

**Pathway from Art to Human Flourishing:  
Exploring the Roles of Immersion and Interest in Engaging with Visual Art?**

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## Abstract

In recent years, the impact of arts and humanities on human well-being has been extensively studied. The present paper focuses on virtual gallery experiences, which have gained popularity during the COVID-19 pandemic. It explores the relationship between viewing virtual artworks and well-being outcomes by examining such mechanisms as immersion in art viewing and interest in artworks. Participants were recruited from a USA representative sample on Prolific, resulting in a final sample of 767 participants. During a 5-week study, participants engaged in a virtual gallery session once a week. In the first week, they were asked about their level of interest in art, and in the following weeks, they reported measures related to their virtual gallery experiences. The findings reveal significant relationships between art immersion and well-being, as well as art interest and well-being. Interestingly, the interaction between art immersion and interest does not significantly influence their impact on well-being. Additionally, higher visit satisfaction is positively associated with well-being. Both art immersion and interest are positively associated with visit satisfaction, but their interaction may have a diminishing effect when both levels are high. Implications for existing knowledge and avenues for future research and practice are discussed.

*Keywords:* visual art, virtual art, flow, immersion, interest, human flourishing, well-being, positive humanities

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## Introduction

*“By art alone we are able to get outside ourselves, to know what another sees of this universe” –*

Marcel Proust (1931, p.160)

Visual art possesses the ability to communicate with us in manners that surpass the limitations of words alone (Hodge, 2022). Visual art has long been recognized for its ability to evoke emotions, stimulate introspection, and provide new viewpoints (Hodge, 2022). Visual art is theorized to contribute to personal growth, creativity, and imagination (D'Olimpio, 2022); foster positive emotions, facilitate social connection and community building, and promote meaning and purpose in life (Lomas, 2018); improve mental health and enhance resilience and coping skills (Gordon-Nesbitt & Howarth, 2022).

In recent years, there has been a significant rise in studies investigating the impact of the arts and humanities, including visual arts, on human well-being and flourishing (Fancourt & Finn, 2019; Shim et al., 2021). Even a new field of Positive Humanities evolved to study the effects of arts and humanities on human flourishing. Human flourishing encompasses a variety of constructs and theories of well-being, such as subjective well-being (Diener et al., 1999), PERMA (Seligman, 2011), psychological well-being (Ryff, 2014), virtues and character strengths (Peterson & Seligman, 2004).

As society continues to evolve, so does the way we engage with art, with the emergence of virtual platforms offering novel opportunities for engagement. The COVID-19 pandemic has had a profound impact on various aspects of our lives, including the way we engage with art and cultural experiences. In response to social distancing measures and limited physical access to galleries and museums, virtual gallery experiences have gained popularity as an alternative means of connecting with art. These digital platforms provide a unique setting where individuals

can immerse themselves in a curated collection of artworks, explore different artistic styles, and engage with interactive elements, all from the comfort of their homes. Therefore, understanding the potential of virtual art experiences and their influence on individuals' well-being is of particular relevance in today's world. In this paper, I explore the process of engaging with art through viewing paintings in a virtual gallery.

Research has emphasized the role that the viewing context plays in the engagement with art, as demonstrated by various studies. For example, one study showed that the context of viewing the art gallery, such as in the museum or digitally in the laboratory, plays a significant role in the appreciation of art, influencing the overall art experience and the time spent on art (Brieber et al., 2014). Furthermore, engaging in mindfulness techniques during art engagement can lead to a more profound and meaningful encounter with the artwork (Zabelina et al., 2020). These findings highlight the importance of considering contextual mechanisms as a crucial factor in engaging with art.

Thus, building on the research demonstrating a positive association between visual art engagement and well-being, we can further explore the contextual mechanisms through which visual art engagement can be optimized to facilitate well-being. The present study seeks to explore the relationship between viewing virtual artworks and well-being outcomes by examining the mechanisms involved, such as immersion in art viewing and interest in artworks, to offer insights relevant to both art institutions and individuals seeking meaningful cultural engagement.



## Literature Review

### Theoretical Background

#### *Positive Psychology*

Positive psychology, introduced by Seligman and Csikszentmihalyi (2000), focuses on studying the factors contributing to human flourishing and well-being. Seligman (1999), in his capacity as the president of the American Psychological Association, described the goal of positive psychology as exploring the factors that contribute to healthy families, satisfying work environments, and strong civic commitment. He noted that while psychology has made progress in understanding how people cope with adversity, there is a significant gap in knowledge about how individuals thrive under favorable conditions. This is due to the focus of psychology since World War II, which has primarily been on healing and addressing pathology. The emphasis on pathology has resulted in neglecting to study flourishing and positive aspects of human experience (Seligman, 1999).

As a new field, positive psychology studies subjective experiences: well-being, contentment, and satisfaction (in the past); hope and optimism (for the future); and flow and happiness (in the present) (Seligman & Csikszentmihalyi, 2000). Positive psychology does not imply that the rest of psychology is negative (Gable & Haidt, 2005); it recognizes an imbalance in clinical psychology, which primarily focuses on mental illness, while other branches of psychology have a more balanced perspective.

