



Artistic expertise and multidimensional aesthetic engagement across four impressionist, expressionist, cubist, and surrealist paintings

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Abstract

Previous research has shown that individuals with artistic expertise often engage with visual art differently from non-experts. However, few studies have examined whether these differences vary across artistic styles when subject matter is held constant. This exploratory pilot study examined aesthetic engagement among 44 George Mason University students (8 art majors, 36 non-art majors) viewing four original paintings depicting the same subject—a woman holding a flower—recreated in the styles of Impressionism, Expressionism, Cubism, and Surrealism. Participants completed a survey adapted from the Aesthetic Experience Questionnaire and provided qualitative commentary. Responses were aggregated into five dimensions of aesthetic engagement: emotion, reward, immersion, focus, and understanding. Art majors reported stronger engagement than non-art majors across most dimensions, with the largest differences observed for the Cubist painting. Expertise-related differences varied across artistic styles and engagement dimensions, with focus and emotion showing the strongest average effects. Cubist and Expressionist paintings produced the largest overall expertise-related differences, whereas Impressionist and Surrealist paintings exhibited smaller divergences. Qualitative responses indicated that art majors more frequently discussed symbolism, artistic techniques, and stylistic characteristics, whereas non-art majors emphasized personal preferences and immediate reactions. Together, the findings suggest that artistic expertise was associated with differences not only in the magnitude but also in the character of reported aesthetic engagement across artistic styles. To the author's knowledge, this study is among the first to compare expertise-related differences across Impressionist, Expressionist, Cubist, and Surrealist renderings of the same subject. By evaluating emotion, reward, immersion, focus, and understanding separately, the study offers a broader, more nuanced framework for investigating aesthetic experience. Because only one self-created painting represented each style, the findings should be interpreted as exploratory and limited to the artworks examined. Nevertheless, the results provide preliminary evidence that artistic style may influence expertise-related differences across multiple dimensions of aesthetic engagement, warranting broader future studies.

Keywords

Aesthetic engagement, Art expertise, Art perception, Visual cognition, Aesthetic experience, Artistic style, Impressionism, Expressionism, Cubism, Surrealism

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1. Introduction

A large body of literature suggests that art expertise plays an important role in art engagement. Nodine et al was among the first to explore this relationship in 1993, finding that art experts are more likely to examine the background of art pieces than non-experts (1). Later studies have further examined this relationship by manipulating the abstraction of art, or its departure from realistic representation. In these studies, researchers surveyed art experts and non-experts to compare their responses to artworks varying in abstraction level, consistently finding that, while both groups differ in how they engage with art, the extent and nature of these differences depend on the level of abstraction. Experts show more consistency, whereas non-experts' engagements tend to shift more with increasing abstraction. The umbrella term of abstract art was shaped by ideas of rebellion and uniqueness that arose from the Impressionism, Expressionism, Cubism, and Surrealism art movements, each carrying their own set of abstract elements.

Despite the many studies that have compared the engagement of art experts and non-experts when examining art at a range of abstraction, no studies have distinguished abstract art based on its style and characteristics, specifically into the historical art styles that have set the foundations for the development of abstraction: Impressionism, Expressionism, Cubism, and Surrealism. This is worth exploring, because evidence indicates that art experts engage with art differently from non-experts. Understanding the implications of this difference would help artists understand how different demographics may react to art and to help psychologists

understand how expertise impacts aesthetic engagement. Thus, this pilot study seeks to determine whether art majors aesthetically engage with a certain art piece recreated with the styles of Impressionism, Expressionism, Cubism, and Surrealism differently from non-art majors. This preliminary literature review will explore how Impressionism, Expressionism, Cubism, and Surrealism shaped the development of abstract art, examine three studies on expert aesthetic engagement of abstract art, and then examine those same studies on non-expert aesthetic engagement.

1.1 Impressionism, Expressionism, Cubism, and Surrealism shaping abstraction

In late 19th century France, Claude Monet pioneered the Impressionism movement with his painting *Impressionism, Sunrise*, which includes novel characteristics like unmixed brush strokes, dynamic movement, and emphasized light depiction, deviating away from the standards of realism and staged composition (2). In a historical analysis, art curator William Seitz (1956) described Monet's impact on abstract art: "...in probing the essences of his motifs, pulling them forward toward the picture plane, and interpreting them in rhythmic brushstrokes and coloristic pulsation, he was instrumental in establishing the relativistic and vitalistic principles of abstract painting as we know it today." (p. 46). Impressionism later inspired Expressionism in Germany, an art style that emphasizes the expression of emotion through art (3). Paul explains how Expressionism helped integrate emotions into abstract art: "...the artists made monumentally scaled works that stood as reflections of their individual psyches, and in

doing so, attempted to tap into universal inner sources.”

