# Slow Looking at Still Art: The Effect of Manipulating Audio Context and Image Category on Mood and Engagement During an Online Slow Looking Exercise

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Aleksandra Igdalova and Rebecca Chamberlain developed the study concept and the study design. Stimuli were developed by Aleksandra Igdalova. Testing, data collection, and analysis were performed by Aleksandra Igdalova. Aleksandra Igdalova and Rebecca Chamberlain interpreted the results, and Aleksandra Igdalova wrote the manuscript. All authors approved the final version of the manuscript for submission.

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**Citation:**

Igdalova, A., & Chamberlain, R. (2023). Slow looking at still art: The effect of manipulating audio context and image category on mood and engagement during an online slow looking exercise. *Psychology of Aesthetics, Creativity, and the Arts*. https://doi.org/10.1037/aca0000546

**Abstract**

In the past two decades, “slow looking” has emerged as an engaging art-viewing approach used by museums around the world as part of their in-person and online programming, but there has been little empirical inquiry into the precise effects of the practice. This study represents the first such attempt, exploring reported impacts of slow looking within an online context. Specifically, the study examined the effects of two factors—audio context (control, meditation, historical) and image category (photography, representational, abstract)—on mood change and aesthetic engagement. A total of 141 participants completed the online exercise, first selecting a series of three artworks within one of the image categories and then viewing each for 3 min per work while listening to the randomly allocated audio context. Participants reported feeling significantly more pleasant and relaxed after the exercise. Representational artworks were chosen the most and also contributed to greater overall aesthetic experience scores, and the historical condition was found to lead to greater levels of cultural understanding and engagement. Future investigation within an ecologically valid setting is currently underway, examining the contribution of different live viewing elements to the slow-looking experience.

**Keywords**: slow looking, art viewing, mood, aesthetic experience, context

# Introduction

## The Rise of Slow Art, Physically and Virtually

Likening the process of art viewing to an "experience" rather than a simple response to visual stimuli, American pragmatist John Dewey (1934) maintained that looking at artworks was a key part of aesthetic education, leading to more pronounced and healthier relationships with ourselves and the world around us. Indeed, a plethora of large-scale studies have corroborated the benefits of engagement with the arts and humanities, showing evidence of reduced mortality risks (e.g., Fancourt & Steptoe, 2019b; Konlaan et al., 2000; Väänänen et al., 2009), decreased occurrence of various mental health disorders, such as depression, anxiety, and dementia (e.g., Cuypers et al., 2011; Fancourt & Steptoe, 2019a; Fancourt & Tymoszuk, 2019), and greater ratings of subjective well-being (e.g., Cuypers et al., 2011; Węziak-Białowolska & Białowolski, 2016). Furthermore, engaging with the arts through cultural institutions, specifically by visiting art museums, has shown similar impacts, heightening subjective health (e.g., Grossi et al., 2019; Thomson et al., 2018) and quality of life (e.g., Schall et al., 2018; Wilkinson et al., 2007) while simultaneously lowering levels of mental health risk (e.g., Binnie, 2010; D'Cunha et al., 2019).

For this reason, it is imperative for investigators in empirical aesthetics to turn their efforts to research on art viewing within cultural institutions. One of the best ways to do so is by studying the specialized educational strategies used by institutions around the world, especially as these institutions adopt more visitor-oriented approaches (Mayer, 2005). 'Slow looking' is one such approach, encouraging museum visitors to look 'more slowly' at a single work of art. At its most basic definition, slow looking implies art viewing for a period longer than the 27.2 to 32.9 s average previously found in viewing behavior studies (Carbon, 2017; J. K. Smith & Smith, 2001;

L. F. Smith et al., 2017). But in practice, most slow-looking programs incorporate even longer viewing times — usually 5 to 10 min — in line with other visual thinking strategies that aim to increase engagement (Housen, 2002). And like those strategies, slow looking usually involves more than just spending extended time. It also incorporates techniques for looking that similarly require more time, most commonly in the form of a guided approach led by a museum educator and subsequent discussion afterward (Tishman, 2017).

And these guided approaches have varied globally across museums and galleries. Since its launch in 2010, Slow Art Day, occurring on the 2nd of April each year, has been hosted at over 1,500 different venues across all seven continents (Slow Art Day, 2021). Even as most of these institutions closed their physical doors during the height of the COVID-19 pandemic in 2020, switching to online programming to show off their collections and foster arts engagement from a distance (Agostino et al., 2020; Samaroudi et al., 2020), slow-looking directives stayed just as relevant. Fifty-four museums around the globe adapted their Slow Art Day activities to the online realm, incorporating digital marketing and social media interaction, guided video instructions, Zoom discussions, and, of course, engaging artworks, to remind their visitors that the benefits of art interaction extend beyond the physical space of the cultural institution. Every one of the virtual events involved viewing a selection of artworks from the institution for several minutes or longer, but the prompts alongside the viewing instructions differed from gallery to gallery. Some of these prompts gave information on the artist while others focused viewer attention on the formal qualities of the works while others still encouraged mindful breathing or stream-of-consciousness notetaking (Slow Art Day, 2021)

**The Success of Slowing Down**

In their 2020 annual report, the Slow Art Day founders collated each institution's post-program feedback and found it to be generally positive, both from the programming leaders and from online viewers. Participant feedback included some of the following sentiments: "This is the sort of thing I need to lift my spirits, just like every visit to your gallery has always done;" "A really interesting session ... I'm more mindful of how to observe art in the future;" and "I was very moved by the art selections and benefitted from this experience greatly," suggesting that this type of viewing approach, even in an online context, can lead to well-being benefits such as short-term mood improvement and enhanced engagement through emotional impact and increased visual literacy (Slow Art Day, 2021). Providing further support to this, Shannon Lyons, an education coordinator at TarraWarra Museum of Art in Melbourne, Australia, said the following regarding the online slow-looking event and discussion:

> From an educator's perspective, it was interesting to see how willing people were to both delve deeper and give voice to their wonderings online. They actively questioned why aspects of the artworks appeared the way that they did, and why particular elements of the artworks seemed to dominate, hold, or demand attention far more than others.
>
> (Slow Art Day, 2021).

Furthermore, retrospective reports on each institution's online Slow Art Day indicated that the programming brought in new audiences, both in terms of geographic engagement with regards to the particular institution and in terms of infrequent museum goers (Slow Art Day, 2021). This latter finding is in line with a wider trend in increased demand for online arts engagement during

the COVID-19 pandemic (Unitt, 2020), leading to new incentives and opportunities for infrequent arts visitors to participate in these encounters (Mak et al., 2021). The practice of slow looking, therefore, particularly in online contexts, should be examined as a potential means of facilitating mood improvement and stronger arts engagement for wider audiences.

**A Brief Survey of Slow-Looking Studies**

But while increasing implementation of slow art programs across the world — and analogous participant feedback — seems to suggest that slow looking may lead to certain art engagement benefits, there has been little empirical research on the topic, although longer viewing times have been used in the design of different studies in the past. Jessica Davis (1996), working with Harvard's Project MUSE, was one of the first researchers to incorporate leisurely viewing exercises into her studies on art education in which she established a set of learning approaches to be used alongside art viewing for untrained observers and children. This work was later followed up by Seifert and Drennan (2000) who used the same longer viewing periods to expand upon these different learning approaches for art object interpretation. Paul Locher and colleagues (2015) similarly gave trained and untrained observers the choice to view works for an unlimited time period in their study exploring beliefs about authenticity status of paintings, though the researchers observed a mean viewing time of only 18.6 s across their participants.

With regards to exploring the impacts of longer viewing time on art engagement, other than a small number of single-subject reports (Clark, 2006; Funch, 2019; Reed, 2017), only one research study has investigated the influence of slow looking on a population level. Lachapelle et al. (2009) had 34 non-expert participants engage in two viewing activities – the first in which

they could look at as many works as they wanted while engaging in a think-aloud protocol and a second in which they had to look at an artwork for 5 min and then think aloud for 5 min after viewing. But while the researchers did find that a mandatory longer viewing time led to increased art appreciation as determined by enumerative analysis, their study lacked a control condition and standardized dependent measures.

Perhaps one of the reasons that slow looking has yet to be fully investigated is due to its hard-to-pin-down nature. For while longer viewing times have been used and examined in a handful of studies (e.g., Lachapelle et al., 2009; Locher et al., 2015), most museums, in practice, combine this extended view with other approaches (Slow Art Day, 2021). For this reason, it is unclear what precisely gives the most impact — longer viewing on its own or longer viewing combined with a guided approach. And if the combined method is the most effective, for example, there remains a further gap in the literature on which type of guided approach works best in strengthening these impacts. The present study was, thus, the first of its kind in that it investigated the impacts of slow looking, as well as the nuances of the relationship between longer viewing times and different guided approaches, in a large sample of online participants.

