall regression model was not statistically significant ($R^2 = 0.133$, $F(1, 27) = 3.976$, $p = 0.056$). It was found that void non-significantly predicted appreciation for the artwork ($\beta = 5.91$, $p = 0.056$). For a one unit increase in void there is a 5.91 unit increase in appreciation of Western art. The fitted regression model was as follows:
 Appreciation = $3.595 + 5.91 * (\text{void})$.

Table 5.*Regression Analysis (Western participants)*

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Coefficients	B	Std. Error	Beta		
(Constant)	3.595	0.381		9.415	< 0.001
Void	5.907	2.962	0.364	1.993	0.056

Dependent Variable: appreciation
Predictors: (Constant), Void

Hypothesis H2a

H2a: Western people appreciate *The Monk by the Sea* with the boats more (more liked, more beautiful, more interesting).

Current research aimed to determine whether Western participants appreciated (more liked, more beautiful, more interesting) *The Monk by the Sea* with the boats more compared with *The Monk by the Sea* without the boats. Descriptive statistics showed that the average scores for the appreciation of *The Monk by the Sea* with the boats was as follows: mean = 14.79; median = 15). This was slightly lower than the average scores for the appreciation of *The Monk by the Sea* without the boats (mean; median = 14.92; 15) as rated by Western participants.

Kolmogorov-Smirnova normality test was conducted to determine the appropriate test to measure if there was a significant difference in the appreciation of the two versions by Western participants. The normality test showed that the appreciation scores for *The Monk by the Sea* with and without the boats were not normally distributed ($p < 0.05$). A nonparametric test, i.e., a Wilcoxon signed-rank test, was used to determine if there was a difference in participants' appreciation of *The Monk by the Sea* with and without the boats, and showed that there was no statistically significant difference in the appreciation (more liked, more

beautiful, more interesting) of *The Monk by the Sea* with the boats compared with *The Monk by the Sea* without the boats by Western participants. ($Z = -0.334, p = 0.738$). Indeed, median appreciation score rating was 15.0 for both *The Monk by the Sea* with the boats and *The Monk by the Sea* without the boats.

Table 6.

Descriptive Statistics (Western Participants)

				Std.		Kolmogorov-Smirnov	Wilcoxon Signed
				Mean	Median	Normality test	Ranks Test
				Deviation		Statistic	p-value
Appreciate Monk with the boats	12	4.79	4.261	15.00	0.109	.002	-0.334
Appreciate Monk without the boats	12	4.92	4.153	15.00	0.129	.000	0.738

Hypothesis H2b

H2b: Eastern people appreciate the Monk without the boats more (more liked, more beautiful, more interesting).

Current research aimed to determine whether Eastern participants appreciated (more liked, more beautiful, more interesting) *The Monk by the Sea* without the boats more compared with *The Monk by the Sea* with the boats. Descriptive statistics showed that the average scores for the appreciation of *The Monk by the Sea* without the boats were as follows: mean = 7.96; median = 8.0. This was slightly higher than the average scores for the appreciation of *The Monk by the Sea* with the boats (mean; median = 7.91; 8.0) as rated by Eastern participants.

Kolmogorov-Smirnov normality test was conducted to determine the appropriate test to measure if there was a significant difference in the appreciation of both versions by the Eastern participants. The normality test showed that the appreciation scores for *The Monk by*

the Sea with and without the boats were not normally distributed (p -value <0.05). A nonparametric test, i.e., a Wilcoxon signed-rank test was used to determine if there was a difference in Eastern participants' appreciation of *The Monk by the Sea* with and without the boats. The test showed that there was no statistically significant difference in the appreciation (more liked, more beautiful, more interesting) of *The Monk by the Sea* without the boats compared with *The Monk by the Sea* with the boats by Eastern participants despite having a higher mean score ($Z = -0.334$, $p = 0.731$). The median appreciation score rating was 8.0 for both *The Monk by the Sea* without the boats and *The Monk by the Sea* with the boats.

Table 7.

Descriptive Statistics (Eastern Participants)

			Std. Mean Deviation	Median	Kolmogorov-Smirnova		Wilcoxon Signed Ranks Test	
					Statistic	Sig.	Z statistics	p-value
Appreciate Monk with the boats	05	.91	2.422	8.0	0.128	.000	-0.334	0.731
					0.111			
Appreciate Monk without the boats	05	.96	2.477	8.0		.003		

Hypothesis H3a

H3a: The more participants are interested in Eastern art/art in general (VAIAK Section A), the more they will appreciate the presented Eastern art (more liked, more beautiful, more interesting) and find it more self-relevant.

