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Viewing challenging art lends meaning to life by stimulating integrative complexity

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ABSTRACT

What is the psychological value of consuming art? Four experiments tested whether and how art can lend meaning to life. This research relies on a rudimentary distinction between low art (presenting familiar objects in a simple, straightforward manner) and high art (presenting the same familiar objects with a dose of complexity). We predicted and found that high (vs. low) art elevates the sense that life has meaning, because it stimulates integrative complexity, a cognitive process in which disparate information is combined into unified, coherent representations. These integrated thoughts pique interest, leading to the sense of life's meaningfulness. Moreover, the results of two experiments point to the psychological benefits of viewing low (vs. high) art, namely the sense that life is happy. It seems that the relative lack of complex, integrated thoughts stimulated by low art, along with facilitated processing fluency, benefits positive feelings about one's life.

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Art; meaning; integrative complexity; happiness; processing fluency

Art is a crucial part of the human experience, having existed in every society on historical record (Dutton, 2009). The question of why art is important is as perplexing as art is enduring. Anthropologists depict art as enhancing the meaning of cultural activities (Dissanayake, 1992). Philosophers contend that art's ambiguity invites viewers to seek personal meaning (Andina, 2013). Pedagogical trends direct students to consider artworks' myriad interpretations (Grant & Patterson, 2016). More fundamentally, art appreciation seems rooted in the meaning people draw from it (Landau et al., 2006).

Scholars across disciplines therefore agree that some of art's value lies in its ability to enhance meaning. These conceptualizations, however, refer to meaning as interpreting the creative stimulus. The current research investigated whether some of art's benefits come from its ability to confer meaning to life itself.

We turned to a distinction in the art world between high and low art (Fisher, 2007). The distinction we focus on is not about the artwork's content (i.e., what is depicted) but instead about its artistic manner (i.e., how the content is depicted; Hagtvedt & Patrick, 2011a). Rather than delve into art-theoretical debates of what high or low art is, we rely on basic lay classifications of high versus low art (sometimes referred to as art vs. non-art) based on manner. In painting, for instance, the same content can be depicted in different manners

depending on how lines and colors are used (Hagtvedt & Patrick, 2011b). Low art tends to depict familiar objects in a simple and straightforward manner. High art may also depict familiar objects – and in our studies, the content is identical between conditions (Appendix) – but tends to introduce a dose of perceptual complexity. For example, a simplistic painting (low art) can depict the same content as a more intricate painting (high art). People can readily identify this distinction, as prior research (Lacey et al., 2011) and our studies demonstrate.

We hypothesized that viewing high art, compared to low art, would add to the sense that life has meaning. Whereas low art's straightforward manner may make it easier to immediately understand, high art's dose of complexity allows viewers to draw on their imagination and prior experiences to understand the piece (Zeki, 2001). If high art, more than low art, offers the chance for more connections to the artwork, then it could elevate meaning in life.

Meaning in life is grounded in making connections across time, space, and domains (Heine et al., 2006). For instance, people report more meaning in life after mentally linking their life right now to past, future, or counterfactual realities (Kray et al., 2010; Waytz et al., 2015). Comprehension, in which people form cohesive mental patterns across life events, is considered a pillar of meaning in life (George & Park, 2016). Drawing meaning from

stressful and challenging situations can even benefit – as opposed to harm – physiological well-being (Van Tongeren et al., 2017).

We drew on integrative complexity to test high art's ability to elicit cohesive connections and therefore enhance meaning in life. People display high integrative complexity when they engage cognitive processes that take disparate elements and make them into an elaborate whole while still retaining the disparate elements (Tetlock et al., 1985). That high art's openness to interpretation may stimulate integrative complexity was hinted at by Tetlock et al.'s (1993, p. 501) observation that 'unusual forms of art' should suit people with high integrative complexity. Our work not only went beyond mere speculation to formally test that connection, but we predicted that high art would spark more integrative complexity than low art, thereby adding to the sense that life has meaning.

Additionally, we aimed to test whether there also might be psychological benefits to viewing low art. We expected that the straightforward nature of low art should be associated with ease of processing (Reber et al., 2004), which is affectively pleasing (Reber et al., 1998). Given findings that pleasurable experiences tend to boost happiness (Baumeister et al., 2013), we predicted a sequence of influence from low art to happiness in life (through processing fluency).

The current experiments

Four experiments had people view an image depicting the same subject matter done in a high-art or low-art manner (Appendix). Leaving aside philosophical debates about what should qualify as high or low art, we relied on a basic operationalization: Whereas low art involves straightforward depictions (e.g., an ordinary photograph), high art involves a more complex artistic manner (Hagtvedt & Patrick, 2011b). Prior research has shown that people tend to identify high and low art consistent with this manipulation (Lacey et al., 2011).