**How to Slow Look, Properly**

Even prior to the rise in popularity of slow looking, there has been a long-standing debate within gallery walls on the proper way to present artworks such that they elicit maximal engagement, with institutions like the Museum of Modern Art (MOMA) and the Philadelphia Museum of Art (PMA) famously advocating for differing levels of contextual information for their in-gallery programming (Tishman, 2017). Ishiguro et al. (2021) empirically investigated this debate by

assessing which of two opposing contextual interventions greater impacted viewing time, tracked eye movements, and overall evaluation of the works. A previous report by the team is showed that conducting an art-creation course for non-expert participants changed the art viewing strategies employed by the laypeople to be closer to those of the artistically trained group (Ishiguro et al., 2016). In a similar vein, the follow-up study, conducted in 2019, explored educational interventions during the viewing period to increase visual literacy. Participants were assigned either to the art historical lecture condition or the Visual Thinking Strategy, or VTS, condition — which relies on a dialogical appreciation technique emphasizing visual details and personal interpretations of the artworks without historical context — for four weeks of mediated instruction. The results showed that the VTS intervention led to increased viewing times after the intervention but no difference in evaluation strategy compared to the lecture condition (Ishiguro et al., 2021). While lacking a control condition, the study is one of the first to suggest that the didactic framework of the art viewing experience can lead to behavioral impacts.

The present study sought to similarly explore this question of contextual intervention but while mapping it onto a fixed slow-looking timeframe. Three testing parameters were chosen for the context, inspired by the most common viewing approaches employed by both museums in their general in-person programming and by institutions hosting online slow-looking activities during the pandemic (e.g., Slow Art Day, 2021). Art historical background, akin to audio-guide use or educational programming in galleries (e.g., Burnham & Kai-Kee, 2005; Hubard, 2007), was selected as the first context, called the ‘historical’ condition. This choice is supported by previous research, which suggests that historical information influences viewer understanding and evaluation of artworks (Jucker et al., 2014; Kruger et al., 2004; Leder et al., 2006; Swami, 2013), an effect that can be observed even when accounting for art expertise in non-expert and

expert viewing (Szubielska et al., 2018; Szubielska & Sztorc, 2019). Next, a combined mindfulness / visual thinking approach like that used in early slow-looking studies (e.g., Davis, 1996; Seifert & Drennan, 2000) was chosen as a second guided context, which we call the 'meditation' condition. Style-related information — prompting participants to consider either the visual aspects of the artworks or the conditions in which they were made — has been found to positively impact on aesthetic appreciation of the works (Belke et al., 2006; Demery, 1984), whereas mindfulness meditation, shown to improve creativity (Jedrczak et al., 1985), even at short practice lengths (Ding et al., 2014), has been found by Zabelina and colleagues (2020) to result in deeper art viewing experiences in both children and adults as compared to a control group. Lastly, a control audio context, called the 'control' condition, in which participants are allowed to freely view the works without any guidance for the duration of the timeframe, mirrors the category of online slow viewing programming that had viewers look on their own and then either participate in a group discussion, note-take, draw, or otherwise engage in any further reflective activity after the viewing period ended (Slow Art Day, 2021).

**Not All Art Is Created Equal**

There is also the possibility that certain categories of art, or even specific features in certain artists' works (Chamberlain & Pepperell, 2021), are better suited for slow viewing. Indeed, there was an array of photographic, representational, and abstract works showcased by each institution for their online slow viewing events, although abstract art was shown more frequently by the hosting educators (Slow Art Day, 2021). This stands in opposition to what has been found regarding general preferences for art viewing, in that non-expert viewers tend to prefer

representational art over abstract art (Pihko et al., 2011; Uusitalo et al., 2012), with representational artworks showing greater convergence of evaluation and associations across viewers (Schepman et al., 2015). But this preference may also change as viewing time is increased, as evidenced by an earlier study by Cupchik and Gebotys (1988), which found that men and women experienced pleasure from different image categories with increased viewing time: women preferred abstract works as duration increased whereas men preferred representational works.

There is, therefore, an inconclusive relationship between the museum educator's selection of image category, the viewer's initial preference of image type, and the changes in preference that may occur as viewing time progresses. So, to further etch out this relationship, we incorporated self-selected image category as one of the predictors in our study. This design choice served a dual purpose: 1) to investigate what category of image participants would select when informed of the duration of viewing they would perform , and 2) to make the viewing experience, although screen-based in this particular study, more akin to the viewing experience in a gallery, in which participants can freely select what artwork they were most interested in viewing, a factor which leads to greater aesthetic freedom (Tschacher et al., 2012). The selected categories were chosen to represent different types of information that participants may find suitable for slow viewing: photographic works, which realistically depict the subject but with a slight abstraction of the lens and perspective; representational paintings, which, while depicting realistic objects, feature symbolic references and tell a story through allegorical depiction; and abstract paintings, which rely on stylistic elements to play with visual perception and symbolism.

**Where Can We See the Impacts of Slow Looking?**

While participant feedback from Slow Art Day's (2021) online programming hints to the possibility of short-term mood improvement because of longer viewing times, there has been no formal study linking slow looking to mood repair. Despite this, there is evidence to suggest that this could very well be the case. Past studies have indicated that some aspects of well-being, including mood change, are susceptible to contextual changes in environment, such as by means of an art intervention (Fredrickson & Branigan, 2005). This general finding is supported by more recent research on well-being outcomes, including emotion regulation and mood improvement, that can change as a result of arts engagement (e.g., Fancourt & Steptoe, 2019a; Ivcevic & Brackett, 2015; Thomson et al., 2018)

Furthermore, there has been evidence linking dimensions of mood, namely valence and arousal, to general art viewing and engagement. De Rojas and Camarero (2006) were one of the first empirical researchers to establish mood as one of the variables a visitor brings with them that can determine the satisfaction indexes of an exhibition visit, though their tested causal model did not investigate how mood may change as a result of the visit. However, pre-post assessments were used in another study in which researchers found an increase in positive valence following art viewing directives even in non-art environments, in this case, a hospital setting (Ho et al., 2015). Next, changes in arousal— an important dimension of mood states (Barrett & Russell, 1999; Feldman Barrett & Russell, 1998; Watson & Tellegen, 1985) — have been found to accompany art viewing (Brinck, 2018; Marin et al., 2016), even in periods of short viewing duration, such as a lunchtime visit to an art gallery (Clow, 2006). These subsequent arousal changes may later contribute towards regulation of emotional states (Thayer et al., 1994) and subjective well-being

(Collins et al., 2009). Slow looking, then, as an approach that builds upon the activity of art viewing, both in terms of duration and in terms of added context, could also then impact on valence and arousal measures associated with mood. Moreover, if this effect is found even within a screen-based context, then online slow-looking programming could be used as a vehicle for delivering well-being outcomes in a more inclusive way to wider reaches of audience.

Similarly, while the Lachapelle et al. (2009) study found an impact of prolonged viewing on art appreciation, the nuances of aesthetic engagement as a result of slow looking are undefined. But because aesthetic experience has been identified as an important factor in art interventions, comprising one of the mechanisms that may impact on well-being (Fancourt & Finn, 2019) and inducing pleasurable states that can impact and regulate mood (Mastandrea et al., 2019), it's important to investigate the effects of slow looking on different dimensions of aesthetic experience. This is especially the case when assessing the impacts of different guided approaches, in that museum educators can have a better understanding of which approach they want to use for a desired learning or aesthetic outcome.

**The Present Study**

The present study, therefore, sought to investigate the impacts of slow looking, under different audio contexts and between image categories, on mood, as measured by valence and arousal, and on aesthetic experience. In this online experiment, participants were randomly sorted into one of three viewing context conditions and given a choice of one of the three image categories for slow looking. After viewing three images by their selected artist for 3 min each, participants reported any mood change and filled out a questionnaire on aesthetic experience. As art expertise has

been shown to influence behavioral engagement and preference for artwork genre (Szubielska et al., 2018; Szubielska & Sztorc, 2019; Vogt & Magnussen, 2007; Zangemeister et al., 1995), artistic interest was included as a covariate.

Based on the specific research aims, predicted hypotheses were as follows:

1) Observers would experience short-term mood improvement, as measured by increased valence and decreased arousal, in response to all slow-looking conditions and image categories.

2) There would be a main effect of audio context upon mood change and aesthetic experience, with the meditation condition prompting higher responses in both variables due to its resemblance to earlier slow-looking studies on art viewing approaches for untrained observers (e.g., Davis, 1996; Seifert & Drennan, 2000).

3) There would be a non-directional main effect of category upon mood and aesthetic experience.

## Methods

### Experimental Design

The study used a 3x3 factorial design in which the dependent variables were change in mood as measured by the Affect Grid (Russell et al., 1989) and aesthetic engagement as measured by the Aesthetic Experience Questionnaire (Wanzer et al., 2020). The independent variables were audio context condition — control, meditation, historical — as a randomized between-subjects factor and image category — photography, representational, abstract — as a participant-selected between-subjects factor.

**Sample Size**

In the absence of previously published studies testing conditions of slow looking, the sample size calculation was based on a standard between-subjects analysis with nine groups, a medium effect size of $f = .3$, and an alpha of .05. An a priori power analysis conducted with G*Power3 (Faul et al., 2007) indicated that a total sample of 138 participants was required to achieve a statistical power of .80. To account for the fact that there may be unequal distribution of category groups due to participant choice, data collection efforts aimed for a greater number. A total of 225 participants completed the survey, but 84 were removed for not finishing the experiment or for reporting they did not complete the survey seriously.

