AWE: Aesthetic Well-being Evaluation

Mariola Paruzel-Czachura,

University of Silesia in Katowice, Poland &University of Pennsylvania, USA

&

Anjan Chatterjee

University of Pennsylvania, USA

December 4, 2024

Abstract: 150 words

Proposal: 3764 words without references and supplementary materials

Abstract

People engage with art as creators and observers. Despite this widespread engagement, understanding of how aesthetic experiences influence well-being, particularly across diverse cultural contexts, is limited. This study examines the relationship between art involvement and well-being through three hypotheses. First, it posits that greater engagement with art is positively associated with higher well-being. Second, it tests whether this relationship is moderated by cultural context. Third, it investigates whether different modes of engagement—observing versus creating art and in-person versus digital experiences—impact well-being differently. We aim to uncover the nuanced ways in which art contributes to well-being. We propose a large-scale study (AWE: Aesthetic Well-being Evaluation) encompassing (1) diverse forms of art engagement, ranging from appreciating visual art in galleries to creating culinary masterpieces (using the Assessment of Aesthetic Participation Scale) and (2) the PERMA model of well-being, which captures the dimensions of positive emotion, engagement, relationships, meaning, and accomplishment.

Keywords: aesthetics, art, well-being, beauty, digital

Art is not a luxury, but a necessity.

It elevates the mind, sustains the spirit,

and makes life more bearable.

Alain de Botton, “Art as Therapy”

Art has always captivated humanity. In 2023, the world’s 100 largest museums welcomed 176 million visitors (Cheshire & Da Silva, 2024). While defining art may be complex, it is clear that people engage with it on a deep level (Chatterjee, 2014; Winner, 2018). Humanity’s relationship with art dates at least back to the caves (McDermott, 2021) and has flourished through museums, galleries, churches, and public spaces (*Arts Attendance, Art-Making, and Social Connectedness: Spring/Summer 2024*, 2024). Recently, technology has further transformed how art is experienced (*Online Audiences for Arts Programming*, 2022). Virtual tours and platforms like Instagram have made art accessible to a global audience, breaking down geographical barriers to participation (Estrada-Gonzalez et al., 2020). Aesthetic experiences, however, are inherently complex, shaped by the artwork itself and the viewer’s personal history (Chatterjee & Vartanian, 2016). Furthermore, socio-cultural factors play a critical role in interpreting these experiences (Chatterjee & Vartanian, 2016; Juslin, 2013; Pelowski et al., 2017; Redies, 2015; Verpooten & Dewitte, 2017). The concept of “art” is rooted in a Western European tradition, underscoring the need for a broader, cross-cultural understanding of aesthetic engagement and its effects on well-being.

Research shows a positive relationship between art and well-being. Participation in artistic activities fosters personal growth by connecting people to their emotions and enhancing social, emotional, and cognitive well-being (Bolós et al., 2017; Lomas, 2016). Art can improve mood (Calderón-Garrido et al., 2018; Swindells et al., 2013). Additionally, the aesthetic experience might contribute to health (Gillam, 2018; Mastandrea et al., 2019). The

benefits of art on well-being are thought to occur in museums, healthcare settings, and education (Leckey, 2011; Mastandrea et al., 2019). For instance, participation in arts activities, such as Arts on Prescription programs, can increase motivation, sensory experiences, and emotional connections (Jensen & Torrissen, 2019). Artists demonstrate higher engagement with beauty and rate higher on the trait of happiness than non-artists (Zabihian & Diessner, 2016).

Over the past two decades, research into the effects of the arts on health and well-being has been growing, accompanied by developments in practice and policy across various countries, particularly within the WHO European Region. A WHO report synthesizes global evidence on the role of the arts in enhancing health outcomes, with a specific focus on Europe (Fancourt & Finn, 2019). Drawing from over 3,000 studies, the report highlights the arts' crucial role in preventing illness, promoting general health, and managing and treating diseases across the lifespan. The reviewed studies span various methodologies, including uncontrolled pilot studies, case studies, small-scale surveys, nationally representative longitudinal cohort studies, community ethnographies, and randomized controlled trials representing multiple disciplines. Together, these findings underscore the broad and likely multifaceted benefits of the arts.

However, the authors (Fancourt & Finn, 2019) emphasize that to realize these benefits fully, we must continue to build upon and expand the growing evidence base. Efforts include promoting greater arts engagement at the individual, local, and national levels and fostering cross-sectoral collaboration. The increasing body of literature underscores the substantial potential of the arts to contribute to public health and well-being, suggesting that further investment and action in this area could yield significant health benefits. While the connection between the arts and well-being is well-documented, much remains to be explored, especially

regarding the diversity of aesthetic experiences and their cultural contexts. For instance, some people enjoy visiting museums, while others prefer street murals or preparing a home-cooked meal. This project seeks to capture this diversity by examining a broad spectrum of aesthetic experiences, well-being, and cultural influences.

As individuals engage with aesthetics in many different forms, an important question arises: How does this engagement generally relate to well-being? How do cultural differences shape these experiences? Furthermore, does well-being differ depending on the type of activity involved? Are individuals equally fulfilled by creating art versus observing it? Does the medium—listening to music, getting a tattoo, or viewing paintings on Instagram—play a role? This study examines the relationship between art involvement and well-being through three hypotheses. First, it posits that greater engagement with art is positively associated with higher well-being. Second, it tests whether this relationship is moderated by cultural context. Third, it investigates whether different modes of engagement—observing versus creating art and in-person versus digital experiences—impact well-being differently.

We propose a large-scale PSA study spanning at least 50 countries to examine how cultural contexts influence art engagement and its effects on well-being. We adopt an inclusive definition of art, encompassing a range of activities such as observing tattoos, exploring Instagram paintings, or creating culinary masterpieces. We will use the Assessment of Aesthetic Participation Scale (Cardillo et al., 2024). Well-being will be assessed using the PERMA model (Butler & Kern, 2016; Seligman, 2011), a comprehensive framework encompassing five dimensions: positive emotion, engagement, relationships, meaning, and accomplishment.