A pilot study tested the prediction that high (vs. low) art would encourage integrative complexity. Experiment 1 tested the mediational pathway from artwork to integrative complexity to meaning in life, while also including interest as an intermediate variable between integrative complexity and meaning in life. Experiment 2, which was preregistered, aimed to replicate the prior findings, while also testing a potential benefit of viewing low art, namely happiness. Experiment 3 replicated prior findings, while manipulating available time; instead of measuring integrative complexity as a mediator, we constrained (vs. not) the ability to engage in it.

All stimuli, measures, and manipulations are reported here. There were no participant exclusions. Sample sizes were determined before analyzing the data. Data are available at OSF (https://osf.io/tjyw5/?view_only=f11bab26b3e449898976b457167b23cd).

Pilot study

Integrative complexity is observed when diverse information is combined into integrated ensembles while retaining the diversity of the elements. The pilot study tested the prediction that high, more than low, art would arouse integrative complexity, consistent with suggestions by Tetlock et al. (1993).

Method

Participants

One-hundred-twenty adults (70 male, 50 female; $M_{\text{age}} = 32$ years) sourced via Amazon's Mechanical Turk participated in a one-factor (high art vs. low art) between-subjects experiment in exchange for a small payment. According to G*Power analyses (Faul et al., 2007), the sample can detect an effect size of at least $f = .26$, given 80% power and an alpha of .05.

Procedure

Participants were randomly assigned to view a high-art image or low-art image of a man's face (Appendix). The image came onscreen and participants were instructed to write the thoughts and feelings that came to mind as they viewed it, using full sentences. Participants were given as long as they wanted to complete the task.

Two coders individually judged participants' writing (SOM). They used Tetlock et al.'s (1985) coding scheme, which combines differentiation and integration. High differentiation reflects a wide variety of thoughts and feelings. High integration reflects a unification of perspectives, seeing elements as interconnected. Ratings were averaged ($r = .90$).

Scores of 1 were given for low differentiation and integration. A sample response that was scored a 1: *The painting is pretty amazing. I love the style and intensity. The subject looks super sad.* Scores of 7 revealed strong differentiation and integration. This response was scored a 7: *Despite the general distortion, I'm struck by the clarity of the eyes. It's said that the eyes are the windows to the soul; I'm curious about a dichotomy between the eyes – clear, jarringly so – and the remainder of the head – distorted, in keeping with the surrounding background. Is this, perhaps, a question of the separation between body and soul, a statement on the marrings of the body not tarnishing the soul?*

Results

Main study

The main study tested the hypothesis that viewing high (vs. low) art would elicit thoughts reflecting greater integrative complexity. The results of an analysis of variance (ANOVA) supported the prediction ($M_{\text{high-art}} = 3.06$, $SD = 1.51$ vs. $M_{\text{low-art}} = 1.56$, $SD = .78$), $F(1, 118) = 45.91$, $p < .0005$, $\eta_p^2 = .28$, 95% CI = [1.07, 1.94].

Because the coding instructions included sample participant responses, we replicated the analysis without those responses. The pattern of results was unchanged: Viewing high art led to greater integrative complexity than viewing low art, as indicated by the results of an ANOVA

($M_{\text{high-art}} = 3.03$, $SD = 1.47$ vs. $M_{\text{low-art}} = 1.51$, $SD = .68$, $F(1, 114) = 50.85$, $p < .0005$, $\eta_p^2 = .31$, 95% CI = [1.10, 1.95]).

Additional analyses ensured that differences in integrative complexity were not due to differences in number of words written nor writing duration (SOM).

Stimulus test

We conducted a preregistered stimulus test (<https://aspredicted.org/blind.php?x=pt27du>) to assess whether the artwork shown in each condition corresponded to perceptions of high versus low art. Nothing from the stimulus test deviated from the preregistered plan.

Two hundred one adults (109 male, 89 female, 3 missing; $M_{\text{age}} = 38$ years) from Amazon's Mechanical Turk participated in a between-subjects experiment in which they viewed either the high-art or low-art image used in the main study. According to G*Power analyses, the sample can detect an effect size of at least $f = .20$, given 80% power and an alpha of .05.

Participants responded to three items: Is this visual image an example of low art or high art? (1 = Low art; 7 = High art). To what extent is this visual image an example of high art? (1 = Not at all high art; 7 = Definitely high art). To what extent is this visual image an example of low art? (1 = Not at all low art; 7 = Definitely low art [reverse coded]). Next, they reported gender and age. There were no further questions. The three items' scores were averaged to form a scale ($\alpha = .89$).