**Participants**

Participants were recruited as a convenience sample through word-of-mouth and social network distribution and gave voluntary participation. Participants completed the study between June and August of 2020 during the time of COVID-19 lockdowns in Europe and the United States. Eligibility criteria required that participants be over 18 years of age.

The 141 participants ranged in age from 18-72 years ($M = 35.81$, $SD = 14.73$), with a slight skew to the younger ages. In terms of gender, 43.3% of the participants were male, 54.6% of the participants were female, and 2.1% reported other. Though representing a diverse total of 23 different nationalities, the majority of participants were from the United States (53.2%), Great Britain (9.2%), and Russia (7.1%), and most held either bachelor's degrees (40.4%) or master's degrees (37.6%). Twenty-four of the 141 participants reported visual impairments, including

floaters, nearsightedness, amblyopia, astigmatism, but no participants were excluded on the basis of these conditions. Lastly, there was a moderate level of art interest ($M$ = 53.90 out of 77, $SD$ =12.11) in the total sample of participants as determined by the Vienna Art Interest and Art Knowledge Questionnaire, or VAIAK (Specker et al., 2020), with no difference in art interest distribution between the three condition groups, $F(2,138) = 2.36$, $p = .099$.

## Materials and Stimuli

The Qualtrics survey that comprised the experiment included the viewing exercise — a set of three still life pictures from the participant's chosen image category — and a series of questionnaires measuring artistic interest, aesthetic engagement, mood change, demographics, and several Likert-scale and open-ended questions regarding the participant's overall experience.

### *Viewing Task*

**Image genre.** The still life image was chosen as a neutral genre base to balance content across the three audio conditions without the presence of people, sublime nature scenes, or obvious cultural artifacts that may affect participant responses. Any comparison in viewer interaction with the three categories of image could therefore help illuminate some of the dynamics between stimulus and observer contributions to the slow-looking process.

**Pilot Study.** A slow viewing pilot study ($N$ = 10) was conducted to determine the artworks to be used for each categorical set as well as the optimal timing per image. Based on accurate representation of category, previous familiarity, and willingness to look at each artist's work, Irving Penn was chosen as the photographic artist, Jan Davidsz. de Heem was chosen as the

representational artist, and Fernand Léger was chosen as the abstract artist (see Figure 1 for sample representational and abstract works; see https://osf.io/3bajp/ for link to photographic work). Furthermore, participants also indicated that they preferred a viewing time of 3 min, which is less than traditional in-person slow viewing exercises (Chamberlain & Pepperell, 2021) but considerably more than average unaided viewing times reported within galleries (Carbon, 2017; J. K. Smith & Smith, 2001; L. F. Smith et al., 2017). Lastly, survey respondents also indicated that loss of focus was a major factor, so a pre-viewing focusing exercise was added to the protocol.

**Figure 1**

*Stimuli for Representational and Abstract Image Categories (Photographic Image on OSF)*

**Jan Davidsz. De Heem** (Representational)

*Still Life with Lobster and Nautilus Cup*

1634

[Public Domain. Courtesy of Staatsgalerie Stuttgart.]

**Fernand Léger** (Abstract)

*Still Life with a Beer Mug*

1921 - 1922

[Public Domain. Courtesy of Tate Modern.]

**Video Stimuli.** The artworks were presented to the participant as YouTube videos. Each video began with an 88 s focusing exercise, which showed an animated GIF (Healthline Media, 2019) that demonstrated the box breathing, or four-square breathing technique. The rest of the videos then showed each static artwork image for a length of 3 min with varying lengths of audio voiceover depending on the audio context. A total of 27 videos were made to account for each of the three images in the three categories of the three audio conditions.

***Voiceover Text and Timing.*** Different voiceover texts were played for the participants depending on the experimental audio context, image category, and image number (see Figure 2).

For the control condition, the text was the same across all three artworks in a set as well as across the three categories. The open-ended guidance only told participants to keep their eyes on the image as best they could while engaging with the work however they wished. The voiceover ran at a length of approximately 30 s — followed by 2.5 min of silent viewing.

For the meditation condition, the videos featured different texts for the first, second, and third artworks in a set, but these texts were the same across image categories. The first text introduced mindfulness meditation, asking open-ended questions about the artwork's appearance. The second text guided the participant around the artwork, asking specific questions regarding the formal qualities of the work. The final text prompted the participant to look at the artwork in a similar manner to the previous image but suggested an internal focus as well, asking the participant to survey their own feelings about the artwork and the act of looking itself. Each

voiceover was approximately 2 min in length to allow for 1 min of uninterrupted viewing at the end.

For the historical condition, each artwork in each category had its own voiceover text, although the first, second, and third images followed the same format across the categories. The text of the first artwork gave a general history of still life paintings, contextualizing the particular series being viewed. The second text focused on the life of the artist, situating the artwork at hand within the artist's stylistic tradition. The third artwork text featured a formal and symbolic analysis of the particular image. Each voiceover was approximately 2 min in length to allow for 1 min of uninterrupted viewing at the end.

To download full transcripts of the focusing exercise voiceover and each of the three audio context voiceovers, please visit the following link: https://osf.io/3bajp/

### *Measures / Questionnaires*

**Demographics.** Demographic questions at the beginning of the survey measured age, gender, nationality, highest education level, and history of visual impairments.[1]

**Vienna Art Interest and Art Knowledge Questionnaire.** Artistic interest was measured by means of the first scale of the VAIAK, developed by Specker et al. (2020). Part A of this questionnaire comprises 11 questions measuring subjective interest and concrete behaviors regarding art practices. All the questions were scored on a 7-point scale with anchors from 1 (*not*

*at all / less than once a year*) to 7 (*completely / once a week or more*). A composite art score was calculated to determine overall level of art interest.

**Affect Grid.** Developed by Russell et al. (1989) as a reliable and valid way of assessing mood, the Affect Grid is a self-reported, single-item measurement tool that has been used in other art viewing and art making studies (e.g., Drake et al., 2011). The scale assesses two dimensions of mood — valence, i.e. from unpleasant to pleasant feelings, and arousal, i.e. from high arousal to sleepiness — that in combination can describe specific states such as stress, calmness, enthusiasm etc. The valence and arousal scores ranged from 1 to 9 and were determined by where the participant placed a mark on the 9x9 grid: the valence score (P) was determined by the column number from the left and the arousal score (A) was determined by the row number from the bottom.

**Aesthetic Experience Questionnaire.** Developed by Wanzer et al. (2020), the Aesthetic Experience Questionnaire, or AEQ, is a 22-question scale measuring aesthetic experience. Designed for use across all visual art domains, the survey was used in the present study to measure aesthetic engagement with the viewing task. The AEQ features four subscales based on four art-related dimensions — emotional, cultural, understanding, perceptual — and two subscales based on the flow experience of viewing art proposed by Csikszentmihalyi and Robinson (1990). In the present study, one of the flow subscales, measuring the proximal content of the flow state, was excluded because the questions were not appropriate to the task and the context of the current study. In addition to the five mean subscale scores, an AEQ composite

score was also calculated to measure overall aesthetic engagement. A 5-point Likert scale was used for each of the 19 questions.

**Evaluative Questions.** A series of evaluative questions about the slow-looking exercise were also asked on a 5-point Likert scale. These included the following: how easy/hard participants found the exercise, whether the exercise got easier/harder and less intense/more intense over time, how similar/different and less interesting/more interesting the exercise was from their normal viewing experiences. They were also asked if they would try slow looking again, in person or online. Lastly, participants were prompted to leave any qualitative comments in an open-ended answer box.

## Procedure

Clicking on the Qualtrics link, participants were asked to view the experiment on a laptop with headphones. After consenting, they answered pre-experimental questions on demographics and art interest and indicated their current valence and arousal levels on the Affect Grid. Next, participants were shown three sets of three images without any text or labels, corresponding to the three artwork categories (photography, representational, abstract). They were prompted to freely select which set of artworks they would most prefer to view during the slow-looking exercise. Participants self-sorted themselves into the following category breakdowns — photography ($n$ = 37), representational ($n$ = 61), abstract ($n$ = 43).