Inspired by the innovative purposes of Impressionism and Expressionism, artists Pablo Picasso and Georges Braque developed Cubism in the early 20th century (4). In his book, *Cubism and Abstract Art*, art historian Alfred Barr describes how Picasso and Braque initiated Cubism by creating unrealistic artworks such as *Arlesienne*, which are made up of, “flat, overlapping, transparent planes, almost rectangular in shape” (p. 31). The ambiguity of these styles later inspired Surrealism, a 1920s French movement that manifested overly irrational and illogical ideas into art, inspired by psychological theories based on the subconscious mind by Sigmund Freud and Carl Jung (5). Unlike the other three styles, Surrealism was not characterized by visual elements like color, brush strokes, and lines; rather, it was more recognized for its incorporation of dreamlike subjects. Ultimately, Impressionism, Expressionism, Cubism, and Surrealism each uniquely shaped abstract art, and examining the aesthetic engagements with an art piece recreated in those styles may provide preliminary evidence explaining the specific elements that underlie the variance in abstract art engagement.

1.2 Expert interpretation of abstract art

Professor of Empirical Aesthetics in Psychology Dr. Augustin and her research team grouped participants into art experts and non-experts: 30 art history students and 30 psychology students (6). The groups were told to categorize a large selection of paintings with a range of abstraction. The art experts were more likely to

categorize the art pieces based on style, such as representational versus abstract, and the artists’ intentions, such as expressive versus intuitive. This suggests that art experts find different commonalities between art from non-experts, which emphasizes their different points of focus in their aesthetic engagement.

Later, Dr. Pihko and her Aalto University research team conducted a study using 20 art history students, remaining consistent with the sample group Augustin et al’s study used, and 20 non-art majors (7). Self-reported evaluations, eye movements, and electrodermal activities were recorded as they examined 35 paintings, ranging from representational to abstract. Each painting was presented in a 10 second initial time frame and a 30 second secondary time frame. By testing for both the physical condition and the expressed evaluations of their participants, Pihko et al. were able to demonstrate biological evidence for the differing aesthetic engagements of art experts and non-experts. Art experts were found to focus their eyes more on characteristics away from the center of the paintings, similarly to Nodine et al’s findings. Additionally, they were found to express more consistent electrodermal activity between the different time frames, suggesting that they engaged with art at a more steady pace. As for their evaluations, the experts were found to prefer paintings independently of their abstraction level. This is likely because Augustin et al. found that they were more likely to consider intentions, indicating that intentions may play a stronger role than style in expert preferences.

Following this study, psychology professor Dr. Silvia focused on differences in interest between art experts and non-experts (8). Unlike Augustin et al. and Pihko et al., Silvia classified the expertise of his 174 participants using an aesthetic fluency scale and only selected psychology students. He had participants complete a 7-item questionnaire on their interest in 11 black and white art pieces, all ranging in abstraction. The participants who scored well on the art fluency scale were also found to show higher levels of interest in abstract art based on the questionnaire. This may explain Pihko et al.'s findings about consistent electrodermal activity of art experts: a higher level of interest may correspond to a more steady thought process upon aesthetic engagement. When considering these studies all together, it is clear that art experts engage with artworks with a deeper understanding of their formal qualities, stylistic features, and artistic intentions consistently across varying levels of abstraction.

1.3 Non-expert interpretation of abstract art

These studies also found that, unlike the aesthetic engagements of art experts, non-expert aesthetic engagement shifted noticeably with changes in abstraction level. The non-expert group in Augustin et al.'s study was more likely to categorize art into subjective rather than objective categories as its level of abstraction increased. They were observed to use general dimensions, such as positive vs negative and pleasant vs unpleasant. Pihko et al. found that non-experts strongly preferred representational art, and interestingly, they fixated on human faces on the artworks for 12% longer than experts did. Moreover, the electrodermal activity increased significantly during the

second time frame, indicating that their processing may be more delayed than that of experts. The increasing electrodermal behavior of non-experts aligns with Augustin et al.'s findings since subjective aesthetic engagements may imply prolonged emotional processing.

The non-experts in Silvia et al.'s study were more likely to be uninterested in interpreting art pieces as they became more abstract. This likely explains why non-experts in Augustin et al.'s study relied on subjective categories. Potentially lacking the interest to objectively engage with the meaning behind abstract artworks, their primary responses were guided by their initial emotions. Overall, these studies generally indicate that non-experts' limited ability to objectively understand abstract art leads them to engage with it more subjectively and to prefer representational art, where they focus on more prominent elements such as human faces.