Current research aimed to establish whether there was a relationship between interest in Eastern art and scores of appreciation (more liked, more beautiful, more interesting) and self-relevance as related to Eastern artwork. Descriptive statistics of the scores of how participants rated the Eastern artwork are presented below (Table 7). Kolmogorov-Smirnova normality test showed that the three variables were not normally distributed ($p < 0.05$).

Being that the variables were not normally distributed, a Spearman's rank-order correlation was run to determine the relationship between interest and appreciation of Eastern art. There was a moderate, positive correlation between interest and appreciation of Eastern art, which was statistically significant ($r_s(215) = 0.334, p < 0.001$). An increase in art interest scores resulted in an increase in appreciation scores. Similarly, Spearman's rank-order correlation was also conducted to determine the relationship between interest and self-relevance of Eastern art. There was a weak, positive correlation between interest and self-relevance of Eastern art, which was statistically significant ($r_s(215) = 0.203, p = 0.003$). An increase in interest scores resulted in an increase in self-relevance scores.

Table 8.

Descriptive Statistics Eastern Art Interest

	N	Mean	Median	Std. Deviation	Kolmogorov-Smirnova Normality test		Spearman's rho	
					Statistic	Sig.	Correlation Coeff.	Sig.
Appreciate	217	171.7	175	34.6	0.062	0.039	0.334**	<0.001
Self-relevance	217	55.3	56	12.8	0.069	0.015	0.203**	0.003
Interest	217	39.3	40	14.6	0.065	0.028	1	

Correlation with variable 'interest'
 **. Correlation is significant at the 0.01 level (2-tailed).

A simple linear regression was used to test if interest in Eastern art significantly predicted participants' appreciation for Eastern artwork (more liked, more beautiful, more interesting) and self-relevance of Eastern art.

The first regression model (*Interest vs Appreciation of Eastern Art*) was statistically significant ($R^2 = 0.087, F(1, 216) = 20.462, p < 0.001$). It was found that interest in Eastern art statistically significantly predicted appreciation for Eastern artwork ($\beta = 0.69, p < 0.001$). For a one unit increase in interest in Eastern art there is a 0.69 unit increase in appreciation of

Eastern art. The fitted regression model was as follows: Appreciation for Eastern artwork = $144.2 + 0.69 * (\text{Interest in Eastern art})$.

The second regression model (*Interest vs Self-relevance of Eastern Art*) was statistically significant ($R^2 = 0.037$, $F(1, 216) = 8.235$, $p = 0.005$). It was found that interest in Eastern art statistically significantly predicted Self-relevance for Eastern artwork ($\beta = 0.17$, $p = 0.004$). For a one unit increase in interest in Eastern art, there is a 0.17 unit increase in Self-relevance of eastern art. The fitted regression model was as follows: Self-relevance for Eastern artwork = $48.62 + 0.17 * (\text{Interest in Eastern art})$.

Table 9.

Regression Analysis Eastern Art Interest

Models	Coefficients	Unstandardized Coefficients	Std. Error	Standardized Coefficients Beta	t	Sig.
Dependent Variable:	(Constant)	44.2	6.47		22.25	<0.001
Appreciate eastern art	Interest	0.69	0.15	0.29	4.52	<0.001
Dependent Variable:	(Constant)	48.62	2.47		19.67	<0.001
Self relevance eastern art	Interest	0.17	0.05	0.19	2.86	0.004

Hypothesis H3b

H3b: The more participants are interested in Western art/art in general (VAIAK Section A), the more they will appreciate western art (more liked, more beautiful, more interesting) and find it more self-relevant.

Current research aimed to establish whether there was a relationship between interest in Eastern art and scores of appreciation (more liked, more beautiful, more interesting) and self-relevance as related to Western artwork. Descriptive statistics of the scores of how participants rated the Western works of art are presented below (Table 9). Kolmogorov-Smirnova normality test showed that appreciation, self-relevance and interest in western art were normally distributed ($p > 0.05$).

Pearson's correlation was conducted to determine the relationship between interest and appreciation of Western art. There was a moderate, positive correlation between interest and appreciation of Western art, which was statistically significant ($r = 0.391, p < 0.001$). An increase in interest scores resulted in an increase in appreciation scores. Similarly, Pearson's correlation was also implemented to determine the relationship between interest and self-relevance of Western art. There was a moderate, positive correlation between interest and self-relevance of Western art, which was statistically significant ($r = 0.321, p < 0.001$). An increase in interest scores resulted in an increase in self-relevance scores.

Table 10.