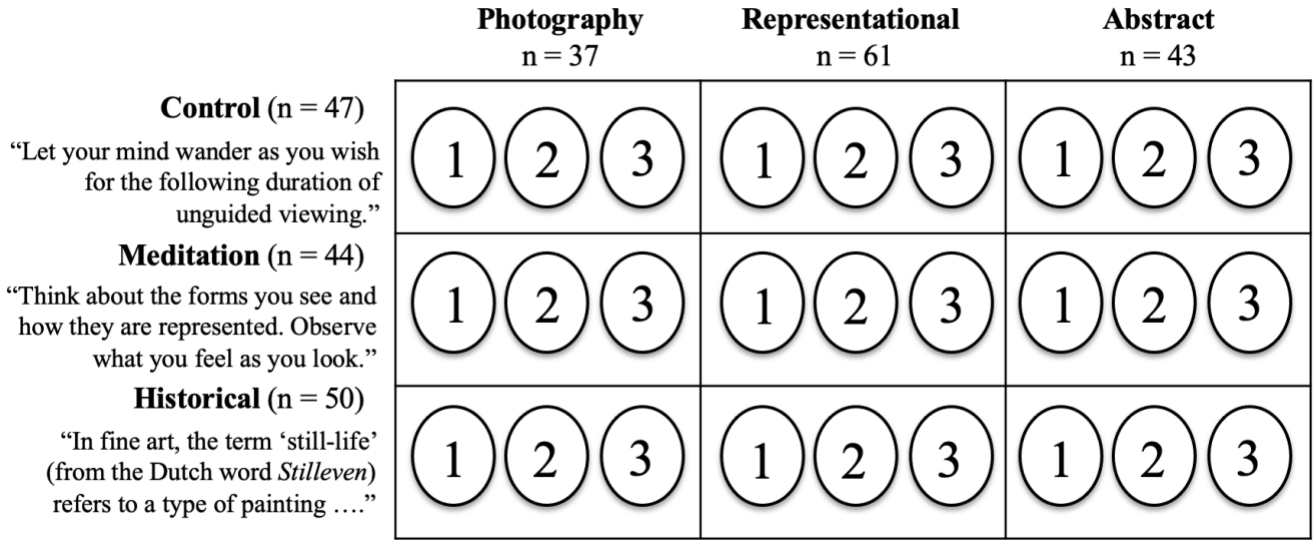
Following this, participants were randomly allocated to one of the three audio conditions — control ($n$ = 47), meditation ($n$ = 44), historical ($n$ = 50) — using the Qualtrics Randomizer

function (see Figure 2 for full context and category procedural breakdown). They were then shown the first Youtube video and instructed to get into a comfortable seated position at a 50-100 cm distance from their screen, put on their headphones, and make the video full screen, watching it until the end of the clip. Participants were given the option to take a short break between the first image and second image, with the following instructions: "Take a few minutes break here if you would like. Please do not look at your phone or interact with other devices. When you are ready to continue to the next video, please hit the next button." Participants were then instructed to perform the same series of actions for the second and third image in their chosen series. Total time spent on each page was recorded by the Qualtrics timing option.

After the viewing task, participants indicated their arousal and valence levels on another Affect Grid and filled out the AEQ. They were then asked the series of evaluative questions about their viewing experience. It took participants a median time of 23.8 min to finish the survey.

**Figure 2**

*Context and Category Breakdown (N* = 141)



### Ethics

This study was reviewed and approved by the Research Ethics and Integrity Sub-Committee of Goldsmiths University, London. Participants were informed on the experimental procedure through a study information page at the beginning of the survey. After giving their consent and completing the survey, participants were shown a debrief form.

## Data Preparation

Data preparation and analysis was performed using IBM SPSS Statistics.

### Composite Variables

An art interest score (out of 77) was computed for each participant by combining his or her scores on each of the 11 Likert scale questions, as per Specker et al. (2020). Change in mood, split into its two dimensions of change in valence and change in arousal (both ranging from -9 to 9), was computed by subtracting the values of the first Affect Grid score from the second (P2A2 – P1A1) and then separating the variables. Subscale scores for the five AEQ sections — emotional, cultural, perceptual, understanding, and flow experience — were computed by taking the mean of the scores within each section, and a composite total engagement score was also computed by taking the mean of all 19 questions, as per Wanzer et al. (2020). All of the AEQ composite scores were out of 5.

**Viewing Time**

A cursory analysis of the variables indicated that viewing time recorded on each of the three video trials varied among case numbers, suggesting that not all participants engaged with the stimuli in the same manner. Based on the focusing exercise length (88 s), actual time spent watching each trial was calculated for each participant by subtracting 88 s from the total time viewed per page — see Table 1 for viewing times per image as split by audio context.

**Table 1**

*Median Viewing Time Per Audio Condition Per Video Trial (N* = 141)

| Audio Condition | Video Trial 1 Mdn (s) | Video Trial 2 Mdn (s) | Video Trial 3 Mdn (s) |
|---|---|---|---|
| Control | 202.79 | 195.14 | 195.88 |
| Meditation | 202.39 | 200.55 | 198.08 |
| Historical | 192.81 | 187.27 | 173.17 |

The median viewing time per condition and trial suggested that participants did engage in slow looking. However, a small number of participants showed viewing times of less than 30 s indicating they spent less time with the works than the mean viewing time often found in a gallery context (Carbon, 2017; J. K. Smith & Smith, 2001; L. F. Smith et al., 2017), thereby not actually participating in slow viewing. For this reason, we further filtered the data, thereby reducing the total sample size. To ensure that every participant engaged in at least one slow-looking exercise during the experiment, a cut-off time of 30 s was applied to each video trial. Participants that had an actual viewing time > 30 s for any of the trials were included in the analysis, meaning they had slow looked at least one of the three artworks in the series. This

selection process led to a total $N = 132$ (control = 42, meditation = 44, historical = 46, with five participants in the control condition, zero in the meditation condition, and four in the historical condition being filtered out; and photography = 34, representational = 57, abstract = 41, with three participants who chose the photographic category, four who chose the representational one, and two who chose the abstract one being filtered out). A series of factorial ANCOVAs, examining the effect of audio condition and category on mood and aesthetic engagement, were then conducted on this sample.

**Data Screening**

The data was screened for normality, missing values, outliers and ANCOVA assumptions prior to analysis. Every variable had a normal distribution except for the perceptual engagement score, to which a log transform was applied, resulting in normal skew / kurtosis values (-0.51 / 0.44). Little's MCAR test indicated that any missing data was missing completely at random, $X^2(21, N = 132) = 23.48$, $p = .319$. While the percentage of missing data of art interest scores was only 2.2%, because the variable was a summed composite of 11 scores, a mean imputation was carried out for the missing values. For ANCOVA testing, the homogeneity of regression assumption was not met by the following AEQ measures as the CV*IV interaction term was significant: perceptual engagement and understanding, $F(2, 114) = 4.29$, $p = .016$, and $F(2, 114) = 3.13$, $p = .047$, respectively. For these latter variables, a non-parametric ANOVA alternative – the Kruskal-Wallis test — was performed in place of an alternate covariate analysis after confirming that the data met the assumption of equal variability of group distributions. Effect size for the non-parametric test was calculated based on the following formula (Cohen, 2008): $\eta^2 = (\chi^2 - k + 1) / (N - k)$.

# Results

## One Sample T-Test

Two single sample t-tests were carried out to see if there was a change in mood pre- and post-intervention, regardless of audio context or image category.

### *Hypothesis 1: Mood Change Regardless of Condition / Category*

Participants reported a statistically significant increase in valence, ($M$ = 1.13, $SD$ = 1.80), $t(127) = 7.08$, $p < .001$), with valence becoming more positive and moving towards the 'pleasant' side of the scale from before ($M$ = 6.04, $SD$ = 2.04) to after ($M$ = 7.20, $SD$ = 1.57) viewing, and a statistically significant decrease in arousal, ($M$ = -.66, $SD$ = 1.83), $t(127) = -4.07$, $p < .001$, with arousal becoming more negative and moving towards the 'sleepy' side of the scale from before ($M$ = 4.71, $SD$ = 1.70) to after ($M$ = 4.02, $SD$ = 1.75) viewing.

## ANCOVAS and Kruskal-Wallis Tests

A series of factorial ANCOVAs were performed to test the main effect of audio condition and image category on change in valence and arousal and on the emotional, cultural, flow experience, and total engagement AEQ scores, while accounting for artistic expertise. A series of separate Kruskal-Wallis analyses testing for main effects of audio condition and image category, without covariate control and effects, were performed on the perceptual and understanding scores that failed ANCOVA assumptions.

***Hypothesis 2: Main Effect of Condition on Mood and Aesthetic Experience***

After running a series of ANCOVAs to test the effect of audio condition on mood and aesthetic experience variables, audio condition was found to have a significant effect on cultural engagement scores, $F(2,122) = 7.35$, $p = .001$, $\eta_p^2 = .108$. Post hoc comparisons using the Tukey HSD Test showed that participants in the historical condition ($M_{adj} = 3.75$, $SE = .13$) had significantly higher cultural engagement ratings than participants in the control ($M_{adj} = 3.23$, $SE = .14$) and meditation ($M_{adj} = 3.05$, $SE = .14$) conditions, $p = .022$ and $p = .001$, respectively. No significant effects of condition were found for the other variables (see Table 2).

After running a series of Kruskal-Wallis tests on the non-parametric variables, a significant difference in understanding scores was found between the different condition groups, $\chi^2(2, N = 132) = 9.87$, $p = .007$, $\eta^2 = .061$. Pairwise post hoc comparisons using Dunn's test indicated that the historical group (mean rank = 80.72, *Mdn* = 3.88) had significantly higher understanding ratings than the control (mean rank = 58.98, *Mdn* = 3.62) and meditation (mean rank = 58.82, *Mdn* = 3.50) groups, $p = .006$ and $p = .007$, respectively. There was no significant difference between the control and meditation groups, $p = .985$. There was also no significant effect of audio condition on perceptual engagement scores, $\chi^2(2, N = 132) = 2.47$, $p = .291$, $\eta^2 = .003$.