Why is it essential to study aesthetic activity and well-being globally? Art uniquely can transcend boundaries, fostering personal growth, emotional well-being, and social

connection across diverse cultural contexts (Holt, 2018; Melchionne, 2017). The impact of art engagement on well-being is a growing area of interest in psychology, as it can contribute to flourishing lives by enhancing emotional regulation, promoting positive mental health, and encouraging resilience (Crone et al., 2013; Lomas, 2016). This study builds on this understanding by exploring how different forms of aesthetic engagement affect well-being in 50 countries, highlighting potential cultural and regional differences in art's role. As global art engagement continues evolving through technological and cultural shifts, this research can inform public policies and educational initiatives to foster community well-being and social cohesion. Understanding how art promotes happiness, resilience, and mental health globally is essential in a world where cultural exchange is increasingly common.

Aesthetic Participation

Traditional measures of arts engagement, such as the National Endowment for the Arts' Basic Survey (ABS) and the Survey of Public Participation in the Arts (SPPA), primarily focus on high-art activities within formal, institutional contexts. However, this limited scope fails to capture the diverse forms of aesthetic participation practiced by marginalized groups. Research indicates that individuals from racial minorities often engage with the arts in non-traditional spaces such as homes, libraries, community centers, and religious institutions, contexts largely overlooked by traditional surveys (Young & Goldstein, 2024). Additionally, the rapid growth of digital technologies has transformed art engagement, facilitating more personalized, accessible, and diverse forms of participation that are not fully represented in existing tools.

To address these gaps, we decided to use the Assessment of Aesthetic Participation (AAP), a new scale designed to encompass a broader range of artistic practices, both traditional and digital. The AAP aims to reduce the biases in conventional measures often

underreport engagement among marginalized groups and non-traditional art forms. The AAP provides a more inclusive measure of aesthetic participation by including crafting, cooking, tattooing, and community-based artistic engagement. It also captures art reception—such as viewing gallery exhibitions, listening to music, or reading literature—and production, including creating art, performing, and engaging in digital art experiences. This distinction highlights the spectrum of artistic involvement from passive consumption to active creation.

In addition, the AAP accounts for the growing importance of digital engagement, a trend that has reshaped how people experience art in the modern world (Hart, 2011; Luck & Sayer, 2024). Online activities like virtual museum tours, streaming services, and digital art platforms have broadened opportunities for artistic participation. Thus, by incorporating in-person and digital forms of engagement, the AAP offers a more comprehensive and nuanced perspective on how individuals interact with art, reflecting its evolving role in contemporary life.

Well-being

We propose using the PERMA model (Butler & Kern, 2016; Seligman, 2011), which includes five core elements of well-being: positive emotion (P), engagement (E), relationships (R), meaning (M), and accomplishment (A). It posits that flourishing individuals experience well-being through five distinct yet interrelated domains: Positive emotion emphasizes the importance of experiencing joy, gratitude, hope, and other positive emotions. While not the sole contributor to well-being, positive emotions provide a foundation for resilience and life satisfaction. They also enhance our capacity to build stronger relationships and find meaning in life. Engagement refers to being deeply involved in and absorbed by activities that match one's strengths and interests. This state, often called flow (Csikszentmihalyi et al., 2005), involves losing time and self-consciousness during an activity. Engagement is crucial for

personal growth and fulfillment. Relationships relate to satisfying and meaningful connections with others. Humans are inherently social beings, and strong, supportive relationships provide emotional sustenance, promote resilience, and create opportunities for shared positive experiences. Meaning comes from serving something larger than oneself. This might involve aligning with a personal purpose, contributing to a community, or pursuing spiritual or philosophical goals. A sense of meaning fosters motivation and a sense of direction in life. Accomplishment involves pursuing and achieving goals that are important to an individual. While not tied to external validation, striving for success and mastery builds self-efficacy, boosts confidence, and contributes to overall well-being.

The PERMA model has been widely applied in various contexts, including education, workplace well-being, healthcare, and community development. Its comprehensive nature allows for assessing multiple aspects of life, ensuring a holistic approach to well-being. The PERMA-Profiler (Butler & Kern, 2016) is a validated psychometric tool to measure each of the five domains. It consists of self-reported items assessing positive emotion, engagement, relationships, meaning, accomplishment, and overall well-being. The profiler is widely used in research and practice due to its reliability and ease of implementation. The PERMA model offers a holistic framework for understanding well-being, providing a balanced view that addresses both subjective experiences, such as positive emotions, and broader life dimensions, including relationships and meaning. This approach highlights the complexity of well-being and offers actionable insights. Individuals and organizations can tailor interventions to improve overall well-being by identifying specific areas of strength or weakness. Additionally, the model's versatility makes it adaptable across diverse populations and settings, allowing it to be applied in various disciplines and contexts to promote human flourishing.

Hypothesis

We plan to preregister a primary hypothesis proposing that aesthetic activity is associated with well-being. Specifically, we predict that higher levels of engagement in aesthetic activities will correlate with greater well-being.

In addition to this main hypothesis, we will conduct analyses to examine potential country-based differences in aesthetic activity and well-being and variations in well-being related to different forms of aesthetic engagement. This will allow us to explore whether the relationship between aesthetic activity and well-being is stronger in certain countries, whether art creation significantly impacts well-being more than art observation, or whether digital experiences differ from in-person ones. Moreover, we will test the influence of participant characteristics such as age and sex. These factors will be treated as exploratory, as their effects are less well-established and may be context-dependent, with the existing literature often presenting mixed findings. By keeping these analyses open-ended, we aim to capture new patterns and insights that might not conform to existing theoretical frameworks. This flexibility is crucial given these variables' complex, multifaceted nature and the potential for unexpected interactions. Ultimately, our exploratory analyses will help generate hypotheses for future research, shedding light on the diverse factors that shape the relationship between aesthetic activity and well-being.