Descriptive Statistics Eastern Art Interest

	N	Mean	Median	Std. Deviation	Kolmogorov-Smirnova normality test		Spearman's rho	
					Statistic	Sig.	Correlation Coeff.	Sig.
Appreciate	112	180.7	181	32.55	0.051	.200*	0.391**	<0.001
Self-relevance	112	60.02	60	11.95	0.058	0.071	0.321**	<0.001
Interest	112	39.89	41	14.76	0.059	0.068	1	

Correlation with variable 'interest'
 **. Correlation is significant at the 0.01 level (2-tailed).

A simple linear regression was used to test if interest in Western art significantly predicted participants' appreciation for Western artwork (more liked, more beautiful, more interesting) and self-relevance of Western art.

The first regression model (*Interest vs Appreciate Western art*) was statistically significant ($R^2 = 0.153, F(1, 216) = 38.794, p < 0.001$). It was found that interest in Western art statistically significantly predicted appreciation for Western artwork ($\beta = 0.86, p < 0.001$). For a one unit increase in interest in Western art, there is a 0.86 unit increase in appreciation

of Western art. The fitted regression model was as follows: Appreciation for Western artwork = $146.26 + 0.86 * (\text{Interest in Western art})$.

The second regression model (*Interest vs Self-relevance western art*) was statistically significant ($R^2 = 0.103$, $F(1, 216) = 24.614$, $p < 0.001$). It was found that interest in Western art statistically significantly predicted self-relevance for Western artwork ($\beta = 0.26$, $p < 0.001$). For a one unit increase in interest in Western art there is a 0.26 unit increase in self-relevance for Western art. The fitted regression model was as follows: Self-relevance for Western artwork = $49.67 + 0.26 * (\text{Interest in Western art})$.

Table 11.

Regression Analysis Western Art Interest

Model	Coefficients	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	
Dependent Variable: Appreciate western art	(Constant)	146.26	5.88		24.84 <0.001
	Interest	0.86	0.14	0.39	6.23 <0.001
Dependent Variable: Self relevance western art	(Constant)	49.67	2.22		22.33 <0.001
	Interest	0.26	0.05	0.32	4.96 <0.001

Comparison of Western vs. Eastern Appreciation Values Related to Void

As the current study was interested in aesthetic experiences linked to void in artwork from a cultural perspective, we further analyzed the appreciation scores of Western and Eastern participants as related to the various levels of presented void (PNG16 values). Table 12 summarizes the descriptive results (Mean, and Std. Deviation) for the Pearson's correlation coefficient of participants between void and appreciation of artwork (more liked, more beautiful, more interesting) as rated by both Eastern and Western participants to the different works of art.

Table 12.*Descriptive Statistics Pearson's correlation between void and art appreciation*

Correlation coefficient	N	Mean	Std. Deviation
Austrian (Western)	112	0.170	0.202
Japanese (Eastern)	104	0.080	0.218
Total	216	0.127	0.214

Table 12 shows the ANOVA results from the comparison of the correlation coefficient among Eastern and Western participants. The results showed there was a statistically significant difference between the two groups with Western participants having a higher mean score (0.17) compared to Eastern participants (0.08). Therefore, as the void increased there was higher appreciation (beauty/liking/interestingness) of the works of art, with Western participants having a higher mean score compared to the Eastern participants. However, this difference not only does not support the hypothesis that void is a stronger determinant of art appreciation for Asian participants, but even is the opposite of what was predicted. Therefore, we did not further analyze this comparison in more detail.

Table 13.*ANOVA Table*

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.430	1	0.430	9.764	0.002
Within Groups	9.430	214	0.044		
Total	9.860	215			

Discussion

Summary

This paper investigated the compositional usage of void in artwork and how the amount of void affects the aesthetic appreciation of individuals from both Western and Eastern cultures when viewing artworks from these respective cultures. The survey focused on an online experiment among Japanese (n = 105) and Austrian (n = 112) participants. A series of stimuli (14 Western and 14 Eastern works of art) were presented to both groups and were rated on 7-point Likert scales for Liking, Meaningfulness, Arousal, Interestingness, and

Aesthetically Moving. Included amongst the 28 works of art were two similar, yet different versions of *The Monk by the Sea* by C.D. Friedrich. Additionally, the Vienna Art Interest and Art Knowledge Questionnaire was applied to assess art interest as it related to ratings of self-relevance. Data analysis revealed no significant differences when it came to the level of void in a given work of art and subsequent appreciation of said artwork. A somewhat noteworthy finding requiring further investigation was that as void increased (lower the level of void, i.e. “more complex” or “less empty”), the more appreciation (more liked, more beautiful, more interesting) of the art by both Eastern and Western participants was reported, though this was not statistically significant. It was, however determined that for Western participants, as the void increased, there even was found higher appreciation (beauty/liking/interestingness) of the works of art, with Western participants having a higher mean score compared to Eastern participants. So, our possible explanation for the strong effects of Friedrich’s “The Monk by the Sea” through void has clearly been falsified.