Even though positive psychology has started exploring what makes life worth living, people have pondered the essence of a fulfilling life and how to maximize its value over the centuries (Peterson, 2006). Two main perspectives have emerged: the hedonic and the eudaimonic views (Ryan & Deci, 2001). The hedonic view, derived from the Greek word for

pleasure, emphasizes positive emotions, life satisfaction, and reduced negativity (Deci & Ryan, 2006). The hedonic approach views the human organism as initially empty and shaped by social and cultural influences to gain meaning and purpose (Deci & Ryan, 2006). In contrast, the eudaimonic approach recognizes inherent content within human nature and aims to discover and understand that content, as well as the factors that support or hinder it (Deci & Ryan, 2006). The eudaimonic perspective of well-being emphasizes living in alignment with one's true self (Waterman, 1993). Thus, eudaimonia is achieved when individuals' life activities align with their core values and involve complete engagement through meaning, personal growth, and excellence. Based on previous work of philosophers and thinkers, positive psychology established itself as a scientifically rooted discipline, employing the scientific method to ensure evidence-based ways of creating and cultivating more of what supports human thriving (Peterson, 2006).

Seligman (2011) presented the PERMA model of well-being, which includes five distinct elements pursued for their own sake: positive emotions, engagement, relationships, meaning, and accomplishment. In this capstone, I will focus on the engagement part of the PERMA model and explore the importance of engagement in art viewing for well-being. Engagement encompasses flow, which refers to optimal experience where one's actions and awareness blend, leading to enjoyment without conscious focus on oneself, time, or emotions (Seligman, 2011).

### ***Flow Theory***

Flow is characterized as an optimal experience of enjoyable, deep, and effortless involvement (Csikszentmihalyi, 1990). According to Csikszentmihalyi (1990), flow occurs when there is a perfect balance between the level of challenge presented by the task and the individual's skills or abilities. In this state, individuals experience a deep sense of enjoyment and

fulfillment as they are fully absorbed in the present moment, losing track of time and self-consciousness.

Flow is typically associated with certain key characteristics: a clear goal, a high level of concentration, a loss of self-awareness, a sense of control over the activity, a merging of action and awareness, a distorted sense of time, and a deep sense of intrinsic motivation (Csikszentmihalyi, 1990). Thus, flow requires concentrated psychic energy directed to the current short-term goal and moment. It does not happen by chance; it can be developed. Such unique experiences elevate the self to a new level of understanding, filling life with joy, a feeling of control, and a satisfying sense of the present (Csikszentmihalyi, 1990).

Csikszentmihalyi and Robinson (1990) found that the state of mind described by philosophers as the aesthetic experience and by psychologists as flow experiences are likely to be fundamentally similar.

### ***Positive Humanities***

Positive Humanities is an emerging field that explores the connection between art, culture, and human flourishing (Pawelski, 2022). It investigates how cultural engagement can positively impact well-being and aims to optimize this engagement for individual and community thriving. By eudaimonic turn, Pawelski (2022) emphasizes that the Positive Humanities promote a shift in the humanities towards prioritizing human flourishing as a key focus and goal. This involves recognizing and committing to the exploration of human well-being as a central theme within the humanities.

The Positive Humanities has significant implications for a positive psychology practice. Practitioners can use the art and humanities disciplines to help individuals cultivate positive emotions, enhance their social connections, and develop virtues that contribute to well-being

(Tay & Pawelski, 2022). The Positive Humanities can be used in community settings to promote a culture of well-being and flourishing (Pawelski, 2022). The present study will focus on individual human flourishing and well-being outcomes.

A conceptual framework was proposed that hypothesizes the effects of the arts and humanities on possible human flourishing outcomes. It identifies five psychological mechanisms: Reflection, Acquisition, Immersion, Socialization, and Expression, referred to as the acronym RAISE, through which human flourishing outcomes can be reached (Shim et al., 2019; Tay et al., 2018; Thapa et al., 2023). These outcomes include physiological (e.g., cardiovascular, endocrine), psychological (e.g., self-efficacy, creativity), general well-being (e.g., subjective well-being), and positive normative (e.g., moral compass, civic engagement) effects. More empirical research is needed to build on this theoretical framework to provide evidence for the mechanisms of the arts and humanities affecting human well-being outcomes.

In the RAISE model, immersion is defined as bringing a person into direct and instant involvement with the arts and humanities that enables him to be carried away and dispatched from the current situation (Tay & Pawelski, 2022). It is important to note that immersion is also regarded as a first step in awakening other parts of the RAISE model, such as Reflection, Acquisition, Socialization, and Expression (Tay et al., 2018). Thus, by immersing himself first, the person obtains the fundamental key to engaging with the arts and humanities in a meaningful way that may augment his well-being through other psychological mechanisms. The present study explores the relationship between immersion and well-being in the context of a virtual art gallery experience.

### *Visual Art Engagement and Well-being*

Numerous theoretical models support the notion that engaging with visual art benefits overall well-being. De Botton and Armstrong (2020) assert that art, including visual art, has the power to address psychological challenges and enhance well-being. It serves as a remedy for forgetting, instills hope, combats isolation, restores balance, facilitates self-discovery, enriches experiences, and restores sensitivity.

Regarding positive emotions, Schneider and Fredrickson (2019) suggest that contemporary art, including visual art, can be a powerful means of cultivating and transmitting positive emotions. The authors argue that positive emotions can be intentionally developed through art, which has important implications for promoting well-being and positive social change. Additionally, Westgate and Oishi (2022) suggest that art, including visual art, is linked to higher psychological well-being directly through enjoying the current pleasurable moments and indirectly by capitalizing on future psychological well-being.