Method

Open Materials

All the materials and data will be available at OSF, including the translation materials, codes in R, and the surveys. We will follow typical steps in past PSA projects where we participated as team members. We will preregister the study via OSF. Moreover, we aim for a

registered report in general of social psychology journals, starting with the one with the highest IF.

Participants

We aim to study adults aged 18 and older, with a preference for gender-balanced samples that vary in age and occupational status. While we do not expect to have fully representative samples, a convenience sample will suffice for this study. We do not intend to focus solely on students; rather, we aim to include diverse participants. For example, since we can incorporate variables such as education level or age as covariates in our analyses, having perfectly balanced samples in these areas is unnecessary. Our goal is to include data from at least 50 countries, though we will proceed with as many countries as we can recruit. We aim to collect data from 200 participants per country who pass all attention checks.

In addressing the potential issue of outliers and low art engagement, our approach will prioritize inclusivity and rigor without excluding participants unless they fail attention checks. We also want in our sample participants with lower art engagement. We recognize that art engagement can vary widely among individuals, and our research aims to study this diversity. Our understanding of art is broad, encompassing various forms of engagement, so we will include participants with varying levels of art involvement, including those with low engagement. While the research team may also attempt to recruit artists or individuals with a strong interest in art, this is not a criterion we intend to control for. Our goal is to focus on studying a wide range of participants to gain a comprehensive understanding of how art influences well-being across diverse engagement levels. If many participants report low art engagement, we will consider strategies to account for this in our analyses, such as examining it as a potential covariate or exploring its impact on our outcomes. This approach ensures that

our findings will reflect the experiences of a broad population, enhancing the ecological validity and generalizability of our results.

Procedure

We will conduct an online study via Qualtrics to deeply explore aesthetic engagement. Participants will first respond to questions about aesthetic activity and well-being. At the end, they will be asked about sociodemographic issues. The study is expected to take about 15-20 minutes. Each participant will complete the survey in their native language. Local teams will manage translation, following standard PSA procedures, including back-translation, tracking in Excel, and collaborative work led by a language coordinator. We will use Qualtrics' built-in feature to minimize missing data to require responses. Every collaborator (or team) will receive their unique link to Qualtrics, so we will ensure that all data collection is done the same way in every sample. If a collaborator does not have access to Qualtrics, this will not be a problem, as our lead team will be responsible for creating such links and copying the translated surveys into Qualtrics. All teams will be asked to confirm the survey quality before collecting data. All teams will receive documentation for ethical committees, or they can rely on our acceptance, just as in past PSA projects.

Measures

Aesthetic Activity. The study will use the Assessment of Aesthetic Participation Scale (Cardillo et al., 2024). It was designed to query a diverse and inclusive range of aesthetic activities, including fine arts, crafts, religious and heritage-based events, and new forms of participation afforded by evolving technology. This 40-item instrument consists of three subscales: Engagement-In Person, Engagement-Digital, and Creation and Performance. The Engagement subscales query the frequency with which respondents were consumers of 20 diverse aesthetic activities in the past 12 months, in-person and digitally (1 = *no*, 4 =

frequently). Sample activities include attending, viewing, or engaging with "Restaurants, food or drink tastings, food markets, or other culinary events as an aesthetic experience" and "Monuments, outdoor sculptures, murals, graffiti, street art, or other public art". The Creation and Performance subscale also contains 20 items, querying aesthetic activities in which respondents made or produced something. Examples include: "Did you play a musical instrument?" and "Did you use AI to create digital art, music, writing, performance, or designs?" Additionally, participants answer a single general question regarding the perceived importance of the arts to their health, well-being, and society (*no*/ *a little*/ *somewhat*/ *very*). See Supplementary Materials for the full survey. The sum is used to calculate the main score. The higher the score, the higher the aesthetic activity.

Well-being. We will use the PERMA Profiler to measure well-being, consisting of 23 items (Butler & Kern, 2016). The measure includes questions about health, negative emotions, loneliness, and overall happiness, which serve as filler items and provide additional context. While the 15 core PERMA questions (three per domain) can be used for brevity, we recommend using the full set of 23 items, as suggested by the scale's authors. All items are rated on an 11-point scale, where 0 represents *never,* and 10 represents *always*. This profiler evaluates five subscales: positive emotion (e.g., "How often do you feel joyful?"), engagement (e.g., "How often do you become absorbed in what you are doing?"), relationships (e.g., "To what extent do you feel loved?"), meaning (e.g., "To what extent do you feel your life has meaning?"), and accomplishment (e.g., "How often do you achieve important goals?"). The mean is used to calculate the main score. The higher the score, the higher the well-being. The scale has already been translated into many languages: https://www.peggykern.org/questionnaires.html

Sociodemographic. Participants will also report their demographic characteristics, including age, sex (female, male, other), sexual orientation, education, political views on social and economic issues, and religiosity. We will also ask about country and cultural issues. See the Supplementary Materials for the full survey.

Attention Checks. We will use attention checks to detect whether participants will engage throughout the survey. We will exclude participants who fail at least one out of two attention checks. They will be hidden in the study. Additionally, we will ask participants whether they believe their data was high-quality enough to be included in the survey (Curran, 2016). Their data will not be used if they answer negatively on this question.

Planned Statistical Analyses

We will use linear mixed-effects models to test whether the dependent variable (well-being) is influenced by aesthetic activity. First, we will treat the country as a random effect. This allows us to adjust for variability across countries, improving the model's generalizability. Next, we will test the country's differences, treating them as fixed effects. Next, we will test types of aesthetic activity and how they impact general well-being. These will be the three main models tested. To assess model fit, we will compute null models for comparison and use the Akaike information criterion (AIC) to evaluate out-of-sample prediction accuracy. We will test the following models to address our research questions (see Table 1).