***Hypothesis 3: Main Effect of Category on Mood and Aesthetic Experience***

After running a series of ANCOVAs to test the effect of image category on mood and aesthetic experience, category was found to have a significant effect on several variables. There was a significant group difference in cultural engagement scores, $F(2,122) = 8.08$, $p = .001$, $\eta_p^2 = .117$, between image categories. Post hoc comparisons using the Tukey HSD Test indicated that

participants viewing the representational ($M_{adj}$ = 3.67, $SE$ = .12) and abstract ($M_{adj}$ = 3.47, $SE$ = .14) image categories had significantly higher cultural engagement ratings than participants viewing photographs ($M_{adj}$ = 2.90, $SE$ = .15), $p$ = .001 and $p$ = .020, respectively. Next, while the main effect of category on flow experience scores was significant, $F(2,122) = 3.22$, $p$ = .044, $\eta_p^2$ = .050, the pairwise comparison of representational artworks ($M_{adj}$ = 3.84, $SE$ = .11) over abstract ones ($M_{adj}$ = 3.46, $SE$ = .13) was not significant after correction, $p$ = .052. There was no significant difference between the representational and photographic and photographic and abstract groups either, $p$ = .293 and $p$ = .100, respectively. Lastly, image category had an effect on total engagement scores, $F(2,122) = 5.72$, $p$ = .004, $\eta_p^2$ = .086, with higher ratings reported after viewing representational ($M_{adj}$ = 3.79, $SE$ = .07) works as compared to photographic ($M_{adj}$ = 3.44, $SE$ = .09) or abstract ($M_{adj}$ = 3.49, $SE$ = .09) works, $p$ = .011 and $p$ = .026, respectively. The other variables did not indicate a significant effect of category. The series of Kruskal-Wallis tests likewise did not indicate an effect of category upon the two non-parametric variables. See Table 2 for relevant statistics.

**Table 2**

*Results of Main Effects Testing – ANCOVAs and Kruskal-Wallis (N = 132)*

| Measures | *F* | *p* | $\eta_p^2$ |
|---|---|---|---|
| Change in valence | | | |
| Art interest | 0.26 | .611 | .002 |
| Condition | 0.58 | .563 | .009 |
| Category | 0.77 | .463 | .013 |
| Condition * Category | 0.83 | .510 | .026 |
| Change in arousal | | | |
| Art interest | 2.06 | .154 | .017 |
| Condition | 1.98 | .143 | .031 |
| Category | 0.84 | .436 | .014 |
| Condition * Category | 1.54 | .193 | .048 |
| Emotional engagement | | | |
| Art interest | 1.76 | .187 | .014 |
| Condition | 0.56 | .573 | .009 |
| Category | 1.75 | .178 | .028 |
| Condition * Category | 1.60 | .180 | .050 |
| Cultural engagement | | | |
| Art interest | 12.18 | .001** | .091 |
| Condition | 7.35 | .001** | .108 |
| Category | 8.08 | .001** | .117 |
| Condition * Category | 1.37 | .247 | .043 |
| Flow experience | | | |
| Art interest | 4.76 | .031* | .038 |
| Condition | 1.70 | .188 | .027 |

| | | | |
|---|---|---|---|
| Category | 3.22 | .044* | .050 |
| Condition * Category | 1.56 | .189 | .049 |
| Total engagement | | | |
| Art interest | 7.65 | .007** | .117 |
| Condition | 2.03 | .135 | .096 |
| Category | 5.72 | .004** | .090 |
| Condition * Category | 1.98 | .102 | .032 |
| | $\chi^2$ | *p* | $\eta^2$ |
| Perceptual engagement | | | |
| Condition | 2.47 | .291 | .003 |
| Category | 0.57 | .753 | .011 |
| Understanding | | | |
| Condition | 9.87 | .007** | .061 |
| Category | 5.12 | .077 | .024 |

*$p < .05$. **$p < .01$.*** $p < .001$

**Evaluative Question Analysis**

Out of 132 participants, 67% reported that they found the experience to be easy or very easy, and 55% reported that they found that the experience got easier or much easier over time, though this did not reflect on intensity of experience — a 43% majority reported that the experience remained largely the same in intensity over time. Over 50% of the participants reported that they found the experience to be more different or much more different than their normal art viewing experience, and 61% reported that they found the experience more or much more interesting than their normal art viewing experience (see means and standard deviations for each of the questions

in Table 3). Lastly, 96% of participants reported that they would try slow looking again, whether in person or on their laptops or phone.

**Table 3**

*Descriptive Statistics (Evaluative Questions, out of a 5-point Likert scale, N = 132)*

| Variable | Mean | SD |
|---|---|---|
| How did you find this looking exercise? **Hard: Easy** | 3.86 | 0.97 |
| How did you find this looking exercise? **Got harder over time: Got easier over time** | 3.58 | 1.08 |
| How did you find this looking exercise? **Got less intense: Got more intense** | 3.29 | 1.07 |
| How did this looking exercise compare to your usual experience of art-viewing? **It was about the same: It was very different** | 3.32 | 1.18 |
| How did this looking exercise compare to your usual experience of art-viewing? **It was less interesting: It was more interesting** | 3.83 | 1.01 |

## Discussion

This research study was one of the first studies to quantify the impacts of different slow-looking approaches and to examine possible factors that contribute to these effects. Specifically, the present online study investigated the role of audio context and image category on change in mood and aesthetic experience after participants slow viewed a series of still life artworks. As

hypothesized, we found that participants felt more pleasant and also more relaxed after completing the viewing exercise, regardless of their audio context or image category group. Next, audio condition was found to have a moderate to large significant effect on two subscales of aesthetic engagement —cultural engagement and understanding — specifically for participants who listened to the art historical context. Image category also had a significant impact on cultural engagement, flow experience, and total engagement AEQ scores. But while there was a main effect of condition and category on some of the AEQ categories, the meditation condition was not significantly singled out as hypothesized, nor were there any detected interaction effects.

**Slow Looking and Mood**

That participants experienced an increase in pleasantness and decrease in arousal supports the short-term mood improvement observed in participant feedback from online slow art events (Slow Art Day, 2021) as well as other studies that have indicated mood changes after art viewing in physical (Ho et al., 2015) and, more recently, online (Trupp et al., 2022) environments. But because the present study did not include a control condition that had participants viewing artworks for a more 'average' viewing time of about 30 s (Carbon, 2017; J. K. Smith & Smith, 2001; L. F. Smith et al., 2017), we cannot conclude that this impact on mood resulted specifically from slow looking or whether it was due to art viewing in general. However, a study by Cotter and colleagues (2022), conducted after the present research, in which the investigators examined the well-being impacts of a visit to a virtual art gallery with slow-looking conditions, showed that participants felt more relaxed and less tense following the visit, though the slow-looking groups did not show a bigger impact on arousal as compared to their control looking

condition. For this reason, a follow-up study, examining the differences in mood change between slow-looking and faster-looking conditions is recommended.

**On the Slow Side of History**

But regardless of how strong the impact of slow looking may be on valence and arousal, our research indicates that slow looking is made more effective when paired with a particular guided approach, even in an online context. The historical audio condition was the only group found to influence engagement, particularly on a cultural and understanding level. According to the AEQ survey authors, the cultural engagement factor accounts for "intellectually-based communication that require[s] historic and cultural knowledge," while the understanding factor suggests "cognitive and communicative experience not based on knowledge of art history or culture but rather trying to understand the artist based on personal insights" (Wanzer et al., 2020, p. 16). As the historical texts directly addressed both historic and cultural knowledge as well as the nature of the artist's work, that these two factors were most affected by the informative context comes as no surprise.

This finding is also in line with previous research. Leder et al. (2006) showed that presenting participants with elaborate titles increased their understanding of abstract paintings but did not affect their appreciation of the works. Swami (2013) further investigated these effects in a three-part study in which he explored viewer understanding and appreciation of artworks, both abstract and representational, in groups of participants who received varying levels of information. The results of his first study indicated that any contextual information compared to a control condition of no context increased viewer understanding of abstract works, but content-specific

information (as compared to titular or broadly relating information) led to overall greater understanding levels. Szubielska et al. (2021) found a similar effect for the understanding and appreciation of installation art.

These findings altogether support the psycho-historical approach proposed by Bullot and Reber (2013), which suggests that aesthetic experiences cannot be fully understood without their art-historical context. While this notion seems to be antithetical to the premise of slow looking, the two do not have to be mutually exclusive. Follow-up investigation to investigate whether a shorter viewing time would achieve the same impact on cultural engagement and understanding as the longer viewing time did could help disambiguate the relationship between the two.

**Other Ways to Slow Look?**

Though more than half of the Slow Art Day programming of 2020 featured mindfulness-based or open-ended viewing approaches (Slow Art Day, 2021), there was no significant impact of either the meditation or control condition on mood or aesthetic engagement in the present study, contrary to our original hypothesis. There are several possible explanations for these findings. Regarding the control condition, if an institution features only silent viewing, these instances are almost always followed by some kind of reflective activity, e.g. group discussion, whether in-person or through Zoom video calls, or a creative pursuit, such as note-taking or drawing (Slow Art Day, 2021). Thus, there may be a social element that must accompany solitary viewing, an idea supported by previous research regarding the positive influence of social behavior, e.g. conversation, on art reception for museum visitors (Tröndle et al., 2012). Alternatively, there may be a desire to produce or create a work of one's own after viewing, as has been supported by

various studies showing an increase in creativity following a study of artworks (Ishiguro & Okada, 2021; Parker, 2008; Pavlou, 2013).