An ANOVA revealed the expected difference between the stimuli, with the high art image perceived as exemplifying high art more so than the low art image ($M_{\text{high-art}} = 4.81$, $SD = 1.39$ vs. $M_{\text{low-art}} = 3.56$, $SD = 1.41$, $F(1, 199) = 40.13$, $p < .0005$, $\eta_p^2 = .17$, 95% CI = [.86, 1.64]).

Experiment 1

Having demonstrated that viewing high art, more so than low art, inspired diverse and interconnected reflections, Experiment 1 tested whether that thought quality would boost perceived meaning in life. We predicted that it would. That is, we predicted that viewing high art (compared to low art) would elicit more integrative thoughts, thereby replicating the pilot study. Additionally, we predicted that viewing high (vs. low) art would increase ratings of life's meaningfulness, a novel hypothesis.

Experiment 1 also measured interest. Prior work has linked feelings of interest both to comprehensible complexity (i.e., novel stimuli that can be understood) and perceptions of meaningfulness (Silvia, 2008; Van Tilburg & Igou, 2017), hence having touchpoints to both the independent and dependent variables in the current investigation. Because complex, integrated thoughts are inherently interesting, we expected interest to be piqued by high art more so than low art. In other words, the mediational pathway should include interest as an intermediate variable between integrative complexity and meaning in life (i.e., artwork condition \rightarrow integrative complexity \rightarrow feelings of interest \rightarrow meaningfulness).

Method

Participants

One hundred twenty-one adults (77 male, 43 female, 1 missing; $M_{\text{age}} = 33$ years) sourced via Mechanical Turk participated in a one-factor (high-art vs. low-art) between-subjects experiment in exchange for a small payment. The target was 120 participants, but one additional participant was recorded, presumably due to an imperfectly timed cutoff. G*Power analyses revealed that the sample is adequate to detect an effect size of at least $f = .26$, given 80% power and an alpha of .05.

Procedure

Participants were randomly assigned to view a high-art or low-art image (adopted from Lacey et al., 2011; Appendix). The image remained viewable while answering questions.

Participants rated their agreement with three randomly-ordered statements: This type of image contributes meaning to my life; this image makes life seem meaningful; I feel a sense of meaningfulness when viewing this image (1 = Not at all, 7 = Definitely). Scores were averaged in a meaningfulness scale ($\alpha = .96$).

Next came two items aimed to measure interest. Participants indicated the extent to which they found the image interesting and how much it sparked curiosity (1 = Not at all, 7 = Definitely). Items were shown in a random order, and ratings were averaged ($r = .85$).

Then participants were instructed to use fully-formed sentences to report their thoughts and feelings in response to the image. Two coders separately rated the responses' degree of integrative complexity (SOM). Their scores were averaged ($r = .77$).

Last, participants completed a manipulation check by characterizing the image as low or high art (Low art = 1, High art = 7) and reported their gender and age. No other measures were collected.

Results

Manipulation check

Participants perceived that the images exemplified high versus low art in a manner consistent with their condition assignment

($M_{\text{high-art}} = 5.55$, $SD = 1.26$ vs. $M_{\text{low-art}} = 3.11$, $SD = 1.64$, $F(1, 119) = 85.13$, $p < .0005$, $\eta_p^2 = .42$, 95% CI = [1.92, 2.97]).

Meaningfulness

As predicted, viewing high art, as opposed to low art, produced a stronger sense that life is meaningful ($M_{\text{high-art}} = 3.82$, $SD = 1.79$ vs. $M_{\text{low-art}} = 3.01$, $SD = 1.58$, $F(1, 119) = 6.81$, $p = .01$, $\eta_p^2 = .05$, 95% CI = [.19, 1.42]).

Interest

Also as predicted, viewing high art sparked greater feelings of interest than did viewing low art ($M_{\text{high-art}} = 5.24$, $SD = 1.50$ vs. $M_{\text{low-art}} = 4.42$, $SD = 1.73$, $F(1, 119) = 7.83$, $p = .006$, $\eta_p^2 = .06$, 95% CI = [.24, 1.40]).

Integrative complexity

Replicating the pilot study's results, the high-art image, more than the low-art image, generated integrated, diverse thoughts

($M_{\text{high-art}} = 3.71$, $SD = 1.19$ vs. $M_{\text{low-art}} = 3.22$, $SD = .96$, $F(1, 119) = 6.18$, $p = .01$, $\eta_p^2 = .05$, 95% CI = [.10, .88]).