Regarding the specific investigation of *The Monk by the Sea*, data analysis revealed no significant differences between appreciation (more liked, more beautiful, more interesting) scores of *The Monk by the Sea* with boats and *The Monk by the Sea* without boats. Western participants appreciated (more liked, more beautiful, more interesting) *The Monk by the Sea* with and without boats equally. No significant differences were found. Eastern participants appreciated (more liked, more beautiful, more interesting) *The Monk by the Sea* without and with boats equally. No significant differences were found.

Further, the more the participants were interested in Eastern art or art in general, the more they reported an appreciation for Eastern art (beauty/liking and interestingness score). Similarly, the more the participants were interested in Eastern art or art in general, the more they found it self-relevant. The same results were found for Western participants: The more the participants were interested in Western art or art in general, the more they reported an

appreciation for Western art (beauty/liking and interestingness score). Likewise, the more the participants were interested in Western art or art in general, the more they found it self-relevant.

Within-Cultural Differences

Our research results determined there was not enough evidence to state that one's aesthetic experience related to void is culturally determined. Given the detailed and extensive research that exists on the varying uses of void in artwork based on culture, and the drastic difference in the understanding of void between Western and Eastern cultures in the referenced literature, more pronounced preferences and emotional reactions were expected. It seems therefore valid to conclude that the role of void in artwork needs further exploration and is perhaps more nuanced and reliant on one's own personal preferences outside of cultural identification, i.e., within-culture differences. Perhaps, the effects would be more distinct in more similarly representative samples. While we cannot make any solid inferences based on our statistically insignificant results, the fact that void somehow indicated higher appreciation for *both* Western and Eastern participants, should be a line of questioning that is further analyzed. The use of different measures and different forms of inquiry can further add significant statements to be made about void in artwork.

Eastern vs. Western Participants: Role Reversal

The extensive literature review conducted for the current research indicated that individuals from Eastern cultures have a deeper understanding of voided space in artwork and assign more meaning to such voided space in comparison to their Western counterparts. Therefore, it was unexpected that our analysis revealed that for Western participants, as the void increased within the presented works of art, so did rates of appreciation compared to Eastern participants. As we had no specific hypotheses, we did not further analyze the findings for the different components that built the appreciation scores; these had been

determined by combining the scores of liking, beauty and interestingness. Further breaking down of these scores separately into liking, beauty and interestingness could provide more insight into whether beauty, liking or interestingness stand out as influencing variables or if the values are relatively statistically more or less equal. Additional research is clearly needed to offer more insight into why Western participants appreciated artwork with voided space more than Eastern participants and if any difference in such appreciation can be further determined based on the origin of the viewed works of art (Eastern vs. Western). One hypothesis might be that void is less familiar to the Western perceiver and, as such, more interesting. However, this explanation would not be in accordance with familiarity-linking explanations.

The Monk by the Sea: Still A Partial Anomaly

In reference to our investigation into the two versions of *The Monk by the Sea* (with and without boats), for Eastern and Western participants, there was no statistically significant difference in their ratings of both versions. This needs to be further investigated. As noted in the referenced literature, *The Monk by the Sea* without boats is historically well-known for inciting strong aesthetic reactions amongst its viewers, yet our research has not shown any indication of emotional upheaval related to either version. Further study is needed here, such as bio feedback (EEG, fNIRS), for example, to further illuminate this finding. From the perspective of the current study, it could simply be that *The Monk by the Sea* needs to be approached differently when assessing the viewers aesthetic experience.

Interest Equals Self-Relevance

It was determined that one's interest in Western or Eastern artwork, respectively, did indeed significantly correlate with finding artwork from the respective culture self-relevant. This finding seems logical in the sense that interest would indicate self-relevance, as generally speaking, we can assume that one is mostly interested in things that are applicable

to one's life, especially when they are related to one's culture. Our results indicate this to be true from a statistically significant point of view. Being that we have additional data from Part B and C of the VAIK Vienna Art Interest and Knowledge Questionnaire, it would be of interest to see if any other significant inferences can be determined upon further analysis.

Limitations

While the characteristics of Eastern and Western art are generally agreed upon, there is no denying that styles and techniques shift with time, politics, and historical events, even within a single culture. The chosen artwork varies in terms of the years of conception, and therefore they do not represent a single style of Western or Eastern art. It could be that participants held personal preferences for certain time periods, or that certain time periods simply were more agreeable to the artistic pallet of the viewer.