Furthermore, though there has been evidence that style-related information (Belke et al., 2006) and mindfulness meditation (Zabelina et al., 2020) contribute to increased aesthetic appreciation, the majority of these studies are performed either within a museum or a laboratory context. Interacting with a laptop in an uncontrolled environment may not be enough to stimulate the emotional, perceptual, or experience categories that are directly associated with the meditation condition text. As level of experienced immersion in a virtual gallery visit has been to shown to mediate changes in emotion (Cotter et al., 2022), the present study may not have engaged that factor enough in its design. For this reason, these AEQ subscales may be harder to engage when not interacting face-to-face with a viewer, or perhaps are even completely unresponsive to general interventions, based more on trait mindfulness levels rather than state levels susceptible to training.

**Preference for the Representational**

In addition to its function as an ecologically valid design consideration, choice of image category resulted in several interesting implications. Firstly, of the total sample ($N$ = 141), 61 of the participants chose to view representational works as compared to photographic ($n$ = 37) or abstract ($n$ = 43) works. That the representational category was most selected for supports previous research that indicates a greater overall preference for representational art (Pihko et al., 2011; Uusitalo et al., 2012), especially without any contextual information (Moore & West, 2012). But this observation brings up the following question — were representational images

chosen more because of the general popularity and preference for this category or because participants deemed the works most suitable for the task of slow viewing? Shedding more light on this question, the results of our main effects analyses indicated that representational artworks significantly impacted cultural and flow experience subcategories of the AEQ while also leading to higher total engagement scores than either of the other two image categories. For this reason, representational art may be a better choice for slow viewing directives in galleries, although further investigation into this distinction is recommended — perhaps by having participants freely select works of different categories for different lengths of instructed viewing time.

Lastly, that there was no interaction effect between condition and category is a surprising observation as it has been shown that abstract works benefit from contextual information (akin to our historical condition) more so than representational ones, which do not show the same improvement (Leder et al., 2006). Swami (2013) confirmed this as well in the second part of his study — showing that context increased understanding and appreciation of abstract art but not representational art, suggesting overall that representational art requires less contextualization. While the present study found significant impacts of the representational image category on several engagement measures, that we did not find an interaction between the historical condition and the abstract category suggests that the benefit of information may not generalize to all kinds of abstract artworks.

**Attending to the Art**

Actual time spent viewing the images also emerged as an unexpected point of consideration in the analysis. While participants were meant to view each image for a minimum of 3 min, some

skipped one, two, or all three of the videos. The timing data, broken down by both condition and category, provides further interesting insight into viewer behavior. While we filtered out five participants in the control condition and four in the historical one, none were filtered out of the meditation condition. Brieber and colleagues (2014), in examining the relationship between the experience of art and time viewing the artworks, found that while viewing time increased with appreciation of the works, this was modulated by context. The researchers also found an effect of understanding, in that greater understanding of the works was linked to longer viewing times. The present study's information on timing dropouts can be examined in light of these findings in that the control condition, in which no context was given, had the greatest number of dropouts. But it is unexpected that the historical condition, which had the most amount of context, was next highest in this capacity. On the other hand, though, if viewing time is an indicator of viewing behavior or interest (Ishiguro et al., 2021), that the meditation condition only had one participant drop out and that this condition had higher median viewing times as compared to the control and historical condition (see Table 1) suggests that there may have been impacts on mood or engagement within this context that were undetected due to the online nature of the experiment.

**Limitations**

There are several notable limitations in this study. Firstly, as mentioned previously, this study did not have a non-slow-looking control condition, which could have better illuminated the particular impacts that slow looking, as opposed to just looking, may have on mood and engagement. Next, while the focusing exercise at the start of each video stimuli was implemented to combat loss of attention while doing an online task, as determined by the pilot

study, it could have contributed to the changes in mood observed across conditions or even obscured some of the possible effects of the meditation context in that it introduced a mindful approach to every video. Follow-up research on the impacts of this type of focusing intervention before viewing an artwork is thus recommended to help uncouple these two possible influences.

Finally, and perhaps most importantly — while this study is the first of its kind to examine slow looking in an online context, because of the viewing dropouts, an online survey may not be most suitable for this type of investigation. In addition to the general problems associated with web-based research such as inconsistent devices and user settings (for a review, see Wright, 2005), the conditions of the research question suggest that a museum-based or live setting could produce results that are closer to the usual experience of slow looking. Firstly, with regards to viewing behavior, participants tend to like artworks in a museum more, finding them more interesting, viewing them for longer times (Brieber et al., 2014), and subsequently recalling them better afterwards (Brieber et al., 2015). This leads to a better art experience in the museum (Grüner et al., 2019) when compared to laboratory settings, ultimately suggesting a contextual effect on cognitive and affective processes of art appreciation. Secondly, a 2016 review of the effectiveness of 15 randomized controlled trials examining the relationship between online mindfulness-based programs and mental health improvements reported that these programs have small but significant impacts on depression, anxiety, well-being, and mindfulness, with the biggest impact being on stress, with a moderate effect size (Spijkerman et al., 2016). If the most salient observed effect of virtual mindfulness interventions is stress reduction, then it follows that an online context would fail to engage some of the deeper cognitive and reflective processes involved in practicing a mindfulness-based approach alongside slow looking, even if an increase

in valence and reduction in arousal was found in all conditions. There is, therefore, a pressing need for researchers to investigate these questions within ecologically valid settings.

**Conclusion**

As researchers shed further light on the positive impacts of engagement with the arts (e.g., Fancourt & Finn, 2019), including art museum visitation (e.g., Thomson et al., 2018), empirical investigation into common art viewing approaches in cultural institutions becomes necessary. The practice of slow looking, or looking at an artwork for a prolonged period of time, often in tandem with guided instructions provided by a museum educator, has been adopted in both physical and online environments by international institutions for over a decade now but has not been systematically explored at the population level. The present online study is the first of its kind to explore the impacts of slow looking on short-term mood improvement and aesthetic experience in a large sample, while also investigating the influence of different guided approaches and image categories on the success of this type of viewing.

Though a follow-up investigation within a live, ecologically valid setting is currently ongoing to further probe the effects of the meditation condition on slow viewing and to better etch out the impacts of other live viewing factors, the present findings already suggest several important and exciting implications from this pioneering study. Firstly, slow viewing leads to improved mood, even in an online context. Secondly, the context of the viewing experience plays a role in the intensity and type of engagement, with evidence to support the continued use of the psycho-historical approach employed by museums already (Bullot & Reber, 2013). And lastly, some categories of art may be more suited for slow viewing, both in terms of initial viewer selection and in terms of greater impacts on engagement after the viewing period.

**Notes**

1. Other demographic-related questions regarding COVID-19 and isolation status were also asked but will be addressed in a separate paper.

**References**

Agostino, D., Arnaboldi, M., & Lampis, A. (2020). Italian state museums during the COVID-19 crisis: From onsite closure to online openness. *Museum Management and Curatorship*, *35*(4), 362–372.

Barrett, L. F., & Russell, J. A. (1999). The structure of current affect: Controversies and emerging consensus. *Current Directions in Psychological Science*, *8*(1), 10–14. https://doi.org/10.1111/1467-8721.00003

Belke, B., Leder, H., & AUGUSTIN, M. (2006). Mastering style – Effects of explicit style-related information, art knowledge and affective state on appreciation of abstract paintings. *Psychology Science*, *48*.

Binnie, J. (2010). Does viewing art in the museum reduce anxiety and Improve wellbeing? *Museums & Social Issues*, *5*(2), 191–201. https://doi.org/10.1179/msi.2010.5.2.191

[Box Breathing GIF]. (2019). *Healthline Media*. https://www.healthline.com/health/box-breathing

Brieber, D., Nadal, M., & Leder, H. (2015). In the white cube: Museum context enhances the valuation and memory of art. *Acta Psychologica*, *154*, 36–42. https://doi.org/10.1016/j.actpsy.2014.11.004

Brieber, D., Nadal, M., Leder, H., & Rosenberg, R. (2014). Art in time and space: Context modulates the relation between art experience and viewing time. *PLOS ONE*, *9*(6), e99019. https://doi.org/10.1371/journal.pone.0099019

Brinck, I. (2018). Empathy, engagement, entrainment: The interaction dynamics of aesthetic experience. *Cognitive Processing*, *19*(2), 201–213. https://doi.org/10.1007/s10339-017-0805-x

Bullot, N. J., & Reber, R. (2013). The artful mind meets art history: Toward a psycho-historical framework for the science of art appreciation. *Behavioral and Brain Sciences*, *36*(2), 123–137. https://doi.org/10.1017/S0140525X12000489

Burnham, R., & Kai-Kee, E. (2005). The art of teaching in the museum. *Journal of Aesthetic Education*, *39*(1), 65–76.

Carbon, C.-C. (2017). Art perception in the museum: How we spend time and space in art exhibitions. *I-Perception*, *8*(1), 2041669517694184. https://doi.org/10.1177/2041669517694184

Chamberlain, R., & Pepperell, R. (2021). Slow looking at slow art: The work of Pierre Bonnard. *Leonardo*, *54*(6), 615–618. https://doi.org/10.1162/leon_a_02054

Clark, T. J. (2006). *The Sight of Death: An Experiment in Art Writing*. Yale University Press.