Mediation analysis

A bootstrap estimation (PROCESS model 6; Hayes, 2013; 10,000 resamples) confirmed a significant indirect effect of artwork condition on meaningfulness via integrative complexity, first, and then feelings of interest ($B = .14$, $SE = .07$, 95% CI = [.02, .31]). The direct effect

of condition on meaningfulness was non-significant ($B = .20$, $SE = .25$, 95% CI = [−.288, .683]). A mediation analysis with the two process variables in reverse positions did not fit the data (SOM). A simpler model that excluded interest (i.e., artwork condition → integrative complexity → meaningfulness) also fit the data (SOM).

Stimulus test

We conducted a preregistered confirmatory test to supplement the manipulation check (<https://aspre dictated.org/blind.php?x=6d3ss6>). No part of the study deviated from the preregistered plan. Two hundred adults (108 male, 91 female, 1 missing; $M_{\text{age}} = 36$ years) from Mechanical Turk participated in a between-subjects experiment, in which they viewed either the high-art or low-art image used in the main study. G*Power analyses revealed that the sample can detect an effect size of at least $f = .20$, given 80% power and an alpha of .05.

As in the pilot study, participants rated the extent to which the image is an example of: low art or high art (1 = Low art, 7 = High art); high art (1 = Not at all high art, 7 = Definitely high art); and low art (reverse-coded; 1 = Not at all low art, 7 = Definitely low art). Responses were averaged to form a scale ($\alpha = .93$). Next, they reported gender and age. There were no further questions.

Confirming expectations, the results of an ANOVA revealed the expected difference between the stimuli, $F(1, 198) = 80.55$, $p < .0005$, $\eta_p^2 = .29$, 95% CI = [1.41, 2.20]). The high art image was seen as more characteristic of high art than was the low art image ($M_{\text{high-art}} = 5.13$, $SD = 1.37$ vs. $M_{\text{low-art}} = 3.32$, $SD = 1.48$).

Discussion

Experiment 1 had three goals. One goal was to assess whether the effect of artwork condition affected thoughts' integrative complexity, as in the pilot study. Replicating those results, analyses of the thoughts inspired by the artwork showed that people who viewed high art, more so than low art, reported more complex, integrated cognitions.

A second goal was to assess whether artwork condition affected meaning in life, which it did. As expected, high art, more than low art, heightened perceptions that life has meaning. A third goal was to assess the mediational pathway accounting for the effect of artwork on meaning in life. In support of the proposed mediational pathway, viewing high art (versus low art) heightened meaning in life by evoking more coherent narratives made up of diverse impressions (integrative complexity), which piqued interest. As an additional finding, these

results indicate one potential reason why people find high art to be interesting, namely because it stimulates integrated, complex thoughts.

Experiment 2

Experiment 2 was a preregistered study (<https://aspre dictated.org/blind.php?x=pp6fe3>), chiefly aimed to test the replicability of the prior results. No part of the study deviated from the preregistered plan. We predicted that integrated thoughts (as seen in the pilot study and Experiment 1) and interest (as seen in Experiment 1) would sequentially mediate the effect of high (vs. low) art on perceived meaning in life (as seen in Experiment 1).

An additional focus was on the psychological benefits of low art. We expected that the straightforward nature of low art would be easy to process (Reber et al., 2004), and therefore emotionally pleasurable as well (Reber et al., 1998). Following from research linking the experience of positive feelings to a sense that life is happy (Baumeister et al., 2013), we predicted that viewing low art could influence perceptions of life's happiness through processing fluency. We had no prediction regarding the potential role of integrated thoughts in the effect of artwork on happiness. On the one hand, viewing low art could lead to shallower thinking, which in turn could improve happiness. On the other hand, complex thoughts might have little bearing on the link between art and happiness, resulting in a non-significant and non-mediating effect.

Method

Participants

One hundred eighty-six students (73 male, 113 female, $M_{\text{years}} = 20.5$) participated in a one-factor (art: high-art vs. low-art) between-subjects laboratory experiment for partial course credit. According to G*Power analyses, the sample can detect an effect size of at least $f = .21$, given 80% power and an alpha of .05.

Procedure

Participants were seated at lab computers running software that randomly assigned them to view a high-art or low-art image (Appendix; the stimuli were the same as in the pilot study, except we adjusted the facial expressions to be identical between conditions, since we were measuring happiness in Experiment 2). Stimuli were presented on-screen for the duration of the study, and participants completed paper questionnaires.

Participants reported perceived meaning and happiness in life, with question order randomized: This type of image contributes meaning (happiness) to my life; this image

makes life seem meaningful (happy); I feel a sense of meaningfulness (happiness) when viewing this image (1 = Not at all, 7 = Definitely). The three meaning ($\alpha = .88$) and three happiness ($\alpha = .91$) items were averaged to create scales.