1.4 Literature review summary

It is crucial to consider how the methodologies of these studies possess limitations that must be considered when applying their findings. Most notably, these studies are inconsistent in how they define "expertise," with Pihko et al and Augustin et al. using art history students, and Silvia using psychology students who were deemed art experts using a questionnaire. Expertise can encompass practical studio experience, historical knowledge, or even prolonged exposure to art, so reducing it to academic enrollment or a score from a questionnaire may oversimplify the term. Additionally, the samples from each study were drawn from single universities, which raises concerns about how generalizable their findings

are. Cultural background, in particular, may significantly influence art aesthetic engagement, but that was not accounted for in those studies.

Even with restrictions, these studies still collectively suggest consistent differences between expert and non-expert aesthetic engagement. Despite this, no studies have explored the varying aesthetic engagements of pieces based on the different abstract art styles of Impressionism, Expressionism, Cubism, and Surrealism, as this study does. Similarly to the discussed studies, this study will also use participants from a single university, particularly George Mason University. This means that it is assumed that the expertise of art students at George Mason University aligns with the expertise of art students at other universities.

The artworks that the participants engaged with were author-created to avoid any prejudices at recognized art, sharing the same subject and contents. Thus, this study remains merely a pilot study, as the findings can only apply to the aesthetic engagement with the pieces created. However, the preliminary evidence it presented still warrants further investigations to explore further implications onto the broader art styles. Based on previous evidence suggesting that non-experts tend to focus more strongly on facial expressions and immediate emotional content, it was hypothesized that the Expressionist painting would produce the greatest divergence in aesthetic engagement between art majors and non-art majors. Because Expressionism is characterized by heightened emotional expression and dramatic facial features, it was expected to amplify differences

in how the two groups attended to and interpreted the artwork.

2. Materials and Methods

2.1 Design

By determining how experts engage with art pieces in the styles of Impressionism, Expressionism, Surrealism, and Cubism differently from non-experts, the art community can be provided with insights on how expertise may impact aesthetic engagement with four art pieces based on their style, not just their general level of abstraction. Considering how past studies have used art majors and non-art majors as models of individuals with or without expertise, surveying George Mason University students was an adequate method of acquiring data that could be consistently evaluated alongside past results. Unlike previous studies that defined expertise using art history students exclusively, this pilot study included students from multiple art-related majors to account for the limited number of art history majors at George Mason University. As a result, expertise was conceptualized more broadly as formal training and experience in the visual arts rather than as art historical knowledge alone. Although this approach remained partially aligned with those studies through the inclusion of art history majors, it also introduced a broader range of expertise levels among participants. As a result, expertise in this pilot study was treated as a spectrum of artistic training and experience rather than as a narrowly defined set of skills or disciplinary knowledge. Nevertheless, this definition remained appropriate for the purposes of this pilot study because it captured meaningful differences in artistic training,

experience, and familiarity with visual art. Furthermore, the use of author-created artworks reduced the potential influence of prior familiarity with well-known pieces, allowing participants' responses to be driven more directly by the stylistic characteristics of the paintings themselves. This approach facilitated a more focused examination of how viewers interpreted Impressionist, Expressionist, Cubist, and Surrealist renderings of the same subject and provided preliminary insights that may inform future investigations of aesthetic engagement within the broader art community.

2.2 Methods

Representative artworks associated with the styles of Impressionism, Expressionism, Surrealism, and Cubism were systematically examined, with examples provided in Appendix 1. To ensure historical authenticity and accurate stylistic representation, these reference works were obtained from official museum collections and websites, including Musée Marmottan Monet. Following this review, a common subject was selected for all paintings. Subject matter was held constant across the Impressionist, Expressionist, Surrealist, and Cubist renditions to minimize potential confounding effects arising from differences in content and to allow aesthetic engagement to be evaluated primarily as a function of artistic style.

The selected subject was that of a woman in a pink dress holding a flower. This subject was chosen because human figures appeared

frequently across the Impressionist, Expressionist, Surrealist, and Cubist reference works examined (appendix 1), and formal attire was a recurring visual element within many of those paintings. Four acrylic paintings depicting the same subject were then created, each rendered in the style of Impressionism, Expressionism, Surrealism, or Cubism, respectively (Figure 1). To assess stylistic fidelity, the completed artworks were reviewed and approved by an Advanced Placement art teacher for their alignment with their intended artistic styles. Although stylistic validity was not independently evaluated by multiple art professionals, the use of a controlled subject across all four paintings strengthened the study design by helping isolate stylistic variation as the primary factor influencing aesthetic engagement.