Table 1

Research Questions and Planned Tested Main Models

Questions	**Models**
How does involvement in art relate to well-being?	well-being ~ activity + (1 | country)
Does culture shape this relationship?	well-being ~ activity * country

Does the type of engagement (observing versus creating, digital versus in-person) matter?	well-being ~ type + (1 | country)

We will also conduct separate analyses for all well-being and aesthetic activity dimensions. For instance, how is aesthetic activity related to relationships? (relationships ~ activity + (1 | country). Furthermore, we explore cross-country differences in all measured dimensions. Next, we will test all measured sociodemographic variables (e.g., political orientation, participants' age, and sex), treating them as other fixed effects. Of course, as we have a very detailed sociodemographic survey (see Supplementary Materials), we can extend these analyses using more detailed data, e.g., related to cultural minorities or races.

We plan to report results in tables to help with the readability. See the exemplary table below. We will account for multiple comparisons using the conservative Bonferroni correction. However, we remain open to adopting an alternative method if reviewers suggest it, either during the registered report review process or later stages of feedback.

Table 2

Example of Table

	β	***SE***	***t(df)***	***p***	$p_{\text{Bonferroni}}$
Activity	0.35556	0.04096	8.681(1492.86577)	.001	**.001**

Power Analysis

We conducted a power analysis in R using simulated data to evaluate the main model (Question 1, Table 1) and the model related to country differences (Question 2, Table 1). The full R code is provided in the Supplementary Materials. Our target sample includes data from at least 50 countries; however, the analysis assumes $N = 50$ countries with 200 participants per

country, totaling 10,000 participants. This simulation used an alpha level of 0.05 and a desired power of 80%. The results indicate that even 1,000 participants (across all countries) are sufficient to detect a small effect size of 0.005 in both models. However, because we plan to test multiple variables as fixed effects and explore interactions with activity, increasing the total sample size to 10,000 participants will enhance our ability to detect even small effect sizes. Please note that we will conduct the final power analysis when knowing how many countries will join the project.

Why This Project? Why Us?

This project explores the relationship between aesthetic activity and well-being, a topic with significant potential to enhance individual and societal health. Understanding how engagement in aesthetic activities—such as creating or appreciating art—affects well-being could provide valuable insights for improving the quality of life across diverse populations. While interest in this area has been growing, much of the existing research is limited in scope, often focusing on specific contexts. This leaves a gap in understanding how aesthetic activity influences well-being across different cultures and types of engagement.

We are particularly interested in addressing questions with practical implications for everyday life: How does engaging in activities like cooking a beautifully prepared meal, viewing art on a smartphone, or encountering murals on a walk to university impact our mental health and well-being? Can art truly make us more resilient as individuals?

Our research team consists of a diverse group of experts from two countries, encompassing various genders and racial backgrounds. The first author, an active member of the PSA, has extensive experience in leading large-scale collaborative projects and publications. Together, our team combines expertise in aesthetics, well-being, and psychological research, positioning us to address the complex relationships between these

areas effectively. Over the years, we have conducted numerous projects that explore the intersection of art, morality, and emotional responses, providing us with the specialized knowledge necessary to investigate this topic.

Moreover, we have access to Qualtrics and extensive experience in data analysis techniques, ensuring we can efficiently collect and analyze data related to aesthetic engagement and its impact on well-being. Our proficiency in data management and statistical analysis guarantees the rigor and reliability of our findings, enabling us to conduct meaningful cross-cultural comparisons and draw robust conclusions.

This project aims to deepen scientific understanding of how aesthetic activity influences well-being while fostering collaboration, procedural efficiency, and shared purpose among PSA members. Ultimately, we hope to advance scientific knowledge and collective development within the research community.

Thank you for taking the time to evaluate our proposal!

References

Arts Attendance, Art-Making, and Social Connectedness: Spring/Summer 2024. (2024). The National Endowment for the Arts. https://www.arts.gov/impact/research/publications/arts-attendance-art-making-and-social-connectedness-springsummer-2024

Bolós, A., Peláez, N. F., & Vicente, C. P. (2017). A Theoretical Approach to the Relationship between Art and Well-being. *Revista De Cercetare Si Interventie Sociala*. https://www.semanticscholar.org/paper/A-Theoretical-Approach-to-the-Relationship-between-Bol%C3%B3s-Pel%C3%A1ez/6ea36b1f709736af624b4bdeb42adea3a76152ff

Butler, J., & Kern, M. L. (2016). The PERMA-Profiler: A brief multidimensional measure of flourishing. *International Journal of Wellbeing*, *6*(3), 1–48. https://doi.org/10.5502/ijw.v6i3.526

Calderón-Garrido, D., Martín-Piñol, C., Gustems-Carnicer, J., & Portela-Fontán, A. (2018). La influencia de las Artes como motor de bienestar: Un estudio exploratorio. *Arte, Individuo y Sociedad*, *30*(1), 77–93. https://doi.org/10.5209/ARIS.56350

Chatterjee, A. (2014). *The Aesthetic Brain: How We Evolved to Desire Beauty and Enjoy Art*. OUP USA.