In terms of the mechanisms of engaging with art, Jacobsen (2006) theorized that the nature of aesthetic experiences in art is influenced by various factors such as the characteristics of the artwork, the viewer's personal traits, emotional and motivational states, knowledge about art, past experiences, and the viewing context. These factors, as shown in Figure 1, contribute to the unique and diverse ways in which individuals engage with visual art.

**Figure 1***The Framework for the Psychology of Aesthetics*

*Note.* Adapted from “Bridging the arts and sciences: A framework for the psychology of aesthetics”, by T. Jacobsen, 2006, *Leonardo*, 39(2), p. 155–162,

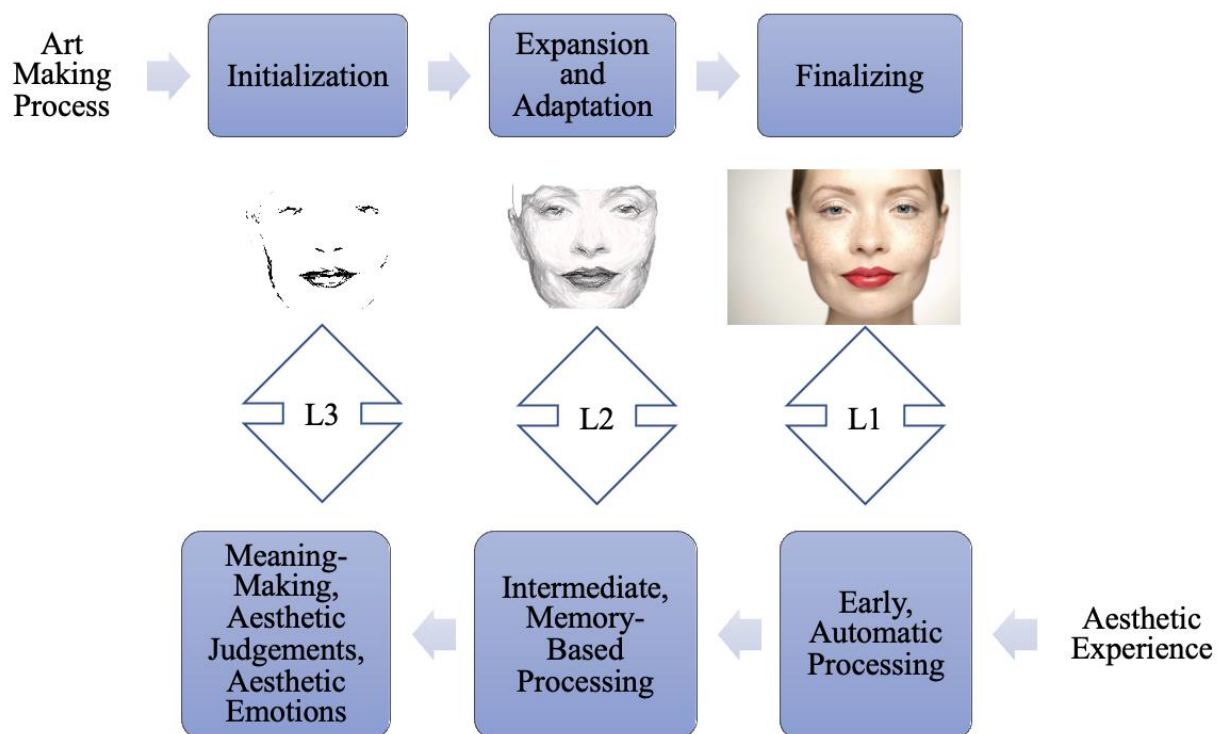
<https://doi.org/10.1162/leon.2006.39.2.155>

Another model that explains the mechanism of experiencing art is called the Mirror Model by Tinio (2013). It connects two sides of the process – art making and art viewing. According to this model, the aesthetic encounter with an artwork can be divided into three levels, as illustrated in Figure 2. At Level 1 Correspondence (L1), the viewer focuses on the visual elements of the artwork, such as color, texture, and brightness, that correspond to the finalizing stage of art-making. Moving to Level 2 Correspondence (L2), the viewer starts to process the objects, figures, and overall composition depicted in the artwork. This level involves the artist's refinement during the art-making process. The most significant level, Level 3 Correspondence

(L3), represents a deep engagement with the artwork. It serves as the interface between the initial motivation behind the artwork and the viewer's late processing stage, which includes complex cognitive processes like deriving meaning, experiencing aesthetic emotions, and making aesthetic judgments. It can be suggested that moving to L3 would necessitate immersion as it involves having a clear goal, maintaining high levels of concentration, losing self-awareness, merging action and awareness, and experiencing a distorted sense of time. This theoretical model is helpful in understanding relevant mechanisms that can facilitate our engagement with visual art.

**Figure 2**

*The Mirror Model of Art*



*Note.* Adapted from "From artistic creation to Aesthetic Reception: The mirror model of art", by P. P. Tinio, 2013, *Psychology of Aesthetics, Creativity, and the Arts*, 7(3), p. 266.

<https://doi.org/10.1037/a0030872>

## **Empirical Studies**

### ***Visual Art Engagement and Well-being***

Empirical evidence provides support for the earlier theoretical claims by showing associations between art viewing and well-being outcomes. For clinical populations, it includes enhanced mental well-being for stroke patients with extended hospital stays (Baumann et al., 2013), decreased depression levels and improved memory for individuals with dementia (D’Cunha et al., 2019). Other findings suggest that artworks have a positive impact on patients’ moods and provide coping mechanisms for mental and physical health conditions, although further research on various art practices in hospital settings is necessary to deepen our understanding (Timonen & Timonen, 2021).