Participants were recruited from the George Mason University campus, including both the art building and general campus areas. Individuals who expressed interest in participating were provided with information about the study and an informed consent form (appendix 3) describing its purpose, the voluntary nature of participation, and the anonymous handling of responses. Participants indicated their consent before proceeding to the survey and no personally identifying information was collected. Those who consented were then provided with a QR code linking to the survey, which asked participants to evaluate the four artworks.



Figure 1. Impressionist (top left), Expressionist (top right), Cubist (bottom left), and Surrealist (bottom right), author-created art pieces.

The survey included seven items adapted from the Aesthetic Experience Questionnaire, an instrument designed to assess aesthetic engagement (9). Participants rated their agreement with statements such as “I focus on the subtle aspects of the work of art” using a seven-point Likert scale. The complete list of survey items is provided in appendix 2. This questionnaire was selected because it has been

used in previous research to assess aesthetic engagement, particularly dimensions related to emotional response, attentional focus, immersion, perceived reward, and efforts to understand artworks.

Although the instrument has not been specifically applied to studies comparing aesthetic engagement across levels of artistic

expertise, Świątek et al. demonstrated its validity in a sample of approximately 800 participants engaging with a variety of artistic media, including visual art and music. Scores obtained from the questionnaire were positively associated with cognitive processing, aesthetic competence, and emotional regulation, supporting its suitability as a measure of aesthetic engagement. In addition to the quantitative survey items, participants were given the opportunity to provide written commentary, which was later examined through an informal qualitative analysis.

The study protocol was reviewed and approved by the appropriate Institutional Review Board. The study was determined to involve minimal risk to participants and was conducted in accordance with applicable ethical guidelines for research involving human participants.

Participants were classified as either art majors or non-art majors to serve as a proxy for differing levels of artistic training and expertise. This classification enabled comparisons of aesthetic engagement between individuals with formal academic exposure to the visual arts and those without such training. Beyond academic major, the sample consisted primarily of young adult university students and included participants from diverse gender and racial backgrounds. The study cohort ultimately consisted of 8 participants who were art majors and 36 participants who were non-art majors.

2.3 Data analysis

In this pilot study, artistic style and participant expertise served as the primary independent variables, while participants' survey responses

and written commentary served as the dependent variables. Questionnaire items were grouped according to the dimensions of aesthetic engagement they represented, including emotion, reward, immersion, focus, and understanding (appendix 2). Mann–Whitney U tests were conducted to compare quantitative responses between art majors and non-art majors for each dimension across the four paintings. Because the sample size was small and responses were measured on an ordinal Likert scale, a nonparametric approach was used. Rank-biserial correlations were calculated to assess the magnitude of observed differences. 95% non-parametric confidence intervals found with the non-parametric binomial method were also calculated to indicate the reliability of the effect sizes.

For each of the four paintings, dimensions yielding p-values below the predetermined significance threshold of 0.10 were considered to demonstrate statistically different levels of aesthetic engagement between art majors and non-art majors. The threshold was set at 0.10 rather than the conventional 0.05 to account for the exploratory nature of the study and the limited sample size. While this choice increased the likelihood of Type I error (false positives), it also reduced the risk of Type II error (failing to detect potentially meaningful differences). Consequently, statistically significant findings should be interpreted as preliminary and exploratory rather than definitive evidence of group differences.

Written comments were examined qualitatively to identify recurring themes and patterns in participants' interpretations of the artworks.

Median scores for each dimension of aesthetic engagement were plotted for the four paintings and presented alongside representative participant commentary to provide additional context for the quantitative findings. Medians were reported rather than means because they are less sensitive to outliers and are generally more appropriate for small samples and ordinal Likert-scale data. In addition, a summary table was generated reporting the mean absolute effect size across dimensions, the dimension exhibiting the largest expertise-related difference, and the corresponding effect size for each painting.

Although the five dimensions collectively represent components of aesthetic engagement, each captures a distinct component of the aesthetic experience. Emotion reflects the affective impact of an artwork and the extent to which it evokes feelings. Reward refers to the degree of enjoyment or appreciation derived from the viewing experience, therefore representing an evaluative rather than an emotional response. Immersion describes the extent to which viewers become absorbed in the artwork and mentally engaged with the experience itself. Focus captures attentional engagement toward visual details and general elements. Understanding reflects the viewer's

perceived ability to interpret, comprehend, or derive meaning from the artwork.