Next, participants rated the extent to which the image was interesting, sparks curiosity, straightforward, and easy to understand (1 = Not at all, 7 = Definitely). The former two items were averaged to create an interest scale ($r = .82$), and the latter two items were averaged to form a processing fluency scale ($r = .71$).

To measure thought complexity, participants rated their agreement with four statements: The image inspired a lot of thoughts in me; When viewing the image, my thoughts were complex; The image sparked many different connections in my thoughts; When viewing the image, my thoughts were deep (1 = Not at all, 7 = Definitely; ratings were averaged; $\alpha = .95$). Last, participants completed a manipulation check by rating the image as low or high art (Low art = 1, High art = 7) and reported age and gender.

Results

Manipulation check

Participants perceived of the images in a manner consistent with their condition assignment. Those in the high-art condition rated that image as being a high-art image

($M_{\text{high-art}} = 4.39$, $SD = 1.52$) more so than participants in the low-art condition

($M_{\text{low-art}} = 2.59$, $SD = 1.22$, $F(1, 184) = 79.16$, $p < .0005$, $\eta_p^2 = .30$, 95% CI = [1.40, 2.19]).

Meaningfulness

Replicating Experiment 1's results, viewing high (vs. low) art engendered a stronger sense of meaning in life

($M_{\text{high-art}} = 2.73$, $SD = 1.36$ vs. $M_{\text{low-art}} = 1.73$, $SD = .94$, $F(1, 184) = 34.05$, $p < .0005$, $\eta_p^2 = .16$, 95% CI = [.66, 1.34]).

Happiness

As proposed, viewing low (vs. high) artwork engendered a stronger sense that life is happy

($M_{\text{low-art}} = 2.31$, $SD = 1.24$ vs. $M_{\text{high-art}} = 1.73$, $SD = .94$, $F(1, 184) = 12.73$, $p < .0005$, $\eta_p^2 = .07$, 95% CI = [.26, .90]).

Interest

Replicating Experiment 1, viewing high (vs. low) art sparked greater feelings of interest

($M_{\text{high-art}} = 4.69$, $SD = 1.56$ vs. $M_{\text{low-art}} = 2.75$, $SD = 1.27$, $F(1, 184) = 87.28$, $p < .0005$, $\eta_p^2 = .32$, 95% CI = [1.54, 2.36]).

Processing fluency

Participants processed the low (vs. high) artwork more fluently

($M_{\text{low-art}} = 4.62$, $SD = 1.50$ vs. $M_{\text{high-art}} = 3.33$, $SD = 1.40$, $F(1, 184) = 36.72$, $p < .0005$, $\eta_p^2 = .17$, 95% CI = [.87, 1.71]).

Complex thoughts

Replicating the pilot study and Experiment 1, viewing the high, as compared with the low, artwork sparked more complex thoughts

($M_{\text{high-art}} = 3.77$, $SD = 1.65$ vs. $M_{\text{low-art}} = 1.94$, $SD = 1.05$, $F(1, 184) = 81.99$, $p < .0005$, $\eta_p^2 = .31$, 95% CI = [1.43, 2.23]).

Mediation analysis

A bootstrap estimation with 10,000 resamples (PROCESS model 6; Hayes, 2013) tested the proposed mediation hypothesis for ratings of meaning in life. As predicted, and thus replicating Experiment 1, there was a significant indirect effect of artwork condition on meaningfulness via complex thoughts and feelings of interest ($B = .23$, $SE = .07$, 95% CI = [.10, .38]). The direct effect of condition on meaningfulness was non-significant ($B = -.14$, $SE = .16$, 95% CI = [-.46, .18]). The indirect effect via interest, on its own, also was significant ($B = .17$, $SE = .07$, 95% CI = [.07, .34]). Additionally, the indirect effect of artwork condition on meaningfulness was also significant for thought complexity ($B = .74$, $SE = .15$, 95% CI = [.48, 1.04]).

We conducted a similar bootstrap estimation with happiness ratings as the outcome. The results revealed a significant indirect effect of artwork condition on happiness, first via complex thoughts, then via processing fluency ($B = .07$, $SE = .04$, 95% CI = [.00, .16]). The direct effect of condition on happiness remained significant ($B = .87$, $SE = .16$, 95% CI = [-.46, .18]). The indirect effect via processing fluency, on its own, also was significant ($B = .25$, $SE = .09$, 95% CI = [.11, .47]), as was the indirect effect via complex thoughts ($B = -.61$, $SE = .11$, 95% CI = [-.86, -.43]). Although other models are possible, these models support mediation patterns consistent with the current theory.