For non-clinical populations, the act of engaging with art through viewing paintings has been associated with a range of positive physiological outcomes, including a lowered stress level (Law et al., 2021), reduced cortisol concentration (Clow & Fredhoi, 2006), decreased blood pressure (Mastandrea et al., 2018), and a reduced risk of mortality from external causes (Vaananen et al., 2009). In terms of psychological well-being, a reduction in anxiety levels (Binnie, 2010) and an increase in subjective well-being (Wheatley & Bickerton, 2017) were reported. For older adults, the findings imply higher levels of life satisfaction and autonomy and lower odds of depression and dementia (Fancourt et al., 2018; Fancourt & Steptoe, 2019; Tymoszuk et al., 2020). These findings suggest that engaging with the arts is important for overall well-being throughout the lifespan.

In terms of the mode of art engagement, the positive effects of in-person visual art engagement on well-being have been studied and supported by evidence mentioned earlier. A review commissioned by the World Health Organization in 2019, which analyzed over 900



publications, highlighted the meaningful impacts of participating in artistic and cultural activities, including visiting art galleries in-person (Fancourt & Finn, 2019). However, further investigation is needed to better understand the potential well-being effects of online engagements.

### ***Virtual Visual Art Engagement and Well-being***

A limited number of studies revealed the well-being effects associated with engaging art galleries online. For clinical populations, individuals with dementia have benefited in terms of well-being outcomes cognitively, behaviorally, emotionally, and in their relationships from the art viewing process through touchscreens (Tyack et al., 2015).

In terms of non-clinical populations, several studies suggest that participants exposed to online art exhibitions experienced improvements in negative mood, anxiety, loneliness, and overall subjective well-being (Trupp et al., 2022; Trupp et al., 2023). Another study by Cotter et al. (2022) revealed that, after the repeated virtual gallery visit, the level of immersion experienced during the virtual gallery visits was associated with changes in certain aspects of flourishing, such as engagement, meaning, and autonomy satisfaction. In another study, Cotter et al. (in press) found that increased levels of immersion were linked to positive well-being and emotional outcomes, including higher levels of positive emotions after the virtual art gallery visit. Also, it was found that looking at beautiful paintings online reduced pain ratings (de Tommaso et al., 2018).

### ***Mechanisms Facilitating Well-being Outcomes***

**Overview.** Given the association between art engagement and well-being outcomes, the next logical step would be to empirically explore the mechanisms that explain or facilitate this relationship.

Even though these individual mechanisms have yet to be extensively studied, some of the mechanisms include mood, aesthetic responsiveness, appreciation of beauty, immersion, and interest in artworks. For example, a study by Trupp et al. (2022) indicated that the changes in well-being were primarily driven by improvements in negative mood, and these improvements were associated with aesthetic appraisals and cognitive-emotional experiences during the art exhibition. Another study confirmed that individual differences in aesthetic responsiveness predicted the benefits of online art viewing on well-being (Trupp et al., 2023). Also, findings suggest that an individual trait like the appreciation of beauty can be a construct that positively impacts individual well-being (Martínez-Martí et al., 2016; Martínez-Martí et al., 2018).

**Visual Art Immersion.** Visual art experiences can range from superficial engagements to deep, immersive encounters. Immersion as a mechanism of viewing visual art refers to the state of being deeply engaged, absorbed, and focused by losing track of time, being captivated by the artwork, and feeling a sense of connection or flow (Shim et al., 2019; Tay et al., 2018; Thapa et al., 2023).

Thapa et al. (2023) theorized that immersion contains three dimensions: the passage of time, effortless involvement, and loss of self-consciousness. According to their study, the passage of time during engagement in arts was not consistently associated with flourishing outcomes, while effortless involvement consistently predicted well-being. This suggests that the feeling of time standing still during art engagement may be more related to immediate physiological and psychological reactions rather than long-term well-being outcomes.

Wanzer et al. (2020) provides support for the idea that the aesthetic experience from viewing art can be considered a form of flow experience, as proposed by Csikszentmihalyi and Robinson (1990). The authors suggest that considering the aesthetic experience as a flow

experience can expand the understanding of activities in which individuals can achieve flow, and it encourages further research within Csikszentmihalyi and Robinson's framework (1990) of the aesthetic experience. The present study will contribute to the increasing body of knowledge examining immersion as a relevant mechanism in supporting well-being through art engagement.

Three studies have examined the impact of slow-looking, dedicating a prolonged duration to observing and examining a single artwork as a practice for visual art immersion in an online context. One study showed that participants reported feeling more pleasant and relaxed after the engagement (Igdalova & Chamberlain, 2023). The study by Cotter et al. (2022) included varying viewing instructions aimed at increasing immersion. Participants were randomly assigned to one of nine experimental conditions, including different combinations of slow-looking and immersive mindset framing instructions. There were different sets of framing instructions, such as mindful looking, which emphasized being fully aware of the viewing experience, curious looking, which encouraged generating questions about the artist and art, and social looking, which involved relating the artwork to personal relationships. Although immersion levels were higher in the viewing conditions compared to the reading condition, there were no significant differences in flourishing across the conditions. The study by Cotter et al. (in press), despite the unsuccessful attempts to induce greater immersion through mindful and curious slow-looking, revealed that higher levels of immersion were associated with higher levels of post-visit positive emotions and seemed to act as a protective factor for certain negative emotions, such as sadness, irritability, and anger. Participants who reported higher levels of negative emotion before the visit tended to have lower levels of negative emotion after the visit if they were more immersed in the experience, compared to those who were less immersed (Cotter et al., in press). Based on

the earlier findings by Thapa et al. (2023), the effect of slow-looking facilitating immersion might not be observed due to the fact that it is more likely to impact immediate well-being outcomes rather than longer-term well-being outcomes.