Clow, A. (2006). *Normalisation of salivary cortisol levels and self-report stress by a brief lunchtime visit to an art gallery by London City workers*. *3*(2), 5.

Cohen, B. H. (2008). *Explaining Psychological Statistics*. John Wiley & Sons.

Collins, A. L., Sarkisian, N., & Winner, E. (2009). Flow and happiness in later life: An investigation into the role of daily and weekly flow experiences. *Journal of Happiness Studies*, *10*(6), 703–719. https://doi.org/10.1007/s10902-008-9116-3

Cotter, K. N., Harrouche, M., Rodriguez-Boerwinkle, R., Boerwinkle, M., Silvia, P., & Pawelski, J. (2022). *Virtual Art Visits: Examining the Effects of Slow Looking on Well-Being in an Online Environment* [Preprint]. PsyArXiv. https://doi.org/10.31234/osf.io/k5gje

Csikszentmihalyi, M., & Robinson, R. E. (1990). *The Art of Seeing: An Interpretation of the Aesthetic Encounter*. Getty Publications.

Cupchik, G. & Gebotys, R. (1988). The experience of pleasure, time, and interest during aesthetic episodes. *Empirical Studies of the Arts, 6*(1), 1–12. https://doi.org/10.2190/5YN3-J3P8-FWHY-UDB3

Cuypers, K. F., Knudtsen, M. S., Sandgren, M., Krokstad, S., Wikström, B. M., & Theorell, T. (2011). Cultural activities and public health: Research in Norway and Sweden. An overview. *Arts & Health, 3*(1), 6–26. https://doi.org/10.1080/17533015.2010.481288

Davis, J. (1996). *The MUSE Book: Museums Uniting with Schools in Education Building on Our Knowledge : a Report on the Work of Project MUSE*. Harvard College.

D'Cunha, N. M., McKune, A. J., Isbel, S., Kellett, J., Georgousopoulou, E. N., & Naumovski, N. (2019). Psychophysiological responses in people living with dementia after an art gallery intervention: An exploratory study. *Journal of Alzheimer's Disease, 72*(2), 549–562. https://doi.org/10.3233/JAD-190784

Demery, M. (1984). *The Art Appreciation Component of Visual Literacy: Examples of Guided Approaches to Viewing Art*.

Dewey, J. (1934). *Art as experience*.

Ding, X., Tang, Y.-Y., Tang, R., & Posner, M. I. (2014). Improving creativity performance by short-term meditation. *Behavioral and Brain Functions, 10*(1). https://doi.org/10.1186/1744-9081-10-9

Drake, J. E., Coleman, K., & Winner, E. (2011). Short-term mood repair through art: Effects of medium and strategy. *Art Therapy*, *28*(1), 26–30. https://doi.org/10.1080/07421656.2011.557032

Fancourt, D., & Finn, S. (2019). *What is the evidence on the role of the arts in improving health and well-being? A scoping review*. WHO Regional Office for Europe. http://www.ncbi.nlm.nih.gov/books/NBK553773/

Fancourt, D., & Steptoe, A. (2019a). Cultural engagement and mental health: Does socio-economic status explain the association? *Social Science & Medicine*, *236*, 112425. https://doi.org/10.1016/j.socscimed.2019.112425

Fancourt, D., & Steptoe, A. (2019b). The art of life and death: 14 year follow-up analyses of associations between arts engagement and mortality in the English Longitudinal Study of Ageing. *BMJ*, *367*, l6377. https://doi.org/10.1136/bmj.l6377

Fancourt, D., & Tymoszuk, U. (2019). Cultural engagement and incident depression in older adults: Evidence from the English Longitudinal Study of Ageing. *British Journal of Psychiatry*, *214*(4), 225–229. https://doi.org/10.1192/bjp.2018.267

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175–191. https://doi.org/10.3758/BF03193146

Feldman Barrett, L., & Russell, J. A. (1998). Independence and bipolarity in the structure of current affect. *Journal of Personality and Social Psychology*, *74*, 967–984. https://doi.org/10.1037/0022-3514.74.4.967

Fredrickson, B. L., & Branigan, C. (2005). Positive emotions broaden the scope of attention and thought-action repertoires. *Cognition and Emotion*, *19*(3), 313–332. https://doi.org/10.1080/02699930441000238

Funch, B. S. (2019). An Extended Look at Art. *Journal of Aesthetic Education*, *53*(1), 106–119.

Grossi, E., Tavano Blessi, G., & Sacco, P. L. (2019). Magic moments: Determinants of stress relief and subjective wellbeing from visiting a cultural heritage site. *Culture, Medicine, and Psychiatry*, *43*(1), 4–24. https://doi.org/10.1007/s11013-018-9593-8

Grüner, S., Specker, E., & Leder, H. (2019). Effects of context and genuineness in the experience of art. *Empirical Studies of the Arts*, *37*(2), 138–152. https://doi.org/10.1177/0276237418822896

Ho, R. T. H., Potash, J. S., Fang, F., & Rollins, J. (2015). Art viewing directives in hospital settings effect on mood. *HERD: Health Environments Research & Design Journal*, *8*(3), 30–43. https://doi.org/10.1177/1937586715575903

Housen, A. C. (2002). Æsthetic thought, critical thinking and transfer. *Arts and Learning Research*, *18*(1), 34.

Hubard, O. M. (2007). Productive information: Contextual knowledge in art museum education. *Art Education*, *60*(4), 17–23. https://doi.org/10.1080/00043125.2007.11651648

Ishiguro, C., & Okada, T. (2021). How does art viewing inspires creativity? *The Journal of Creative Behavior*, *55*(2), 489–500. https://doi.org/10.1002/jocb.469

Ishiguro, C., Takagishi, H., Sato, Y., Seow, A. W., Takahashi, A., Abe, Y., Hayashi, T., Kakizaki, H., Uno, K., Okada, H., & Kato, E. (2021). Effect of dialogical appreciation based on visual thinking strategies on art-viewing strategies. *Psychology of Aesthetics, Creativity, and the Arts*, *15*(1), 51–59. https://doi.org/10.1037/aca0000258

Ishiguro, C., Yokosawa, K., & Okada, T. (2016). Eye movements during art appreciation by students taking a photo creation course. *Frontiers in Psychology*, *7*. https://www.frontiersin.org/articles/10.3389/fpsyg.2016.01074

Ivcevic, Z., & Brackett, M. A. (2015). Predicting creativity: Interactive effects of openness to experience and emotion regulation ability. *Psychology of Aesthetics, Creativity, and the Arts*, *9*, 480–487. https://doi.org/10.1037/a0039826

Jedrczak, A., Beresford, M., & Clements, G. (1985). The TM-Sidhi program, pure consciousness, creativity and intelligence. *The Journal of Creative Behavior*, *19*, 270–275. https://doi.org/10.1002/j.2162-6057.1985.tb00409.x

Jucker, J.-L., Barrett, J. L., & Wlodarski, R. (2014). "I just don't get it": Perceived artists' intentions affect art evaluations. *Empirical Studies of the Arts*, *32*(2), 149–182.

Konlaan, B. B., Bygren, L. O., & Johansson, S.-E. (2000). Visiting the cinema, concerts, museums or art exhibitions as determinant of survival: A Swedish fourteen-year cohort follow-up. *Scandinavian Journal of Public Health*, *28*(3), 174–178. https://doi.org/10.1177/14034948000280030501

Kruger, J., Wirtz, D., Van Boven, L., & Altermatt, T. W. (2004). The effort heuristic. *Journal of Experimental Social Psychology*, *40*(1), 91–98. https://doi.org/10.1016/S0022-1031(03)00065-9

Lachapelle, R., Douesnard, M., & Keenlyside, E. (2009). Investigating assumptions about the relationship between viewing duration and better art appreciations. *Studies in Art Education*, *50*(3), 245–256. https://doi.org/10.1080/00393541.2009.11518771

Leder, H., Carbon, C.-C., & Ripsas, A.-L. (2006). Entitling art: Influence of title information on understanding and appreciation of paintings. *Acta Psychologica*, *121*(2), 176–198. https://doi.org/10.1016/j.actpsy.2005.08.005

Locher, P., Krupinski, E., & Schaefer, A. (2015). Art and authenticity: Behavioral and eye-movement analyses. *Psychology of Aesthetics, Creativity, and the Arts*, *9*(4), 356–367. https://doi.org/10.1037/aca0000026

Mak, H. W., Fluharty, M., & Fancourt, D. (2021). Predictors and impact of arts engagement during the COVID-19 pandemic: Analyses of data from 19,384 adults in the COVID-19 Social Study. *Frontiers in Psychology*, *12*. https://www.frontiersin.org/articles/10.3389/fpsyg.2021.626263

Marin, M. M., Lampatz, A., Wandl, M., & Leder, H. (2016). Berlyne revisited: Evidence for the multifaceted nature of hedonic tone in the appreciation of paintings and music. *Frontiers in Human Neuroscience, 10*. https://doi.org/10.3389/fnhum.2016.00536

Mastandrea, S., Fagioli, S., & Biasi, V. (2019). Art and psychological well-being: Linking the brain to the aesthetic emotion. *Frontiers in Psychology*, *10*. https://www.frontiersin.org/articles/10.3389/fpsyg.2019.00739

Mayer, M. M. (2005). A postmodern puzzle: Rewriting the place of the visitor in art museum education. *Studies in Art Education*, *46*(4), 356–368. https://doi.org/10.1080/00393541.2005.11651796

Moore, K. M., & West, A. N. (2012). Global perception, meaning, and aesthetic appreciation. *Empirical Studies of the Arts*, *30*(1), 23–38. https://doi.org/10.2190/EM.30.1.d

Parker, J. S. (2008). *The Impact of Visual Art Instruction On Student Creativity*. Walden University.