Although these dimensions may interact during aesthetic experiences, they are conceptually distinct. For example, a viewer may focus intently on a painting without fully understanding it, experience strong emotions without finding the artwork rewarding, or derive considerable enjoyment from a painting despite limited immersion. Examining these dimensions separately therefore allows for a more nuanced assessment of how artistic expertise may influence different components of aesthetic engagement.

3. Results

Table 1 presents the Mann–Whitney U test p-values comparing art majors and non-art majors across the five dimensions of aesthetic engagement for each painting. Using the predetermined significance threshold of 0.10, statistically significant differences were observed in two of the five dimensions for the Impressionist, Expressionist and Surrealist paintings, and three dimensions for the Cubist painting. The Cubist painting therefore exhibited the greatest number of dimensions showing expertise-related differences, whereas the remaining paintings displayed more limited patterns of divergence.

Table 1. Mann–Whitney U test results for five dimensions of aesthetic engagement across Impressionist, Expressionist, Cubist, and Surrealist paintings

Art Piece	Emotion	Reward	Immersion	Focus	Understanding
Impressionist	0.06	0.77	0.84	0.03	0.34
Expressionist	0.27	0.13	0.10	<0.01	0.34
Cubist	<0.01	0.10	0.47	<0.01	0.13
Surrealist	0.02	0.41	0.65	0.24	0.9

Examining individual dimensions revealed several notable trends. Focus and emotion emerged as the most consistently differentiating dimensions across paintings. Focus was statistically different between groups for the Impressionist, Expressionist, and Cubist paintings, while emotion was statistically different for the Impressionist, Cubist, and Surrealist paintings. In contrast, understanding did not reach statistical significance for any painting, and immersion showed little evidence of group differences, approaching significance only for the Expressionist painting ($p = 0.10$). These findings suggest that expertise-related differences may be more strongly associated with attentional and emotional aspects of aesthetic engagement than with immersion or perceived understanding.

The strongest statistical differences observed in the study were associated with the Cubist painting. Both emotion and focus yielded p -values below 0.01, indicating particularly pronounced divergence between art majors and non-art majors for these dimensions. Interestingly, although the original hypothesis predicted that the Expressionist painting would generate the greatest differences between groups because of its emphasis on emotional expression, emotion was not statistically different for the Expressionist painting ($p = 0.27$). Instead, the Expressionist painting primarily differentiated groups through focus ($p < 0.01$). Similarly, the Surrealist painting exhibited significant differences in emotion ($p = 0.02$) but not in focus, suggesting that different artistic styles may influence different dimensions of aesthetic engagement.

Overall, the pattern of p -values indicates that expertise-related differences were not uniformly distributed across either artistic styles or dimensions of engagement. Rather, certain dimensions—particularly emotion and focus—appeared more sensitive to differences in artistic expertise, while the Cubist painting consistently produced the strongest evidence of divergence between art majors and non-art majors.

To evaluate the magnitude of group differences, rank-biserial correlations (r_{rb}) were calculated for each Mann-Whitney U comparison. Rank-biserial correlations were derived from the Mann-Whitney U statistic using the formula $r_{rb} = 1 - \frac{2U}{n_1 n_2}$, where U represents the Mann-Whitney U statistic, n_1 is the number of art majors, and n_2 is the number of non-art majors. Interpretation focused primarily on the relative absolute magnitude of the observed effect size. In general, larger absolute values indicate greater separation between the responses of art majors and non-art majors, whereas values closer to zero indicate greater similarity between groups. To assess the precision of effect size estimates, 95% confidence intervals were generated using a nonparametric bootstrap procedure with 10,000 resamples in R (R Foundation for Statistical Computing, Vienna, Austria). For each bootstrap sample, the rank-biserial correlation was recalculated, producing an empirical sampling distribution of effect sizes. Confidence intervals were then obtained using the percentile method, with the 2.5th and 97.5th percentiles of the bootstrap distribution serving as the lower and upper confidence bounds, respectively. Table 2 shows the results from these calculations.

Table 2. Rank-Biserial correlations and 95% confidence intervals comparing aesthetic engagement between art majors and non-art majors across four artistic styles

Dimension	Impressionist r_{rb} [95% CI]	Expressionist r_{rb} [95% CI]	Cubist r_{rb} [95% CI]	Surrealist r_{rb} [95% CI]
Emotion	0.289 [0.029, 0.560]	0.195 [-0.065, 0.460]	0.439 [0.201, 0.663]	0.375 [0.123, 0.608]
Reward	-0.024 [-0.472, 0.425]	0.397 [0.091, 0.690]	0.361 [0.000, 0.711]	0.168 [-0.179, 0.500]
Immersion	-0.050 [-0.464, 0.375]	0.375 [-0.036, 0.736]	0.168 [-0.229, 0.543]	0.171 [-0.270, 0.587]
Focus	0.346 [0.088, 0.587]	0.454 [0.195, 0.686]	0.411 [0.135, 0.652]	0.211 [-0.055, 0.476]
Understanding	0.232 [-0.111, 0.554]	0.250 [-0.107, 0.582]	0.371 [0.029, 0.675]	0.011 [-0.393, 0.404]