Discussion

The primary aim of preregistered Experiment 2 was to test whether the results of the prior studies replicated. They did. High art, as opposed to low art, stimulated more complex thoughts (which replicates the pilot study and Experiment 1), was more aesthetically interesting, and led to a greater sense that life is meaningful (both of which

replicate Experiment 1's results). Experiment 1's mediational pathway from art image to complex thoughts to interest to meaningfulness was also replicated.

Experiment 2 additionally tested the psychological benefits of low art. Low art was easier to process and boosted reports of life's happiness. A mediation model showed that a relative lack of complex thoughts sparked by the image and easier processing fluency played mediational roles in the path from low (vs. high) art to life happiness.

Experiment 3

The prior two experiments showed that high art's effects on meaning in life relied on integrative complexity, which entails recognizing and blending diverse elements into cohesive wholes – a process that needs time to unfold (Suedfeld, Tetlock, & Streufert, 1992). In Experiment 3, we provided additional evidence for this process via moderation rather than mediation. Specifically, we tested the role of cognitive processing by curtailing the opportunity to use it for some viewers. With limited viewing time, high art's effects on meaning in life should be hampered, whereas ample time should reveal those effects (thus replicating Experiments 1–2). This theorizing amounts to an interaction prediction between artwork and time conditions. Viewing time differences should not disrupt low art's effects on happiness, because it is easily processed. We also predicted that Experiment 3 would replicate the mediating roles of interest and processing fluency demonstrated in Experiment 2.

Pretest

Fifty students (26 female, 24 male) from the same population as the main study participated in a between-subjects pretest. They viewed either the high-art or low-art image used in the main study (adopted from Lacey et al., 2011; Appendix) and rated the extent to which they considered the image to be an example of low art or high art (1 = Low art, 7 = High art).

The results of an ANOVA confirmed a successful manipulation. The high-art image was perceived as relatively higher art ($M = 6.12$, $SD = .97$) than the low-art image ($M = 3.48$, $SD = 1.85$, $F(1, 48) = 39.87$, $p < .0005$, $\eta_p^2 = .45$, 95% CI = [1.80, 3.48]).

Method

Participants

One hundred forty-six undergraduates (65 male, 81 female) participated in a 2 (art: high-art vs. low-art) x 2 (time: unconstrained vs. constrained) between-subjects

laboratory experiment in exchange for partial course credit. Sample size was based on Simmons, Nelson, and Simonsohn's (2011) recommendation of 20–30 per cell, which we aimed to exceed. All participants who signed up for the experiment were included.

Procedure

Participants were seated at lab computers running software that randomly assigned them to view the high-art or low-art image (Appendix). Some participants were given five seconds to view the image, after which the screen automatically advanced. Others were given as much time as they wanted, and the image remained onscreen while they completed the paper questionnaires.

Participants rated their perceptions of life's meaning and, separately, happiness. Five items measured meaning in life (Steger et al., 2006): I understand my life's meaning. I have a good sense of what makes my life meaningful. I have discovered a satisfying life purpose. My life has no clear purpose (reversed). My life has a clear sense of purpose (1 = Absolutely untrue, 7 = Absolutely true). Items were averaged ($\alpha = .89$).

Participants reported on their life's happiness using five statements worded to parallel the meaning items: I feel my life's happiness. I have a good sense of what makes my life happy. I have discovered a happy life. My life has no happiness (reversed). My life is clearly happy (1 = Absolutely untrue, 7 = Absolutely true). Items were averaged ($\alpha = .90$). The order of construct measures was counterbalanced.

Participants also completed measures of interest ($r = .79$) and fluency ($r = .80$) from Experiment 2. Last, participants reported their gender. No other measures were collected.

Results

Meaningfulness

The results of an ANOVA with artwork condition and time condition as independent variables and meaning in life as the dependent variable revealed the predicted interaction, $F(1, 142) = 6.72, p = .011, \eta_p^2 = .05$. As expected, when participants had ample time, viewing high art led to an elevated sense of meaning in life ($M = 5.18, SD = .96$), as compared to viewing low art ($M = 4.56, SD = 1.12, p = .019, 95\% CI = [.10, 1.13]$). With limited time, there was no difference between high art ($M = 4.34, SD = 1.19$) and low art ($M = 4.66, SD = 1.12, p = .20, 95\% CI = [-.84, .18]$). We also noted a difference between high art with ample time and high art with limited time ($p = .001, 95\% CI = [.33, 1.35]$) or low art with limited time ($p = .049, 95\% CI = [.00, 1.02]$). There

was a main effect of time condition ($M_{ample} = 4.87, SD = 1.08$ vs. $M_{limited} = 4.50, SD = 1.16, F(1, 142) = 4.10, p = .045, \eta_p^2 = .03, 95\% CI = [.01, .73]$), but not of artwork ($F(1, 142) = .62, p = .43$).