**Visual Art Interest.** Several studies have demonstrated the significant influence of art interest or expertise on our engagement with visual art. In terms of experience, experienced artists perceive more information from paintings based on their knowledge and experience compared to art novices (Koide et al., 2015). This difference is evident in their eye scan paths while viewing paintings, even in the absence of figurative objects (Koide et al., 2015).

In terms of individuals' academic training, art expertise might influence how they derive meaning from the artwork. The study by Fróis and Silva (2013) showed that those with a background in the arts demonstrate a more precise and detailed approach, using art-specific terminology, whereas non-artists are more concise and focused on the instrumental aspects of meaning-making. This suggests that academic training has a subtle impact on individuals' engagement with and interpretation of the artwork.

Also, when examining viewers' art expertise, one study found that expertise correlated with understanding but not liking the artwork (Mullennix & Robinet, 2018). In contrast, other studies found that experts not only had higher levels of liking for all artworks but they also found them more understandable and emotionally engaging than non-experts (Leder et al., 2006; Leder et al., 2012).

The study by Specker et al. (2017) provides evidence indicating that the Mirror Model described earlier accurately reflects the natural art processing mechanisms employed by individuals during art making and art viewing. These findings can be attributed to Cupchik and Laszlo's (1992) discovery, which revealed that individuals with limited art expertise tend to

employ a content-based processing strategy, while experts tend to adopt a style-oriented processing approach (Specker et al., 2017). Both processes can happen in L2 in line with the Mirror Model (see Figure 2).

There are different types of art interest or expertise measurements in the field of empirical aesthetics, such as the Aesthetic Fluency Scale (Smith & Smith, 2006), Assessment of Art Attributes (Chatterjee et al., 2010), Vienna Art Interest Art Knowledge (VAIAK; Specker et al., 2020), and different self-report measures. In the present study, the art interest part of the VAIAK scale was used to measure the interest of participants in artworks. This measurement is used as a reliable and validated tool that provides a clear conceptual framework for understanding art interest.

### **The Present Study**

The present study seeks to contribute to the growing body of knowledge investigating the roles of art immersion and interest as facilitating mechanisms for well-being outcomes in a virtual art gallery context. I hypothesize that both art immersion and art interest will be positively associated with well-being, indicating that individuals who experience a greater sense of immersion and a higher level of interest in artworks will report higher levels of well-being in the virtual art gallery setting. Furthermore, I aim to explore the relationship between art immersion, interest, and visit satisfaction. Visit satisfaction represents individuals' subjective evaluation of their virtual gallery experience and their level of fulfillment with the overall encounter. I hypothesize that both art immersion and art interest will positively contribute to visit satisfaction, reflecting the idea that prior art interest and immersive art experience are more likely to result in higher levels of satisfaction. Lastly, I explore the relationship between visit satisfaction and well-

being. The present study, which utilizes a longitudinal dataset collected over a period of five weeks, has received approval from the Institutional Review Board.

## **Method**

### **Participants**

#### ***Initial Screening***

The study used a sample of 2000 participants recruited from Prolific. The sample was representative of the United States adult population, taking into account factors like gender, age, and race. This representative sample was ensured using Prolific's representative sampling tools, which stratify the intended sample size using the US Census Bureau's data for precise demographic representation. Participants were paid \$0.85 for the initial screening session.

#### ***Procedures***

Participants provided informed consent and then completed a brief demographic questionnaire before proceeding to a short visit to a virtual art gallery. The participants were given three minutes to spend within the virtual gallery. To initiate the gallery experience, participants clicked on a thumbnail within the survey to expand the virtual gallery to full-screen. Navigating through the gallery involved using the arrow keys on the keyboard and manipulating the mouse to adjust the viewpoint. Participants had the option to enlarge specific artworks by clicking on them and were instructed to make their favorite artwork full-screen by selecting it.

#### ***Invitation to Main Study***

In order to qualify for the study, participants had to meet certain inclusion criteria. These criteria included being able to enter the virtual gallery in full screen mode, navigating through the gallery for a minimum duration of 90 seconds, and visiting both rooms within the gallery. Out of 2000, a total of 1479 participants met these criteria and were invited to the main study.

## Main Study

A total of 1479 participants from the screening study were invited to take part in the main study, with 1200 participants enrolling. Participants received compensation of \$5 for each of the five sessions and a \$5 bonus for completing all five sessions. In order to be included in the final sample, participants had to meet several criteria. These included demonstrating low scores on measures of inconsistent and directed responding to ensure attentiveness and completing at least three valid experimental sessions.

The final sample consisted of 767 participants who met all the inclusion requirements (see Table 1). The majority of participants were White (80.27%), middle-aged ( $M = 46.92$ ,  $SD = 14.8$ ), female (51.37%), and had a Bachelor's degree or higher education level (60.89%).