Table 2 indicates that expertise-related differences were not distributed evenly across either artistic styles or dimensions of aesthetic engagement. The largest effects were observed for focus in the Expressionist painting ($r_{rb} = 0.454$), emotion in the Cubist painting ($r_{rb} = 0.439$), and focus in the Cubist painting ($r_{rb} = 0.411$), suggesting that attentional and emotional engagement were among the dimensions most strongly associated with artistic expertise. Additional moderate-to-large effects were observed for reward and immersion in the Expressionist painting, emotion in the Surrealist painting, and reward and understanding in the Cubist painting. Together, these findings suggest that expertise-related differences extended beyond a single dimension and were particularly pronounced for certain artistic styles.

When examined by painting, the Cubist work exhibited consistently elevated effect sizes across multiple dimensions, including emotion, reward, focus, and understanding. Unlike the other paintings, which tended to show one or two prominent dimensions, the Cubist painting produced moderate-to-large effects across nearly all dimensions except immersion. This

pattern suggests that the Cubist work generated the broadest divergence between art majors and non-art majors and that expertise-related differences were not confined to a single aspect of aesthetic engagement.

The Expressionist painting exhibited a different profile. Its strongest effects were observed for focus, reward, and immersion, while emotion and understanding produced comparatively smaller differences. This finding is noteworthy because the original hypothesis anticipated that emotional expression would drive the greatest divergence between groups. Instead, the data suggest that artistic expertise may have influenced how participants attended to and engaged with the Expressionist work more strongly than their emotional reactions to it.

Across dimensions, focus emerged as the most consistently differentiating aspect of aesthetic engagement, exhibiting moderate-to-large effects for three of the four paintings. Emotion also showed substantial expertise-related differences, particularly for the Cubist and Surrealist works. In contrast, understanding generally produced smaller effects except for the Cubist painting, while immersion exhibited

relatively modest differences outside of the Expressionist work. These patterns suggest that artistic expertise may influence attentional and emotional engagement more consistently than immersion or perceived understanding when viewing the artworks examined in this study.

The confidence intervals further indicate that the strongest effects tended to be associated with intervals that were entirely positive, particularly for the Cubist and Expressionist paintings. In contrast, several smaller effects possessed intervals spanning zero, suggesting greater uncertainty regarding the magnitude and direction of those differences. Consequently, the most robust evidence for expertise-related divergence was concentrated in the focus and emotion dimensions of the Expressionist and Cubist paintings.

Figure 2 displays the median responses of art majors and non-art majors across the five

dimensions of aesthetic engagement for the Impressionist painting. Art majors reported higher median scores than non-art majors for emotion, focus, and understanding, while both groups reported identical median scores for reward and immersion. The largest differences were observed for focus and understanding, with art majors reporting median scores of 5.5 compared with 4.0 among non-art majors. A smaller difference was observed for emotion, where art majors reported a median score of 3.0 and non-art majors reported a median score of 2.0. Overall, the Impressionist painting exhibited higher median ratings among art majors for three of the five dimensions examined, whereas reward and immersion yielded comparable responses between groups. These median patterns are consistent with the statistical analyses presented in Tables 1 and 2, where focus and emotion exhibited some of the largest expertise-related differences for the Impressionist painting.

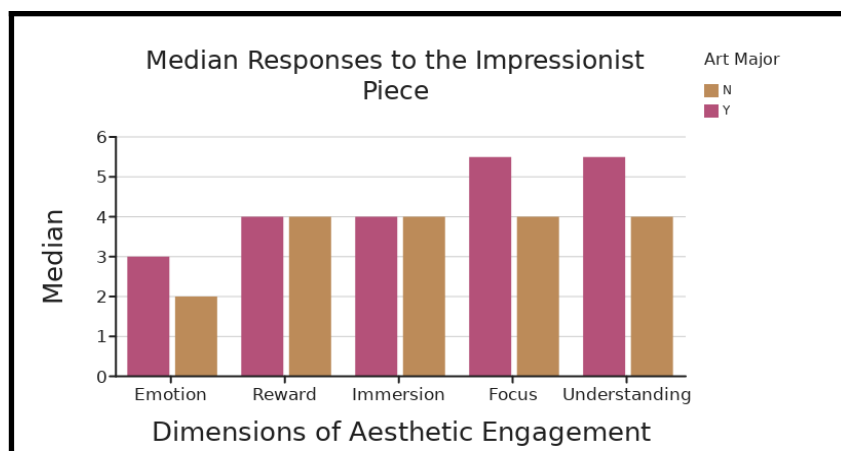


Figure 2. Median responses to the Impressionist piece based on dimensions of aesthetic engagement. N: non-art majors, and Y: art majors.