Happiness

An ANOVA with artwork and time conditions as predictors of happiness ratings showed that viewing low art ($M = 5.59, SD = .90$), compared to viewing high art ($M = 5.26, SD = 1.02$), led people to feel their lives were happier ($F(1, 142) = 4.17, p = .043, \eta_p^2 = .03, 95\% CI = [.01, .64]$), confirming the prior studies' results. There was no significant main effect of time ($F(1, 142) = .18, p = .67$) or artwork x time interaction ($F(1, 142) = .13, p = .72$).

Interest

A similar ANOVA on interest ratings showed a main effect of artwork ($F(1, 142) = 5.69, p = .018, \eta_p^2 = .04, 95\% CI = [.10, 1.10]$). Replicating the prior experiments, high art ($M = 5.19, SD = 1.54$) sparked more interest than low art ($M = 4.60, SD = 1.54$). There was no main effect of time condition ($F(1, 142) = .25, p = .62$).

The main effect of artwork was qualified by an artwork x time manipulation interaction ($F(1, 142) = 4.04, p = .046, \eta_p^2 = .03$). High art with ample time sparked significantly more interest ($M = 5.51, SD = 1.16$) than low art with ample time ($M = 4.40, SD = 1.67, p = .002, 95\% CI = [.40, 1.82]$). We also noted that high art with ample time sparked more interest than low art with limited time ($M = 4.78, SD = 1.39, p = .04, 95\% CI = [.02, 1.44]$), but only marginally more interest than high art with limited time ($M = 4.88, SD = 1.80, p = .08, 95\% CI = [-.07, 1.34]$). Viewing high art with limited time did not spark more interest than low art with ample time ($p = .25, 95\% CI = [-.34, 1.29]$) or low art with limited time ($p = .80, 95\% CI = [-.65, .84]$).

Processing fluency

An ANOVA with artwork condition and time condition on ratings of fluency confirmed the findings of the prior studies in showing a main effect of artwork condition, $F(1, 142) = 11.16, p = .001, \eta_p^2 = .07, 95\% CI = [.30, 1.18]$. As expected, participants reported that the low artwork was more fluently processed ($M = 5.28, SD = 1.22$) than the high artwork ($M = 4.54, SD = 1.43$). The main effect of time condition, $F(1, 142) = .23, p = .63$, and the interaction, $F(1, 142) = .01, p = .91$, were nonsignificant.

Mediation analyses

Mediation analyses tested the prediction that high art, more than low art, aids perceptions of meaning in life via feelings of interest. Processing fluency also was entered into the model to test whether interest uniquely

accounted for changes in meaning in life. Time condition served as a moderating variable of the effect of artwork condition on meaningfulness as well as on interest. Analyses were conducted using a custom PROCESS model (Hayes, 2013; 10,000 resamples). In support of hypotheses, the indirect effect of artwork condition on meaningfulness via interest was significant in the ample time condition ($B = .27$, $SE = .11$, $95\% CI = [.09, .51]$) but not in the limited time condition ($B = .02$, $SE = .09$, $95\% CI = [-.18, .20]$). Fluency was not an explanatory factor ($B = -.07$, $SE = .06$, $95\% CI = [-.22, .03]$). The conditional direct effect was nonsignificant for both time conditions (ample: $95\% CI = [-.09, .92]$; limited: $95\% CI = [-.77, .20]$).

We used the same model to predict happiness ratings. Fluency explained the effect of artwork condition on happiness ($B = .09$, $SE = .06$, $95\% CI = [.00, .22]$), as did interest in the ample time condition ($B = -.21$, $SE = .09$, $95\% CI = [-.42, -.05]$) but not in the limited time condition ($B = -.02$, $SE = .07$, $95\% CI = [-.16, .14]$). The conditional direct effect of artwork condition on happiness remained significant in the ample time condition ($95\% CI = [.05, .98]$), and not in the limited time condition ($95\% CI = [-.23, .63]$).

Discussion

Experiment 3 used a time manipulation to demonstrate that high art's effect on meaning in life requires the opportunity to process it. Without much viewing time, people's lives felt similarly meaningful whether they viewed high or low art, and the artwork equivalently interesting. As a minor observation, we noted that within the high-art condition, the interest sparked was only marginally different between time conditions, perhaps suggesting that not all sources of interest rely on processing time. More importantly, with ample time to process, high art boosted meaning in life and stoked aesthetic interest, as compared to low art. As predicted, irrespective of little or ample viewing time, low art aided perceptions of life's happiness and was easily processed, as compared with high art.