Chatterjee, A., & Vartanian, O. (2016). Neuroscience of aesthetics. *Annals of the New York Academy of Sciences*, *1369*(1), 172–194. https://doi.org/10.1111/nyas.13035

Cheshire, L., & Da Silva, J. (2024, March 17). *Exclusive: International museum attendance figures back to pre-pandemic levels.* The Art Newspaper - International Art News and Events. https://www.theartnewspaper.com/2024/03/17/museum-visitor-numbers-recover-from-pandemic-related-falls

Crone, D. M., O'Connell, E. E., Tyson, P. J., Clark‐Stone, F., Opher, S., & James, D. V. B. (2013). 'Art Lift' intervention to improve mental well‐being: An observational study from UK general practice. *International Journal of Mental Health Nursing*, *22*(3), 279–286. https://doi.org/10.1111/j.1447-0349.2012.00862.x

Curran, P. G. (2016). Methods for the detection of carelessly invalid responses in survey data. *Journal of Experimental Social Psychology*, *66*, 4–19. https://doi.org/10.1016/j.jesp.2015.07.006

Estrada-Gonzalez, V., East, S., Garbutt, M., & Spehar, B. (2020). Viewing Art in Different Contexts. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.00569

Fancourt, D., & Finn, S. (2019). *What is the evidence on the role of the arts in improving health and well-being? A scoping review*. World Health Organization. Regional Office for Europe. https://iris.who.int/handle/10665/329834

Gillam, T. (2018). Enhancing public mental health and wellbeing through creative arts participation. *Journal of Public Mental Health*, *17*(4), 148–156. https://doi.org/10.1108/JPMH-09-2018-0065

Hart, K. (2011). Art Project, Powered by Google. *The Charleston Advisor*, *13(2)*, 16–20. https://doi.org/10.5260/chara.13.2.16

Holt, N. J. (2018). Using the experience-sampling method to examine the psychological mechanisms by which participatory art improves wellbeing. *Perspectives in Public Health*, *138*(1), 55–65. https://doi.org/10.1177/1757913917739041

Jensen, A., & Torrissen, W. (2019). Aesthetic engagement as health and wellbeing promotion. *Journal of Public Mental Health*, *18*(4), 240–247. https://doi.org/10.1108/JPMH-11-2018-0080

Juslin, P. N. (2013). From everyday emotions to aesthetic emotions: Towards a unified theory of musical emotions. *Physics of Life Reviews*, *10*(3), 235–266. https://doi.org/10.1016/j.plrev.2013.05.008

Leckey, J. (2011). The therapeutic effectiveness of creative activities on mental well-being: A systematic review of the literature: Effectiveness of creative activities on mental well-being. *Journal of Psychiatric and Mental Health Nursing*, *18*(6), 501–509. https://doi.org/10.1111/j.1365-2850.2011.01693.x

Lomas, T. (2016). Positive Art: Artistic Expression and Appreciation as an Exemplary Vehicle for Flourishing. *Review of General Psychology*, *20*(2), 171–182. https://doi.org/10.1037/gpr0000073

Luck, A., & Sayer, F. (2024). Digital Engagement and Wellbeing: The Impact of Museum Digital Resources on User Wellbeing During COVID-19. *Heritage & Society*, *17(2)*, 169–190. https://doi.org/10.1080/2159032X.2023.2228173

Mastandrea, S., Fagioli, S., & Biasi, V. (2019). Art and Psychological Well-Being: Linking the Brain to the Aesthetic Emotion. *Frontiers in Psychology*, *10*, 739. https://doi.org/10.3389/fpsyg.2019.00739

McDermott, A. (2021). What was the first “art”? How would we know? *Proceedings of the National Academy of Sciences*, *118*(44), e2117561118. https://doi.org/10.1073/pnas.2117561118

Melchionne, K. (2017). Art and Well-Being. *Estetika: The European Journal of Aesthetics*, *54*(2), 189. https://doi.org/10.33134/eeja.163

Online Audiences for Arts Programming. (2022). The National Endowment for the Arts. https://www.arts.gov/impact/research/publications/online-audiences-arts-programming-survey-virtual-participation-amid-covid-19

Pelowski, M., Markey, P. S., Forster, M., Gerger, G., & Leder, H. (2017). Move me, astonish me… delight my eyes and brain: The Vienna Integrated Model of top-down and bottom-up processes in Art Perception (VIMAP) and corresponding affective, evaluative, and neurophysiological correlates. *Physics of Life Reviews*, *21*, 80–125. https://doi.org/10.1016/j.plrev.2017.02.003

Redies, C. (2015). Combining universal beauty and cultural context in a unifying model of visual aesthetic experience. *Frontiers in Human Neuroscience*, *9*. https://doi.org/10.3389/fnhum.2015.00218

Seligman, M. E. P. (2011). *Flourish: A visionary new understanding of happiness and well-being* (pp. xii, 349). Free Press.

Swindells, R., Lawthom, R., Rowley, K., Siddiquee, A., Kilroy, A., & Kagan, C. (2013). Eudaimonic well-being and community arts participation. *Perspectives in Public Health*, *133*(1), 60–65. https://doi.org/10.1177/1757913912466948

Verpooten, J., & Dewitte, S. (2017). The Conundrum of Modern Art. *Human Nature*, *28*(1), 16–38. https://doi.org/10.1007/s12110-016-9274-7

Winner, E. (2018). Can This Be Art? In E. Winner (Ed.), *How Art Works: A Psychological Exploration* (pp. 6–28). Oxford University Press. https://doi.org/10.1093/oso/9780190863357.003.0002

Young, D. L., & Goldstein, T. R. (2024). Racial-ethnic minority participants in the marching arts: Intergroup experiences, perceptions of inclusion, and well-being. *Psychology of Aesthetics, Creativity, and the Arts*, *18*(1), 74–82. https://doi.org/10.1037/aca0000614

Zabihian, S., & Diessner, R. (2016). *Engagement with Beauty and Levels of Happiness among Artists in the UK*. *16*, 1–9.

Supplementary Materials

Survey

Welcome to Our Study!
In this research, we're exploring how engaging with art relates to your well-being. The study will involve completing two surveys. One will ask about your experiences with art—how often you engage with art, what types of art you enjoy. The second will focus on your well-being. We are interested in your honest responses, as everyone's experience with art and well-being is unique. Your answers will help us understand the potential connection between aesthetic activity and well-being.
The study is anonymous and will take about fifteen minutes to complete. Ultimately, we will ask a few brief demographic questions to understand participants' diversity better.
If you agree to participate, please select "I agree" to begin.
Thank you for your time and valuable contribution!