Pavlou, V. (2013). Investigating interrelations in visual arts education: Aesthetic enquiry, possibility thinking and creativity. *International Journal of Education Through Art*, *9*(1), 71–88. https://doi.org/10.1386/eta.9.1.71_1

Pihko, E., Virtanen, A., Saarinen, V.-M., Pannasch, S., Hirvenkari, L., Tossavainen, T., Haapala, A., & Hari, R. (2011). Experiencing art: The influence of expertise and painting abstraction level. *Frontiers in Human Neuroscience*, *5*. https://www.frontiersin.org/articles/10.3389/fnhum.2011.00094

Reed, A. (2017). *Slow Art: The Experience of Looking, Sacred Images to James Turrell*. Univ of California Press.

Rojas, M. del C. de, & Camarero, M. del C. (2006). Experience and satisfaction of visitors to museums and cultural exhibitions. *International Review on Public and Non Profit Marketing*, *3*(1), 49–65. https://doi.org/10.1007/BF02893284

Russell, J. A., Weiss, A., & Mendelsohn, G. A. (1989). Affect grid: A single-item scale of pleasure and arousal. *Journal of Personality and Social Psychology*, *57*(3).

Samaroudi, M., Echavarria, K. R., & Perry, L. (2020). Heritage in lockdown: Digital provision of memory institutions in the UK and US of America during the COVID-19 pandemic. *Museum Management and Curatorship*, *35*(4), 337–361. https://doi.org/10.1080/09647775.2020.1810483

Schall, A., Tesky, V. A., Adams, A.-K., & Pantel, J. (2018). Art museum-based intervention to promote emotional well-being and improve quality of life in people with dementia: The ARTEMIS project. *Dementia*, *17*(6), 728–743. https://doi.org/10.1177/1471301217730451

Schepman, A., Rodway, P., & Pullen, S. J. (2015). Greater cross-viewer similarity of semantic associations for representational than for abstract artworks. *Journal of Vision*, *15*(14), 12. https://doi.org/10.1167/15.14.12

Seifert, L. S., & Drennan, B. M. (2000). On the use of entry points to visual art. *Visual Arts Research*, *26*(2), 63–69.

Slow Art Day. (2021). *2020 Annual Report*.

Smith, J. K., & Smith, L. F. (2001). Spending time on art. *Empirical Studies of the Arts*, *19*(2), 229–236. https://doi.org/10.2190/5MQM-59JH-X21R-JN5J

Smith, L. F., Smith, J. K., & Tinio, P. P. L. (2017). Time spent viewing art and reading labels. *Psychology of Aesthetics, Creativity, and the Arts*, *11*(1), 77–85. https://doi.org/10.1037/aca0000049

Specker, E., Forster, M., Brinkmann, H., Boddy, J., Pelowski, M., Rosenberg, R., & Leder, H. (2020). The Vienna Art Interest and Art Knowledge Questionnaire (VAIAK): A unified and validated measure of art interest and art knowledge. *Psychology of Aesthetics, Creativity, and the Arts*, *14*(2), 172–185. https://doi.org/10.1037/aca0000205

Spijkerman, M. P. J., Pots, W. T. M., & Bohlmeijer, E. T. (2016). Effectiveness of online mindfulness-based interventions in improving mental health: A review and meta-analysis of randomised controlled trials. *Clinical Psychology Review*, *45*, 102–114. https://doi.org/10.1016/j.cpr.2016.03.009

Swami, V. (2013). Context matters: Investigating the impact of contextual information on aesthetic appreciation of paintings by Max Ernst and Pablo Picasso. *Psychology of Aesthetics, Creativity, and the Arts*, *7*(3), 285–295. https://doi.org/10.1037/a0030965

Szubielska, M., Francuz, P., Niestorowicz, E., & Bałaj, B. (2018). *The impact of reading or listening to a contextual information relating to contemporary paintings on the evaluation by non-experts in the field of art*. http://test-repozytorium.ukw.edu.pl//handle/item/5593

Szubielska, M., Imbir, K., & Szymańska, A. (2021). The influence of the physical context and knowledge of artworks on the aesthetic experience of interactive installations. *Current Psychology, 40*(8), 3702–3715. https://doi.org/10.1007/s12144-019-00322-w

Szubielska, M., & Sztorc, A. (2019). The influence of extended contextual information provided in a contemporary art gallery on aesthetic experience of art faculties students. *Polish Psychological Bulletin, 50*(4). https://doi.org/10.24425/PPB.2019.131316

Thayer, R. E., Newman, J. R., & McClain, T. M. (1994). Self-regulation of mood: Strategies for changing a bad mood, raising energy, and reducing tension. *Journal of Personality and Social Psychology, 67*, 910–925. https://doi.org/10.1037/0022-3514.67.5.910

Thomson, L. J., Lockyer, B., Camic, P. M., & Chatterjee, H. J. (2018). Effects of a museum-based social prescription intervention on quantitative measures of psychological wellbeing in older adults. *Perspectives in Public Health, 138*(1), 28–38. https://doi.org/10.1177/1757913917737563

Tishman, S. (2017). *Slow Looking: The Art and Practice of Learning Through Observation* (1st ed.). Routledge. https://doi.org/10.4324/9781315283814

Tröndle, M., Wintzerith, S., Wäspe, R., & Tschacher, W. (2012). A museum for the twenty-first century: The influence of 'sociality' on art reception in museum space. *Museum Management and Curatorship, 27*(5), 461–486. https://doi.org/10.1080/09647775.2012.737615

Trupp, M. D., Bignardi, G., Chana, K., Specker, E., & Pelowski, M. (2022). Can a brief interaction with online, digital art improve wellbeing? A comparative study of the impact of online art and culture presentations on mood, state-anxiety, subjective wellbeing, and loneliness. *Frontiers in Psychology*, *13*. https://www.frontiersin.org/articles/10.3389/fpsyg.2022.782033

Tschacher, W., Greenwood, S., Kirchberg, V., & Wintzerith, S. (2012). Physiological correlates of aesthetic perception of artworks in a museum. *Psychology of Aesthetics, Creativity, and the Arts*, *6*(1).

Unitt, C. (2020, May 7). Actually yes, people do want virtual museum tours. *Cultural Digital Newsletter*. https://www.chrisunitt.co.uk/2020/05/actually-yes-people-do-want-virtual-museum-tours/

Uusitalo, L., Simola, J., & Kuisma, J. (2012). Consumer Perception of Abstract and Representational Visual Art. *International Journal of Arts Management*, *15*(1), 13.

Väänänen, A., Murray, M., Koskinen, A., Vahtera, J., Kouvonen, A., & Kivimäki, M. (2009). Engagement in cultural activities and cause-specific mortality: Prospective cohort study. *Preventive Medicine*, *49*(2–3), 142–147. https://doi.org/10.1016/j.ypmed.2009.06.026

Vogt, S., & Magnussen, S. (2007). Expertise in pictorial perception: Eye-movement patterns and visual memory in artists and laymen. *Perception*, *36*(1), 91–100. https://doi.org/10.1068/p5262

Wanzer, D. L., Finley, K. P., Zarian, S., & Cortez, N. (2020). Experiencing flow while viewing art: Development of the Aesthetic Experience Questionnaire. *Psychology of Aesthetics, Creativity, and the Arts*, *14*(1), 113–124. https://doi.org/10.1037/aca0000203

Watson, D., & Tellegen, A. (1985). Toward a consensual structure of mood. *Psychological Bulletin, 98,* 219–235. https://doi.org/10.1037/0033-2909.98.2.219

Węziak-Białowolska, D., & Białowolski, P. (2016). Cultural events – does attendance improve health? Evidence from a Polish longitudinal study. *BMC Public Health*, *16*(1), 730. https://doi.org/10.1186/s12889-016-3433-y

Wilkinson, A. V., Waters, A. J., Bygren, L. O., & Tarlov, A. R. (2007). Are variations in rates of attending cultural activities associated with population health in the United States? *BMC Public Health*, *7*(1), 226. https://doi.org/10.1186/1471-2458-7-226

Wright, K. B. (2005). Researching Internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer-Mediated Communication*, *10*(3), JCMC1034. https://doi.org/10.1111/j.1083-6101.2005.tb00259.x

Zabelina, D. L., White, R. A., Tobin, A., & Thompson, L. (2020). The role of mindfulness in viewing and making art in children and adults. *Mindfulness*, *11*(11), 2604–2612. https://doi.org/10.1007/s12671-020-01474-8

Zangemeister, W. H., Sherman, K., & Stark, L. (1995). Evidence for a global scanpath strategy in viewing abstract compared with realistic images. *Neuropsychologia*, *33*(8), 1009–1025. https://doi.org/10.1016/0028-3932(95)00014-T