Experiment 3 used a measure for meaning in life from the literature (Steger et al., 2006) and a parallel set of items for happiness. We made this change to test whether the effects would hold without explicitly mentioning the art image. They did, although the effect sizes were smaller as compared to the prior ones.

General discussion

Why does art matter in people's lives? Consuming art may spark thoughts, evoke feelings, or provide fodder for conversation. We tested a novel outcome: imbuing

life with meaning. In our studies, perceptually-challenging art (termed high art), more so than straightforward art (low art), enhanced the sense that life has meaning (Experiments 1–3). It did so by stimulating complex and coherent thought patterns (Pilot Study, Experiments 1–2) and feelings of interest in the artwork (Experiments 1–3). The effects were observed with online and student samples, using different instantiations of high and low artwork, and in a preregistered confirmatory experiment. It should be noted that we did not include a neutral control condition in our studies, so it is possible that rather than high art elevating the sense of meaning in life, low art could be detracting from it. Relatedly, the means in Experiment 3 were somewhat low compared with those found in other data sets (Heintzelman & King, 2014). Our focus was on the differential influence of the two types of art, but future work might compare the impact of artworks with that of stimuli unrelated to art.

What is it that high art seems to do, psychologically? We focused on its ability to conjure up diverse yet interwoven thoughts, leaning on Tetlock and colleagues' notion of integrative complexity (Tetlock et al., 1985). Integrative complexity encompasses people's capacity for tolerating ambiguity, combining divergent perspectives, and appreciating nuanced accounts of the world (e.g., Tetlock et al., 1993). High art's modicum of perceptual fuzziness in how the subject matter is presented, relative to the straightforward presentational style of low art, seems to provide the basis for such interwoven thought. Not incidentally, the notion of integrative complexity is highly consistent with a dimension, termed comprehension, thought to underlie meaning in life. Comprehension involves making sense of disparate life events and experiences and coming to a coherent understanding (George & Park, 2016; Martela & Steger, 2016). Theoretical links between integrative complexity and the comprehension component of meaning in life may warrant attention in future work.

Additionally, the current findings suggested a psychological benefit to low art. Low art, more than high art, provided boosts in happiness (Experiments 2–3). Thus, this paper joins recent research that distinguishes between meaning and happiness in life (Baumeister et al., 2013). It seems that the relative lack of complex, integrated thoughts that are stimulated by low art, along with facilitated processing fluency, befits positive feelings about one's life and the state of the world. This latter finding fits well with the established role of processing fluency in aesthetic pleasure (Reber et al., 2004) and affectively positive responses (Reber et al., 1998), while suggesting that the influence of processing fluency may extend to perceived happiness in life, too.

The current findings also have implications for interest, a motivational factor. While theory and research have suggested that some degree of ambiguity in artwork can spark curiosity and interest (Berlyne, 1974; Muth et al., 2015; Zeki, 2001), the psychological underpinning for art-related interest is not thoroughly understood. The results of two experiments here point to the complexity of thoughts inspired by the artwork as potentially playing a central role.

Meaning in life's empirical basis is growing, albeit largely with correlational evidence (for a review, George & Park, 2016). Our experiments stand among the few providing causal evidence. Included in that set are experiments showing that exposure to surreal art, with its bizarre and often nonsensical relations among the depicted objects, deprives people of meaning (Proulx et al., 2010). Altogether, those and the current results underscore the psychological power of art to alter meaning in life. Germane to the current findings, artwork containing a dose of perceptual ambiguity may be a sweet spot – eliciting nuanced mental musings, evoking curiosity and interest, and bolstering the sense that life is meaningful.

Open Practices

All stimuli, measures, and manipulations are reported in this manuscript. There were no participant exclusions. Sample sizes were determined before analyzing the data. Data are available at OSF (https://osf.io/tjyw5/?view_only=f11bab26b3e449898976b457167b23cd). We also had three preregistrations: stimulus tests for the pilot study (<https://aspredicted.org/blind.php?x=pt27du>) and Experiment 1 (<https://aspredicted.org/blind.php?x=6d3ss6>), and Experiment 2's main study (<https://aspredicted.org/blind.php?x=pp6fe3>).

Ethics Approval and Consent

Ethics approval provided by IRB (via Boston College; protocol number: 10.052.01e). Consent provided by participants (via consent form) prior to data collection.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability statement

The data described in this article are openly available in the Open Science Framework at <https://doi.org/10.17605/OSF.IO/TPA6U>.

Open Scholarship



This article has earned the Center for Open Science badges for Open Data, Open Materials and Preregistered. The data and materials are openly accessible at <https://doi.org/10.17605/OSF.IO/TPA6U>.

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Appendix

Low-art (L) and High-art (R) stimuli

Pilot Study

Experiment 1

Experiment 2

Experiment 3