Section 1: Assessment of Aesthetic Participation (AAP) Survey

A. Engagement

We are interested in your participation in aesthetic activities. For each activity, please indicate if you engaged in any of the following ways in the last 12 months:
In-person: You attended or participated in the activity in-person and offline. Do not include elementary, middle, or high school performances.
Digital: You participated by using a digital device to watch, listen to, virtually participate, and/or to download any programs, video, or audio content from live-stream or web-archived sources (for example, YouTube, an organization website, or social media platform). "Devices" mean things like computers, laptops, tablets, cell phones, other mobile devices, TV and radio, record-, cassette-, CD- and DVD-players.

During the last 12 months, did you attend, view, or engage with any...

1. Artworks or exhibits, such as painting, sculpture, film, photography, graphics, design, installations, textiles, wood, ceramics?

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

2. Music or concerts?

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

3. Dance performances?

In-person: No Rarely Sometimes Frequently

Digital: No Rarely Sometimes Frequently

4. Theatrical performances, such as musicals or plays?

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

5. Stand-up comedy performances, improv, magic shows, or circus acts?

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

6. Movies, film festivals, or screenings?

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

7. Readings, such as book-readings, story-tellings, poetry-readings, book groups, or library visits?

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

8. Literature, such as novels, poems, short stories, plays, graphic novels, comics? Consider audiobooks and e-books digital.

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

9. Non-fiction, including essays, articles, biographies, and memoirs. Consider audiobooks and e-books digital.

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

10. Restaurants, food or drink tastings, food markets, or other culinary events as an aesthetic experience? Consider cooking shows as digital.

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

11. Parks, cemeteries, gardens, or other natural spaces (forest, ocean, mountains, etc.) because of their historical, architectural, aesthetic, or design value?

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

12. Buildings or neighborhoods because of their historical, architectural, aesthetic, or design value?

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

13. Monuments, outdoor sculptures, murals, graffiti, street art, or other public art?

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

14. Craft fairs or arts festivals, conventions, or parades featuring performing artists, music, or art-making and crafts?

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

15. Cultural/heritage festivals, celebrations, or parades featuring performing artists, music, or traditional art-making and crafts?

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

16. Religious or spiritual celebrations, rituals, or services that involved music, dancing, or other artistic activities?

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

17. Season tickets to arts events, subscriptions to arts publications, or memberships in an arts organization?

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

18. Art acquisitions?

In-person: No Rarely Sometimes Frequently
Digital: No Rarely Sometimes Frequently

19. If you participated in any of the domains asked about in Q1-18, did you email, post to social media or websites, text, or otherwise **digitally share** information, pictures, videos, articles, or comments about the domain?

No Rarely Sometimes Frequently

20. If you participated in any of the domains asked about in Q1-18, did you take any classes, instructions, or lessons (in-person, live-streamed, or web-based), watch any videos, use any applications, listen to any podcasts/audiobooks, or receive instruction from someone you know to **further learn** about the domain?

No Rarely Sometimes Frequently

B. Creation and Performance

During the last 12 months did you...

1. Create visual art, such as paintings, sculpture, drawings, or graphic design?

No Rarely Sometimes Frequently

2. Create or edit any work of visual art, photographs, or videos using a computer or mobile device as an artistic activity?

No Rarely Sometimes Frequently

3. Play a musical instrument?

No Rarely Sometimes Frequently

4. Perform or practice singing?

No Rarely Sometimes Frequently

5. Compose, make, re-mix, or DJ any music?

No Rarely Sometimes Frequently

6. Use AI to create digital art, music, writing, performance, or designs?

No Rarely Sometimes Frequently

7. Perform or practice dancing, alone, partnered, or socially?

No Rarely Sometimes Frequently

8. Do any acting?

No Rarely Sometimes Frequently

9. Perform in stand-up comedy, improv, magic show, or circus acts?

No Rarely Sometimes Frequently

10. Get tattoos or body piercings or alter your appearance in permanent or semi-permanent ways as an artistic expression?

No Rarely Sometimes Frequently

11. Work with pottery, ceramics, glass, or jewelry?

No Rarely Sometimes Frequently

12. Do leatherwork, metalwork, or woodwork?

No Rarely Sometimes Frequently

13. Weave, crochet, quilt, needlepoint, knit, or sew?

No Rarely Sometimes Frequently

14. Do creative writing, such as fiction, non-fiction, poetry, plays, lyrics, journaling?

No Rarely Sometimes Frequently

15. Cook, make drinks (e.g., wine, beer, or cocktails) as an aesthetic activity?

No Rarely Sometimes Frequently

16. Work with indoor plants, garden for pleasure, or do any landscaping?

No Rarely Sometimes Frequently

17. Do any interior design, architectural design, or fashion design?

No Rarely Sometimes Frequently

18. Do projects in which you restored, rebuilt, or customized something (e.g., historic home, classic vehicle, furniture)?

No Rarely Sometimes Frequently

19. If you participated in any of the domains asked about in Q1-18, did you email, post to social media or websites, text, or otherwise **digitally share** the performances, artwork, and/or creative writing?

No Rarely Sometimes Frequently

20. If you participated in any of the domains asked about in Q1-18, did you take any classes or lessons (in-person, live-streamed, or web-based), watch any instructional videos, or listen to any educational podcasts/audiobooks to **further learn** about the domain?

No Rarely Sometimes Frequently

C. General

1. In general, do you believe the arts are important to your health, well-being, and society?

No A little Somewhat Very

Section 2: Well-being

Instruction: Below are questions about your well-being in various aspects of life. On a scale of 0 to 10 (the higher the number, the higher the rating), rate how often you feel particular states or feelings.