**Table 1**

### *Sociodemographic Information*

Baseline characteristic	Final Sample (n=767)
Age	$M = 46.92$ , $SD = 14.8$ , $Range = 18-79$
Race	American Indian = 1.56% Asian = 6.12% Black or African American = 11.88% Hispanic, Latino, or Spanish origin = 5.21% Middle Eastern or North African = 0.65% White = 80.27% Other = 0.91%
Gender	Female = 51.37% Male = 47.20%, Other = 1.43%
Education	Did not finish HS = 0.13% HS = 9.12% College, no degree = 20.21% Associates = 9.65% Bachelors = 36.51% Masters = 19.43% Doctoral/Professional = 4.95%

## **Data Collection**

### ***Gallery Information***

The virtual gallery from Cotter et al. (2022) was utilized in the study that was constructed using the Open Gallery for Arts Research (OGAR) tool. This software allowed for the customization of gallery layouts and the presentation of interactive art images. Throughout data collection, participants' behaviors within the gallery, such as their location, viewed artworks, engagement with individual works in full screen mode, and time spent in the gallery, were tracked and recorded for subsequent analysis.

**Screening.** For the initial screening session, a two-room gallery was created, showcasing 10 artworks that were not included in the main study galleries. The selected artworks encompassed a variety of styles and content. Detailed information about participants' time within the gallery, the duration of each artwork viewed, the artwork that received the longest viewing time, and the specific duration of the most viewed artwork was obtained from OGAR. Additionally, the average time spent viewing individual artworks and the total time spent viewing art compared to non-art elements, such as the gallery walls, floor, or ceiling, were calculated.

**Main study.** From Cotter et al. (2022), the galleries in the study were created using OGAR, featuring a consistent layout of four rooms. Each gallery included 30 artworks selected from a pool of 161 artworks. The details of the artworks used in each gallery can be found in Cotter et al. (2022). Various measurements were collected for each gallery that allowed for calculations of the average time spent looking at individual artworks and the total time spent viewing art versus non-art elements in the virtual gallery, such as the walls, floor, or ceiling. Each week, a different gallery was presented to participants to introduce new artworks.



**Artwork Selection.** The study utilized a sample of 161 artworks from the Philadelphia Museum of Art (PMA) catalog, selected through a process that involved collecting 5,488 paintings initially and applying exclusions based on specific criteria. To ensure diverse visual content, computer vision-based descriptions and an algorithmic sampling procedure were employed, utilizing a neural network model (VGG16) for quantitative descriptions and a genetic algorithm for selecting a subset of 180 paintings. The final sample of 161 images was manually screened for individual works. More details can be found in Cotter et al. (2022).

### ***Procedures***

The study spanned a duration of 5 weeks, with participants engaging in one session per week. In the first week, participants underwent assessments to establish their baseline flourishing levels and provided information about their individual differences, such as art interest. Each week participants were involved in sessions and completed measures related to their experience during each respective week.

### ***Measures***

**Well-being.** After each virtual gallery visit, the Brief Inventory of Thriving (BIT; Su et al., 2014) was used to measure the psychological well-being of participants. Comprising 10 items, the BIT evaluates a wide spectrum of positive psychological functioning and wellness factors. Participants responded on a 5-point Likert scale ranging from 'Strongly disagree' to 'Strongly agree'. For BIT,  $\omega_{\text{within}}$  was 0.70, and  $\omega_{\text{between}}$  was 0.97, calculated using the *misty* package (Yanagida, 2023) in R Statistical Software (v4.2.3; R Core Team 2023)

**Visit Satisfaction.** After each virtual gallery visit, participants were asked to gauge their overall level of satisfaction with the experience. The five-point scale was as follows: 'Extremely

dissatisfied' (1), 'Somewhat dissatisfied' (2), 'Neither satisfied nor dissatisfied' (3), 'Somewhat satisfied' (4), and 'Extremely satisfied' (5).

**Immersion.** After each virtual gallery visit, participants were asked to fill out a four-item measure of immersion. This measure assessed their level of absorption in the experience, whether they lost track of time, were engrossed in their thoughts, concentrated on the artwork, and felt rewarded by the experience. Participants responded on a 7-point Likert scale from 'Strongly disagree' to 'Strongly agree', following the theoretical definition of the immersion mechanism (Tay et al., 2018; Thapa et al., 2023). For immersion,  $\omega_{\text{within}}$  was 0.76 and  $\omega_{\text{between}}$  was 0.94 calculated using the *misty* package (Yanagida, 2023) in R Statistical Software (v4.2.3; R Core Team 2023)

**Interest.** VAIK (Specker et al., 2020) was employed as an innovative method to evaluate the general art interest and knowledge of participants. VAIK comprises two separate scales (Art Interest and Art Knowledge), with all items equally contributing to a total score per scale – here, I only used the Art Interest scale and collected it during the first week. The Art Interest scale (11 items) consists of subjective interest items (e.g., "I enjoy discussing art with my friends and family"; seven items) and art-interested behavior items (e.g., "How frequently do you typically visit art museums?"; four items). Each of these is scored on a 7-point scale: subjective interest items are rated from 1 (not at all) to 7 (very much), while behavioral items are rated from 1 (less than once a year) to 7 (once a week or more often). The estimated reliability of the VAIK was high ( $\alpha = 0.92$ ), indicating strong reliability of the instrument in assessing participants' art interest levels. For the calculation of the reliability, I used the *psych* package (Revelle, 2023) in R Statistical Software (v4.2.3; R Core Team 2023).