Selection bias is also likely to be present in the gathering of stimuli, as we did not access a single comprehensive database and instead gathered based on accessibility. Further, the addition of complimentary bio feedback data was initially conceived for this research, at the time when the research plan was created, the Covid situation made testing in the lab infeasible. A future research project using such measures (EEG, fNIRS) would illuminate the current findings and eliminate potential bias. Eye-tracking could also offer valuable insight. It has also been demonstrated that when evaluating eye movements, Eastern and Western individuals distribute attention differently from one another even when viewing the same visual stimuli (Chua et al., 2005). For example, the rate of fixation and where such fixation is placed, i.e. foreground or background, differs between American and Chinese individuals (Chua et al., 2005). Having such data could offer more insight into the current research results. An additional limitation is that our scale to measure art interest and knowledge, i.e., the VAIK Vienna Art Interest Questionnaire, is based on Western art history and exposure to

Western art settings and is therefore less appropriate for non-Western cultures (Specker et al., 2020).

Conclusion

In consideration of the hypotheses, design, and results, this study provides the following central outcomes. First, there is no significant correlation between the values of void and the mean score (beauty, liking, and interestingness) given by the Eastern and Western participants to the different artworks. Second, for Western participants and Eastern participants alike, there was no significant difference between reported appreciation of the two versions of *The Monk by the Sea*. Third, the more the Eastern/Western participants, respectively, are interested in Eastern/Western art or art in general, the higher their appreciation for Eastern/Western art (beauty/liking and interestingness score), respectively, and the more they find it self-relevant. Overall, the findings do not support the initial idea of the study that void in the artwork would determine one's aesthetic experience based on culture. Clearly, one's origin culture is not the strongest determinate of aesthetic experience, and further research is required to better understand the effect of personal preferences when viewing artwork. Further, *The Monk by the Sea*, too, needs to be approached from a different angle to determine if the many reported emotional responses to the empty version are universal, cultural, or nonexistent.

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Supplemental Material

Appendix A: Scatterplots

R-Code for semi-automated data cleaning (additional file)

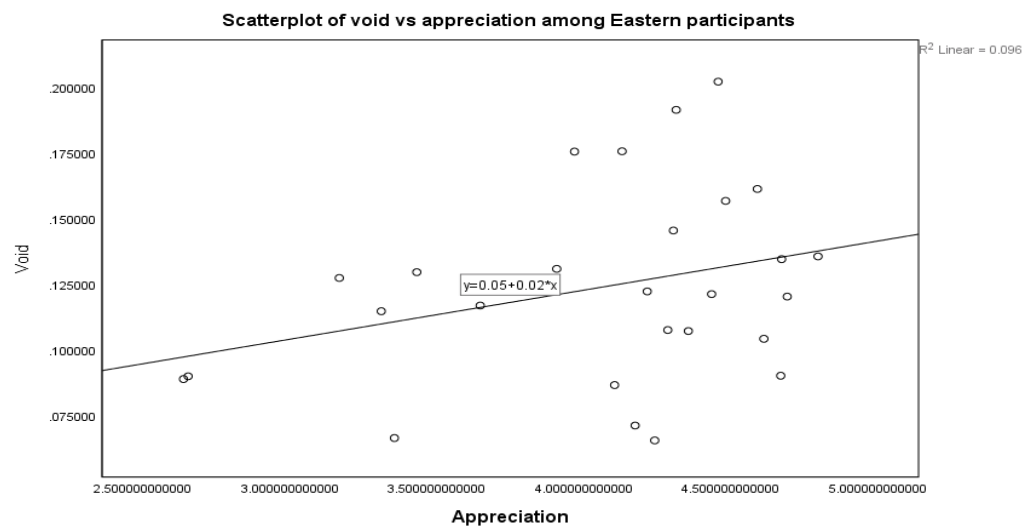
R-Code for data analysis (additional file)

Data (additional files)

Hypothesis (H1a).

Figure 1.