1. How often do you feel joyful? (0 = Never, 10 = Always)
2. To what extent do you feel contented? (0 = Not at all, 10 = Completely)
3. In general, how often do you feel positive? (0 = Never, 10 = Always)
4. How often do you become absorbed in what you are doing? (0 = Never, 10 = Always)
5. To what extent do you get excited about your daily activities? (0 = Not at all, 10 = Completely)

6. In general, to what extent do you feel interested in what you are doing? (0 = Not at all, 10 = Completely)
7. To what extent do you feel loved? (0 = Not at all, 10 = Completely)
8. How satisfied are you with your personal relationships? (0 = Not at all, 10 = Completely)
9. To what extent do you feel connected to others? (0 = Not at all, 10 = Completely)
10. In general, to what extent do you feel your life is valuable? (0 = Not at all, 10 = Completely)
11. To what extent do you feel your life has a sense of purpose? (0 = Not at all, 10 = Completely)
12. How often do you feel your life is meaningful? (0 = Never, 10 = Always)
13. How often do you achieve the things you set out to do? (0 = Never, 10 = Always)
14. To what extent are you making progress towards your goals? (0 = Not at all, 10 = Completely)
15. How often do you feel capable to accomplish what you want? (0 = Never, 10 = Always)
16. How often do you feel sad? (0 = Never, 10 = Always)
17. How often do you feel anxious? (0 = Never, 10 = Always)
18. How often do you feel angry? (0 = Never, 10 = Always)
19. How would you rate your physical health? (0 = Poor, 10 = Excellent)
20. To what extent are you satisfied with your physical health? (0 = Not at all, 10 = Completely)
21. How often do you feel healthy? (0 = Never, 10 = Always)
22. In general, how happy are you? (0 = Not at all, 10 = Completely)
23. Taking all things together, how satisfied are you with your life as a whole? (0 = Not at all, 10 = Completely)

Section 3: Sociodemographic Information

Instructions: Please complete the following demographic questions.

1. What is your age?

Response: [Type your answer as a whole number in years.]

2. What is your sex?

€ Female
€ Male
€ Other (please specify): _____

3. How would you describe your sexual orientation?

Response: [Select the option that best describes you.]

4. What is your highest level of education completed?

€ No formal education
€ Primary education
€ Secondary education
€ Associate's degree
€ Bachelor's degree
€ Master's degree
€ Doctoral degree
€ Other: _____

5. How would you describe your political views on social issues?

Scale: 1 (Very liberal) - 100 (Very conservative)

6. How would you describe your political views on economic issues?

Scale: 1 (Very liberal) - 100 (Very conservative)

7. Do you identify with a particular religion or spiritual practice?
   € Yes
   € No

If yes, please specify which religion or spiritual practice you follow:
[Open-ended or drop-down list of options]

8. Is religion/spirituality an important part of your life? 0 (not at all)-100 (very much)
9. To what extent are you a practicing person? 0 (not at all)-100 (very much)
10. What is your current country of residence?
    [Open-ended or drop-down list of countries]
11. In which country were you born?
    [Open-ended or drop-down list of countries]
12. What is your nationality (i.e., the country with which you are legally recognized)?
    [Open-ended or drop-down list of countries]
13. How do you identify yourself racially/ethnically? (Please select all that apply)
    € White/Caucasian
    € Black/African descent
    € Hispanic/Latino
    € Asian/Asian American
    € Middle Eastern
    € Indigenous/Native
    € Mixed Race
    € Other (please specify) _____
14. Please describe any cultural or ethnic heritage that is important to you (optional).
    [Open-ended text field]
15. What is your primary language spoken at home?
    [Open-ended or drop-down list of languages]
16. Do you speak any other languages fluently? (Select all that apply)
    [List of languages]
17. Have you ever lived in a country other than your country of birth or current residence?
    € Yes
    € No

If yes, please list the countries where you have lived and indicate the duration of each stay:
[Open-ended or drop-down list of options]

18. If you have lived in more than one country, what was the reason for your relocation? (Select all that apply)
    € Work
    € Education
    € Family reasons
    € Refugee/Asylum seeker
    € Other (please specify) _____
19. Were both of your parents born in the same country as you?
    € Yes
    € No
    € Not sure

If no, please specify where each parent was born:
[Open-ended or drop-down list of options]

20. Are you an immigrant or descendant of immigrants in your current country of residence?
- € Yes
- € No

If yes, please specify when your family moved to your current country of residence:
[Open-ended or drop-down list of options]

21. What is your current citizenship status in your country of residence?
- € Citizen
- € Permanent resident
- € Temporary resident
- € Other (please specify) _____

22. Do you consider yourself part of an ethnic or cultural minority group in your country of residence?
- € Yes
- € No

If yes, please specify which ethnic or cultural group:
[Open-ended text field]

23. Are you a member of any national, ethnic, or cultural organizations (e.g., clubs, societies, advocacy groups)?
- € Yes
- € No

If yes, please specify the organizations:
[Open-ended text field]

24. If you are a recent migrant, how long have you been living in your current country of residence?
- € Less than 1 year
- € 1–3 years
- € 4–5 years
- € 6 years or more

Section 5: Data Quality Self-Assessment

Instructions: Please indicate your perception of your data quality.

1. Do you believe your responses were of high enough quality to be included in this study?
- € Yes
- € No

Section 6: Attention Checks [hidden in the survey]

1. Rate and confirm you read this by choosing never.
2. Rate and confirm you read this by choosing zero.

Section 7: Debriefing

Thank you for participating in our study on the relationship between aesthetic activity and well-being. This research explores how engaging with art—whether through creation or observation—can impact various aspects of well-being, such as positive emotions, engagement, relationships, meaning, and accomplishment. We are particularly interested in understanding how different forms of aesthetic activity influence these elements and how they may vary across cultural contexts.

This study focused on the effects of engaging in aesthetic activities, such as creating or observing art, on individuals' overall well-being. Our goal is to understand better whether

higher levels of aesthetic engagement correlate with greater well-being and whether these effects differ depending on cultural background and individual characteristics such as age and gender.