## Results

### Descriptive Statistics

Descriptive statistics for immersion, BIT, and visit satisfaction are available in Table 2, calculated using the *multilevelTools* package (Wiley, 2020) in R Statistical Software (v4.2.3; R Core Team 2023). Noting that they have been collected each week for 767 individuals, multilevel descriptive statistics were examined to understand their variation in mean scores attributable to within-individual and between-individual factors. The intraclass correlation coefficient (ICC) for immersion was 0.63, indicating that 63% of the variability in people's immersion responses can be attributed to person-level factors. In contrast, this coefficient for BIT and visit satisfaction was 0.86 and 0.52, respectively. VAIK ( $M = 44.99$ ,  $SD = 14.11$ ) has only been calculated once in the first week.

**Table 2**

#### *Multilevel Descriptive Statistics*

	<i>M</i>	<i>SD</i> within cluster	<i>SD</i> between cluster	ICC
Immersion	5.33	0.83	1.08	0.63
BIT	3.51	0.36	0.88	0.86
Visit Satisfaction	4.29	0.62	0.64	0.53

*Note.* ICC = Intraclass correlation coefficient.

Within-group and between-group correlational matrix calculated using the *misty* package (Yanagida, 2023) in R Statistical Software (v4.2.3; R Core Team 2023) is presented in Table 3.

**Table 3***Within-Group and Between-Group Correlation Matrix*

	Between	1	2	3
Within				
1. Immersion		-	0.22	0.84
2. BIT		0.16	-	0.21
3. Visit Satisfaction		0.54	0.11	-

**Inferential Statistics**

To explore different relationships between art interest, immersion, visit satisfaction, and well-being, I run multilevel regression models using the *lme4* package (Bates et al., 2015) and *lmerTest* package (Kuznetsova et al., 2017) in R Statistical Software (v4.2.3; R Core Team 2023). Please see Tables 4 and 5.

***Does Art Immersion Predict Well-Being?***

In Model 1 (see Table 4), I first examined the relationship between art immersion as an independent variable and well-being as a dependent variable. The analysis revealed a statistically significant positive association between art immersion and well-being. This signifies that an increased level of immersion corresponds with higher levels of well-being.

***Does Art Interest Predict Well-Being?***

In Model 2 (see Table 4), I examined the relationship between art interest as an independent variable and well-being as a dependent variable. The relationship between art interest and well-being was also found to be statistically significant. This indicates that higher interest levels are associated with higher well-being.

### ***Do Art Interest and Immersion Jointly Predict Well-Being?***

In Model 3 (see Table 4), I examined the relationship between art interest, immersion, and their joint interaction factor as independent variables and well-being as a dependent variable. The interaction effect of immersion and interest on well-being was not statistically significant, whereas their single factor predictors remained statistically significant. This implies that interest does not significantly moderate the relationship between immersion and well-being and vice versa.

### ***Does Visit Satisfaction Predict Well-Being?***

In Model 4 (see Table 4), I examined the relationship between visit satisfaction as an independent variable and well-being as a dependent variable. The analysis indicates a significant positive relationship between visit satisfaction and well-being. This suggests that individuals with higher levels of visit satisfaction also demonstrated higher levels of well-being.

**Table 4**

#### *Predicting Well-being*

	Estimate ( <i>b</i> )	<i>SE</i>	<i>p</i>
Model 1			
Immersion	0.08	0.01	<.001
Model 2			
Interest	0.01	0.00	<.001
Model 3			
Immersion	0.06	0.03	.016
Interest	0.01	0.00	.031
Immersion * Interest	0.00	0.00	.570
Model 4			
Visit Satisfaction	0.08	0.01	<.001

### ***Does Art Immersion Predict Visit Satisfaction?***

In Model 5 (see Table 5), I examined the relationship between art immersion as an independent variable and visit satisfaction as a dependent variable. Immersion level and visit

satisfaction were found to have a statistically significant positive relationship. As immersion levels rise, visit satisfaction is also likely to increase.

***Does Art Interest Predict Visit Satisfaction?***

In Model 6 (see Table 5), I examined the relationship between art interest as an independent variable and visit satisfaction as a dependent variable. The study also demonstrated a statistically significant positive association between interest level and visit satisfaction. Hence, the higher the interest level, the greater the visit satisfaction.

***Do Art Interest and Immersion Jointly Predict Visit Satisfaction?***

In Model 7 (see Table 5), I examined the relationship between art interest, immersion, and their joint interaction factor as independent variables and visit satisfaction as a dependent variable. Interestingly, the interaction between immersion and interest had a statistically significant relationship with visit satisfaction, whereas their single factor predictors also remained statistically significant. However, the negative sign of this interaction suggests a potential diminishing effect on visit satisfaction when both immersion and interest are high.

**Table 5**

*Predicting Visit Satisfaction*

	Estimate ( <i>b</i> )	<i>SE</i>	<i>p</i>
		Model 5	
Immersion	0.44	0.01	<.001
		Model 6	
Interest	0.02	0.00	<.001
		Model 7	
Immersion	0.51	0.03	<.001
Interest	0.01	0.00	.024
Immersion * Interest	-0.00	0.00	.015

## Discussion

### Interpretation of Findings

In this study, I explored the relationship between immersion during art viewing, interest in visual art, visit satisfaction, and well-being within the unique setting of a virtual gallery experience. Recognizing the novelty of this virtual format and its implications in light of the COVID-19 pandemic, I aimed to understand the potential of immersion during art viewing and interest in visual art to promote human flourishing outcomes such as well-being and visit satisfaction.