Table 3. Excerpts on the commentary on the Impressionist piece

Art Major	Non-Art Major
“very nice and satisfying texture, the lines/folds on the dress specifically is my favorite”	“I enjoy the style of the brush strokes and how everything is smooth, but at the same time wild”
“I honestly feel that the way the colors are used in this work makes it stand out.”	“Haven't seen the other art pieces yet. All I can say is that this piece lacks detail and looks sloppy (if that makes sense).”

Figure 3 presents the median responses of art majors and non-art majors across the five dimensions of aesthetic engagement for the Expressionist painting. Art majors reported higher median scores than non-art majors for all five dimensions. The largest differences were observed for focus and immersion, where art majors reported median scores of 6.0 and 4.5, respectively, compared with median scores of 4.0 and 3.0 among non-art majors. Smaller differences were observed for emotion, reward, and understanding, with art majors consistently reporting higher ratings. Overall, the Expressionist painting exhibited elevated median responses among art majors across every dimension of aesthetic engagement, with the greatest divergence occurring in focus and immersion. These median patterns are consistent with the effect-size analysis presented in Table 2, where focus, reward, and immersion exhibited some of the largest expertise-related differences for the Expressionist painting.

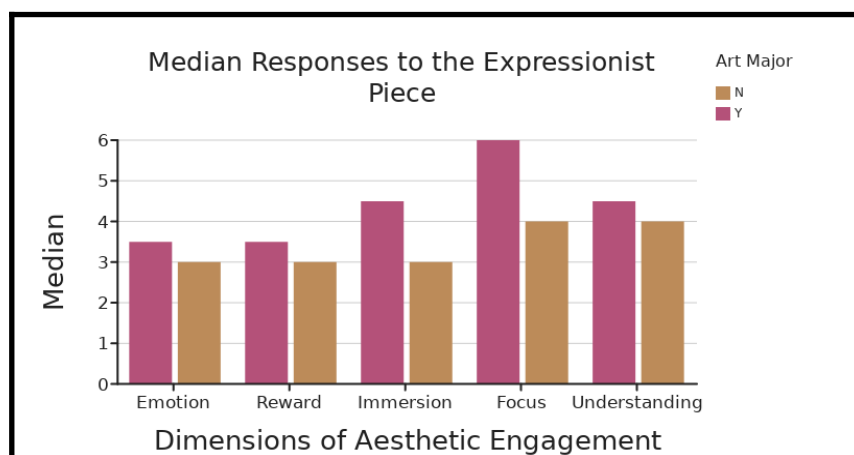
**Figure 3.** Median responses to the Expressionist piece based on dimensions of aesthetic engagement. N: non-art majors, Y: art majors.

Table 4. Excerpts from the commentary on the Expressionist piece

Art Major	Non-Art Major
“The overlaying colors really give the work a whole new feeling to it.”	“It is harder for me to focus on finding the message, but the colors feel like they have more significance and meaning in this piece.”
“The subject in the front (in the dress) combined with the strangely familiar yet rather unknown background creates wonder in me - it makes me think.”	“I don’t like how dark this is”

Figure 4 presents the median responses of art majors and non-art majors across the five dimensions of aesthetic engagement for the Cubist painting. Art majors reported higher median scores than non-art majors for all five dimensions. The largest differences were observed for reward and understanding, where art majors reported median scores of 4.0 and 5.0 compared with median scores of 2.0 and 3.0 among non-art majors. Substantial differences were also observed for emotion and focus, while immersion exhibited the smallest difference between groups. Overall, the Cubist painting demonstrated consistently higher levels of reported engagement among art majors across all dimensions and exhibited the broadest pattern of divergence between art majors and non-art majors among the paintings examined. These median patterns are consistent with the statistical analyses presented in Tables 1 and 2, where the Cubist painting exhibited the greatest number of statistically different dimensions and some of the largest expertise-related effect sizes observed in the study.