By gathering data from participants in different countries, we aim to explore the cross-cultural variability in how aesthetic activities influence well-being. Our research seeks valuable insights into how art can contribute to psychological health, offering potential applications for improving well-being through aesthetic engagement in diverse settings.

If you have any questions or want to know more about the study, please get in touch with our research team at [email].

Thank you once again for your valuable participation in this important research!

R Code for Simulated Data and Power Analysis

Model 1

```
# Load necessary libraries
library(dplyr)
library(lme4)
library(lmerTest)
library(simr)

# Set seed for reproducibility
set.seed(123)

# Simulation parameters
num_countries <- 50              # Number of countries
participants_per_country <- 200   # Participants per country
total_participants <- num_countries * participants_per_country
scale_max_activity <- 240         # Maximum value for activity
scale_max_wellbeing <- 10         # Maximum value for well-being

# Generate the dataset
countries <- 1:num_countries
participants <- 1:total_participants
countries_rep <- rep(countries, each = participants_per_country)
activity <- runif(total_participants, 60, scale_max_activity)  # Activity ranging from 60 to 240

# Create a positive correlation with well-being
wellbeing <- 0.03 * activity + rnorm(total_participants, mean = 5, sd = 2)  # Positive correlation

# Ensure well-being is within the 0-10 scale
wellbeing <- pmax(0, pmin(scale_max_wellbeing, wellbeing))

# Add random country-level effects to well-being
country_effect <- rnorm(num_countries, mean = 0, sd = 1)
wellbeing <- wellbeing + country_effect[countries_rep]
```

```
# Create the dataframe
data <- data.frame(
  participant_id = participants,
  country = countries_rep,
  activity = activity,
  wellbeing = round(wellbeing, 1)
)

# Convert variables to factors
data <- data %>%
  mutate(
    country = factor(country)
  )

# Simulating model with one random effect (country)
model <- lmer(
  wellbeing ~ activity + (1 | country),  # Random effect: country
  data = data
)

# Update the fixed effect for a smaller effect size (e.g., 0.005)
small_effect_size <- 0.005
small_effect_model <- lmer(
  wellbeing ~ activity + (1 | country),  # Random effect: country
  data = data,
  start = list(fixef = c(Intercept = fixef(model)[1], activity = small_effect_size))
)

# Power Analysis
p_curve <- powerCurve(
  small_effect_model,
  test = fixed("activity", "t"),
  along = "participant_id",
  breaks = seq(1000, total_participants, by = 1000),
  nsim = 100  # Run 100 simulations per break point
)

# Plot the resulting power curve
plot(p_curve)

# Extract power values and sample sizes from the power curve
power_values <- sapply(p_curve$ps, function(x) {
  mean(x$pval <= x$alpha)
})
sample_sizes <- p_curve$xval

# Determine the sample size needed to achieve 80% power
```

```
index_80 <- which(power_values >= 0.80)[1]
if (!is.na(index_80)) {
  cat("The power reaches 80% with", sample_sizes[index_80], "participants.\n")
} else {
  cat("The power does not reach 80% with the tested number of participants.\n")
}

# Display the calculated power values and sample sizes
print(power_values)
print(sample_sizes)
```

Model 2

```
# Load necessary libraries
library(dplyr)
library(lme4)
library(lmerTest)
library(simr)

# Set seed for reproducibility
set.seed(123)

# Simulation parameters
num_countries <- 50              # Number of countries
participants_per_country <- 200   # Participants per country
total_participants <- num_countries * participants_per_country
scale_max_activity <- 240         # Maximum value for activity
scale_max_wellbeing <- 10         # Maximum value for well-being

# Generate the dataset
countries <- 1:num_countries
participants <- 1:total_participants
countries_rep <- rep(countries, each = participants_per_country)
activity <- runif(total_participants, 60, scale_max_activity)  # Activity ranging from
60 to 240

# Create a positive correlation with well-being
wellbeing <- 0.03 * activity + rnorm(total_participants, mean = 5, sd = 2)  # Positive
correlation

# Ensure well-being is within the 0-10 scale
wellbeing <- pmax(0, pmin(scale_max_wellbeing, wellbeing))

# Add random country-level effects to well-being (this step can be ignored since
country is now a fixed effect)
# country_effect <- rnorm(num_countries, mean = 0, sd = 1)
# wellbeing <- wellbeing + country_effect[countries_rep]
```

```
# Create the dataframe
data <- data.frame(
  participant_id = participants,
  country = countries_rep,
  activity = activity,
  wellbeing = round(wellbeing, 1)
)

# Convert variables to factors
data <- data %>%
  mutate(
    country = factor(country)
  )

# Simulating model with country as a fixed effect
model_fixed_country <- lm(
  wellbeing ~ activity + country,  # Country as a fixed effect
  data = data
)

# Update the fixed effect for a smaller effect size (e.g., 0.005)
small_effect_size <- 0.005
small_effect_model_fixed_country <- lm(
  wellbeing ~ activity + country,  # Country as a fixed effect
  data = data
)

# Power Analysis
p_curve <- powerCurve(
  small_effect_model_fixed_country,
  test = fixed("activity", "t"),
  along = "participant_id",
  breaks = seq(1000, total_participants, by = 1000),
  nsim = 100  # Run 100 simulations per break point
)

# Plot the resulting power curve
plot(p_curve)

# Extract power values and sample sizes from the power curve
power_values <- sapply(p_curve$ps, function(x) {
  mean(x$pval <= x$alpha)
})
sample_sizes <- p_curve$xval

# Determine the sample size needed to achieve 80% power
index_80 <- which(power_values >= 0.80)[1]
if (!is.na(index_80)) {
```

```
  cat("The power reaches 80% with", sample_sizes[index_80], "participants.\n")
} else {
  cat("The power does not reach 80% with the tested number of participants.\n")
}

# Display the calculated power values and sample sizes
print(power_values)
print(sample_sizes)
```