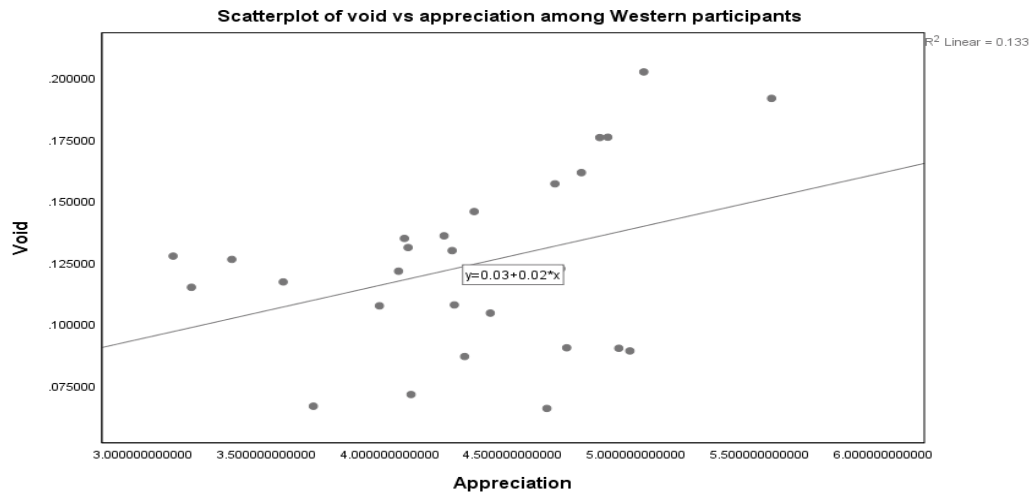
Scatterplot of Void vs Appreciation Among Eastern Participants



Hypothesis (H1b).

Figure 2.

Scatterplot of Void vs Appreciation Among Western Participants



Hypothesis (H3a).

Figure 3.