The findings indicated significant relationships between immersion during art viewing and well-being, as well as between art interest and well-being. These results suggest that both immersion and interest in art are positively associated with higher levels of well-being. However, the interaction between immersion and interest did not significantly moderate the relationship with well-being, indicating that interest does not influence the impact of immersion on well-being and vice versa.

Moreover, visit satisfaction was found to be positively associated with well-being, indicating that individuals who reported higher levels of satisfaction with their virtual gallery experience also demonstrated higher levels of well-being. Additionally, both art immersion and art interest were positively associated with visit satisfaction. However, the interaction between immersion and interest showed a negative relationship with visit satisfaction, suggesting a potentially diminishing effect on visit satisfaction when both immersion and interest levels are high.

These findings underscore the importance of considering immersion during art viewing and art interest in understanding individuals' experiences with art and their subsequent well-

being and visit satisfaction. While immersion and interest individually contribute to positive outcomes, their joint influence may have complex dynamics that require further exploration. Future research should delve deeper into the interplay between immersion and interest to better understand their combined effects on visit satisfaction and well-being.

Also, the virtual gallery experience presented a distinct and less explored context for art immersion and interest. Unlike traditional in-person encounters, the virtual format allowed for the integration of interactive elements such as navigating the virtual gallery, personalized engagement with the artwork through a computer, and the potential for transcending physical limitations. This unique setting offered an opportunity to examine the impact of virtual art platforms on individuals' exploration of artworks and overall well-being. Moreover, the advent of the COVID-19 pandemic significantly disrupted the operations of art institutions, making the adoption of virtual platforms crucial for ensuring continued engagement with audiences and the preservation of cultural experiences (Cotter & Pawelski, 2021).

In summary, the findings of this study contribute to the growing body of research that demonstrates the potential of virtual art as a means of promoting well-being. The results suggest that digital technology can be effectively utilized in arts and well-being spaces, offering opportunities for practical implementation in real-life settings. This aligns with previous studies (Cotter et al., 2022; Trupp et al., 2022; Trupp et al., 2023) that have highlighted the positive impact of online art interventions on individuals' well-being. The findings open up new possibilities for leveraging digital technology in art-related initiatives aimed at enhancing well-being outcomes.



## **Limitations of the Study**

Despite the strengths of this study, there are several unique limitations to consider. Firstly, the virtual nature of the gallery experience introduces factors that differ from traditional in-person encounters, such as the absence of physical presence and tangible artwork. This could impact the emotional and sensory aspects of the art experience. Future research should explore the specific effects of virtual art immersion and interest on well-being outcomes and compare them to traditional gallery settings. Secondly, given the novelty of virtual galleries, there is limited existing research to draw upon, making it challenging to establish comprehensive comparisons and benchmarks. Lastly, the study's methodology relied on self-report measures, which may be subject to response bias and social desirability effects. Despite these limitations, this study provides valuable insights into the unique aspects of the virtual gallery experience and highlights important avenues for future research.

## **Implications**

By investigating the relationships between immersion in art viewing, interest in artworks, and well-being within the virtual gallery experience, this study has provided insights that can inform future research and practice. The findings of this study open up several potential research directions. First, future research could investigate how to promote immersion in art viewing and interest in artworks to optimize well-being outcomes. This could involve examining psychological processes such as emotional regulation, cognitive engagement, or aesthetic appreciation. Second, exploring the role of different art forms and genres in promoting well-being could provide insights into the specific features or qualities of art that have the most significant impact. Lastly, considering the potential moderating factors, such as individual

differences in personality traits or cultural background, could deepen our understanding of the boundary conditions of the relationship between virtual visual art and well-being.

The unique setting of the digital gallery experience opens up intriguing avenues for future research. Firstly, understanding the specific factors that contribute to the effectiveness of virtual art immersion and interest in promoting well-being would be valuable. This could involve examining variables such as interactivity, user interface design, and the role of virtual reality or augmented reality technologies. Secondly, exploring the potential differences and synergies between digital and in-person gallery experiences could provide insights into the distinct qualities and advantages of each format.

The findings of this study have implications for practitioners in various domains. First, professionals in the field of mental health and well-being could consider incorporating virtual visual art-based interventions or activities as part of their therapeutic approaches. Second, museums, galleries, and cultural institutions can leverage the power of virtual visual art to promote well-being by curating immersive experiences that cater to a diverse range of interests and preferences. This has significant implications for art institutions, particularly in times of crisis or limited physical access, as the adoption of virtual platforms can enable them to reach a broader and more diverse audience.

### **Conclusion**

The findings of this study contribute to the understanding of the role of art immersion and interest in facilitating human flourishing outcomes. The positive associations found between immersion in art viewing, interest in artworks, visit satisfaction, and well-being suggest that the virtual gallery experience has the potential to foster human flourishing. By elucidating these connections, the findings of this study contribute to the growing body of literature on the

psychological and experiential aspects of visual art engagement in a virtual context. The implications of this research extend to various fields, including Positive Psychology, Positive Humanities, psychology of aesthetics, and cultural interventions, offering potential avenues for designing interventions that promote well-being through visual art experiences.

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