Scatterplot of Interest vs Appreciation Among Eastern Participants

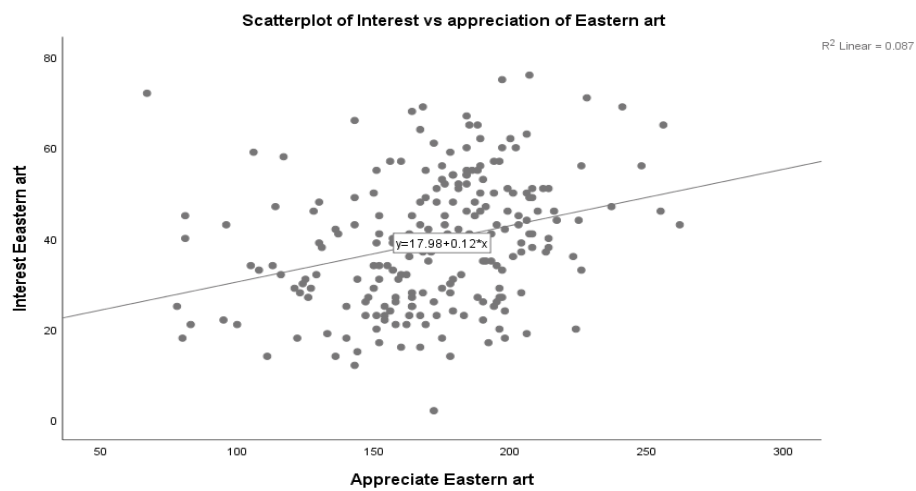


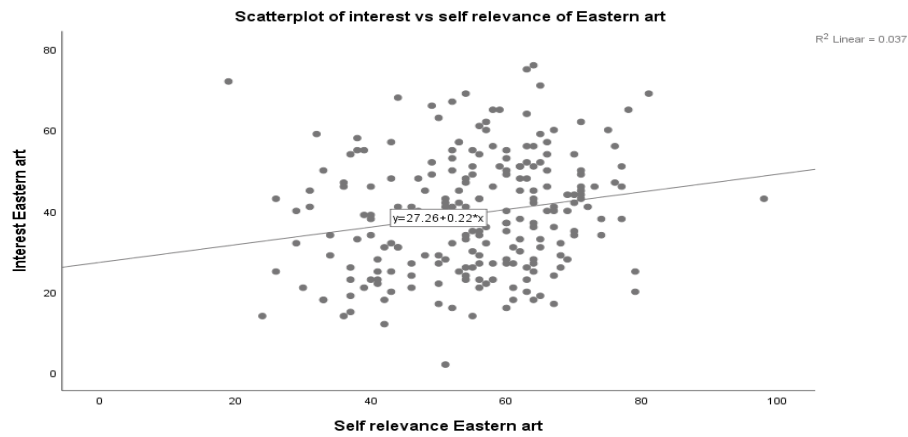
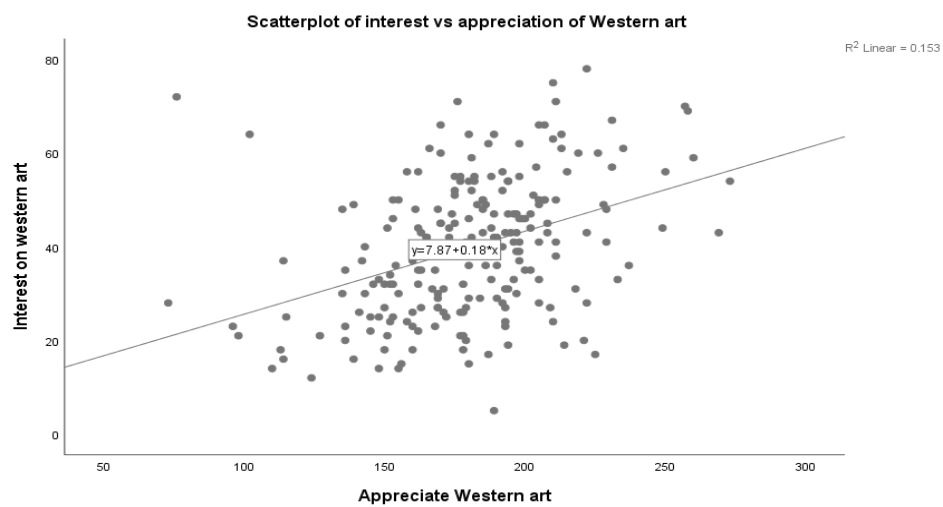
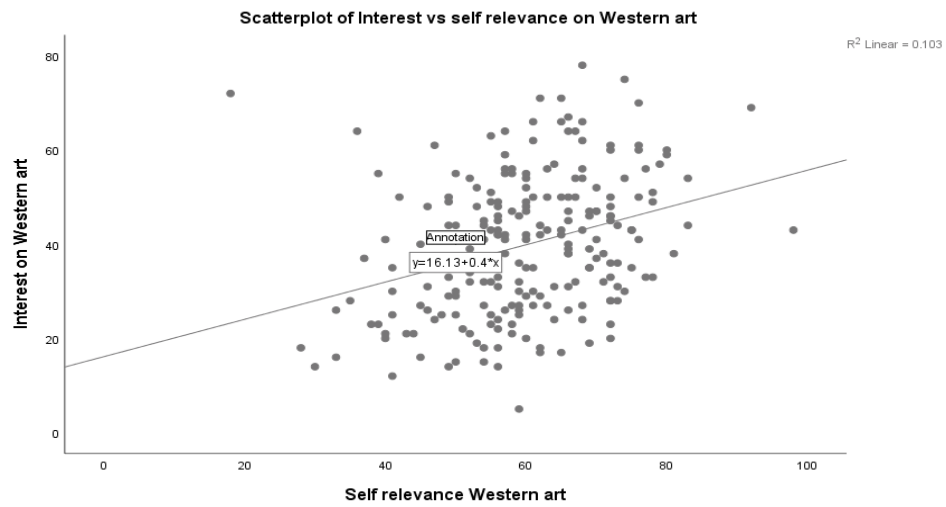
Figure 4.*Scatterplot of Interest vs Self-Relevance Among Eastern Participants**Hypothesis (H3b).***Figure 5.***Scatterplot of Interest vs Appreciation Among Western Participants*

Figure 6.

Scatterplot of Interest vs Self-Relevance Among Western Participants



Appendix B: VAIK Art Interest Scale

Survey Questions/Scales in English, German and Japanese

German	English	Japanese
Ich habe den Kunstunterricht in der Schule gern besucht	I enjoyed visiting art class in school	私は学校の美術の授業を楽しんでいた
Ich unterhalte mich gerne mit anderen Leuten über Kunst	I enjoy talking about art with others	私は美術について人と話すのが好きだ
Ich habe viele Freunde/Bekannte, die sich für Kunst interessieren	I have many friends/acquaintances who are interested in art	私には美術に興味のある友人や知人が多い
Ich interessiere mich für Kunst	I am interested in art	私は美術に興味がある
Ich suche immer wieder neue künstlerische Eindrücke und Erlebnisbereiche	I am always looking for new artistic impressions and experiences	私は新たな芸術的な印象や体験をいつも探している
Im Alltag fallen mir spontan Kunstobjekte auf, die mich faszinieren	During my everyday life I spontaneously notice art objects that I find fascinating	自分を魅了するような美術品の存在について、私は日常生活の中で自然に気づく
Ich komme aus einer kunstinteressierten Familie	I come from a family that is interested in art	私は美術に興味のある家庭に生まれ育った
Wie oft besuchen sie durchschnittlich Kunstmuseen bzw. Kunstgalerien?	How often do you visit art museums or art galleries on average?	あなたは美術館や画廊にどのくらいの頻度で行きますか？
Wie oft lesen Sie Bücher, Zeitschriften oder Kataloge über Kunst?	How often do you read books, magazines or catalogues about art?	あなたは美術に関する本や雑誌やカタログをどのくらいの頻度で読みますか？
Wie oft sehen Sie sich Abbildungen von Kunstwerken an (Bildbände, Internet, etc.)?	How often do you view images of artworks (picture books, internet, etc.)?	画集やインターネットなどで、あなたは美術作品の画像をどのくらいの頻度で見ますか？
Wie oft besuchen sie Veranstaltungen zu Kunst oder Kunstgeschichte (Seminare, Projekte, Festivals, etc.)?	How often do you visit events about art or art history (seminars, projects, festivals, etc.)?	セミナーや企画、催し物など、あなたは美術や美術史についてのイベントにどのくらいの頻度で行きますか？
SCALE	SCALE	SCALE
Gar nicht ○○○○○○○	Not at all ○○○○○○○	全く好ましくない ○○○○○○○
Sehr	Very much	非常に好ましい

Appendix C: Survey Questions

Survey Questions/Scales in English, German and Japanese

German	English	Japanese
Dieses Kunstwerk gefällt mir.	I like this artwork.	私はこの作品が好きだ。
Die Betrachtung diese Kunstwerkes hat eine beruhigende Wirkung auf mich.	Looking at this work of art has a calming effect on me.	この芸術作品を見ると落ち着く。
Ich fand die Betrachtung des Kunstwerkes anregend	I found the artwork stimulating.	この芸術作品は刺激的だと思う。
Dieses Kunstwerk fand ich ästhetisch bewegend, es hat mich durch seinen Inhalt und seinen Stil emotional bewegt.	I found this work of art aesthetically moving, i.e., it moved me emotionally through its content and style.	この作品に美的感動を覚えました。つまり、この作品の内容やスタイルを通じて、私の感情は揺さぶられた。
Meiner Meinung nach ist dieses Kunstwerk interessant.	In my opinion, this work of art is interesting.	この作品は興味深いと思う。
Meiner Meinung nach ist dieses Kunstwerk bedeutungsvoll.	In my opinion, this work of art is meaningful.	この作品は意味深いと思う。
SCALE	SCALE	SCALE
Gar nicht ○○○○○○○ Sehr	Not at all ○○○○○○○ Very much	全く好ましくない ○○○○○○○ 非常に好ましい

Appendix D: Artwork Codes with Titles and Painters

Code	Artist/Source - Name
western_1	<i>The Monk By the Sea</i> , Caspar David Friedrich, recreation by Helmut Leder based on restoration project “The Monk is Back” at Alte National Gallery in Berlin
asian_1	Hokusai, Jewel-River
western_2	Caspar David Friedrich, <i>Monk by the Sea</i> (boats NOT included)
asian_2	Arai Yoshimune – Suma Beach at Night, attributed to Hiroshige
western_3	Joseph Mallord William Turner Lake Lucerne- The Bay of Uri, from Brunnen
asian_3	Kano-Isenin-Naganobu
western_4	A Wheatfield with Cypresses, Vincent Van Gogh
asian_4	Homage to Cézanne” ZAO WOU-KI
western_5	Erinnerung an Mortefontaine’ von Jean-Baptiste-Camille Corot
asian_5	Ma Yuan, Plum-Rock-Stream
western_6	Kirschbäume am Genfersee by Ferdinand Hodler/ Kirschbäume am Genfersee by Ferdinand Hodler
asian_6	Travelers in Mountains, late Ming to Qing dynasty, 1644–1912, Chinese, anonymous
western_7	Landscape by Milan Kacevski
asian_7	Sepia von Gao Jianfu
western_8	Tomorrow by Yves Tanguy
asian_8	Fisherman Hermit Qiu Ying
western_9	A.L. West Birds and Blossoms
asian_9	Birds and Plum by Pu Zuo
western_10	Das Meer bei L’Estaque by Paul Cézanne
asian_10	River Scene by Koho Shoda
western_11	Jean Baptiste Armand Guillaumin
asian_11	Dusk by Koho Shoda
western_12	Starry Night by Van Gogh
asian_12	ChuTeh-Chun, Abstract Landscape Painting
western_13	<i>Koblenz Und Ehrenbreitstei</i> [Oil on canvas] by James Baker Pyne
asian_13	Kiyomi-ga-seki Barrier in Suruga Province by Utagawa Hiroshige
western_14	<i>The institute walk</i> [Oil on canvas by Carl Spitzweg
asian_14	Lower Meguro (Shimo-Meguro), Fugaku sanjûrokkei