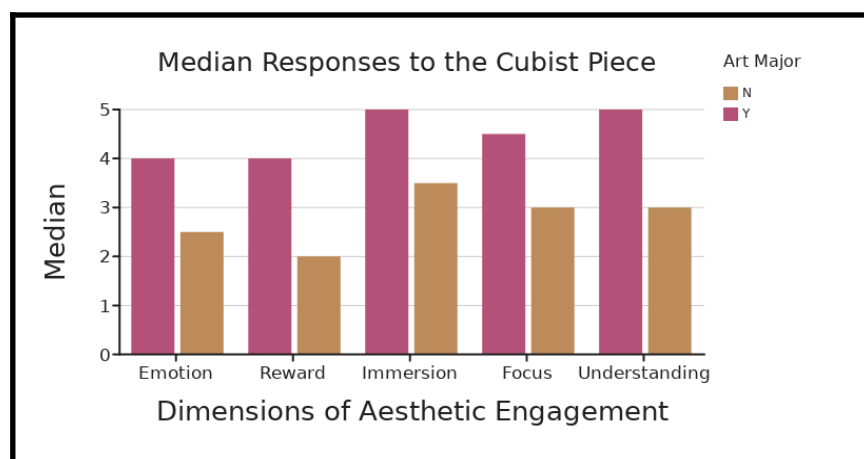
**Figure 4.** Median responses to the Cubist piece based on dimensions of aesthetic engagement. N: non-art majors, Y: art majors.

Table 5. Excerpts from the commentary on the Cubist piece

Art Major	Non-Art Major
“Very nice shapes, this one has a feeling of confusion or maybe distortion & abstraction” “The use of geometrical shapes makes it stand out more from the previous ones.”	“Do I even need to say anything? It looks so terrible what the h---.” “I find almost no meaning in cubism. This is just a personal preference but it has too many aesthetic engagements to be limited to one, which makes it feel less significant.”

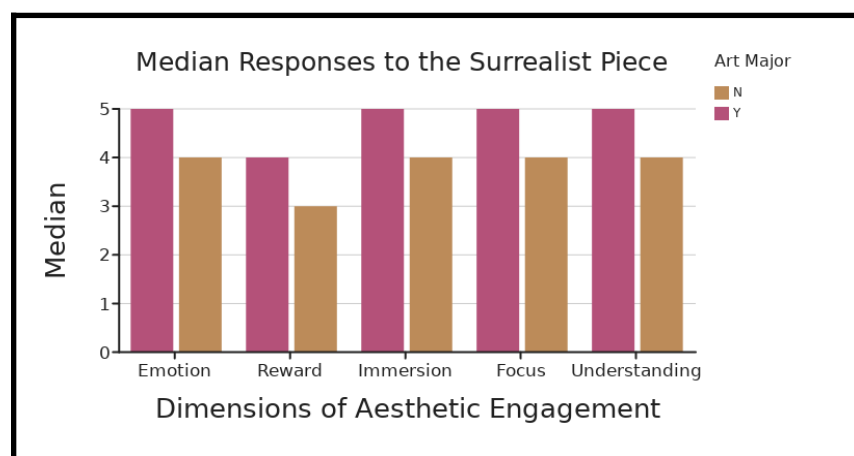
**Figure 5.** Median responses to the Surrealist piece based on dimensions of aesthetic engagement. N: non-art majors, Y: art majors.

Figure 5 presents the median responses of art majors and non-art majors across the five dimensions of aesthetic engagement for the Surrealist painting. Art majors reported higher median scores than non-art majors for all five dimensions. The largest difference was observed for emotion, where art majors reported a median score of 5.0 compared with 4.0 among non-art majors. Smaller but consistent differences were observed for reward, immersion, focus, and understanding, with art majors reporting median scores that were

approximately one point higher than those of non-art majors across each dimension. Overall, the Surrealist painting exhibited a relatively uniform pattern of elevated engagement among art majors across all dimensions. These median patterns are consistent with the statistical analyses presented in Tables 1 and 2, which identified emotion as the dimension exhibiting the strongest expertise-related difference for the Surrealist painting, while the remaining dimensions showed comparatively smaller effects.

Table 6. Excerpts from the commentary on the Surrealist piece

Art Major	Non-Art Major
“Women are flowers”	“This one mostly leaves me confused and a bit unsettled.”
“The detail of replacing the heads with flowers, and the flowers with heads really makes you rethink its meaning.”	“Creepy to me. I don't like how the face is replaced by the flower and how there is a flying face. That is putting me off.”

Table 7. Summary of Mean Expertise-Related Effect Sizes Across Aesthetic Engagement Dimensions

Painting	Mean r_{rp} Across Dimensions	Largest Effect Dimension	Largest Effect Size
Impressionist	0.188	Focus	0.346
Expressionist	0.334	Focus	0.454
Cubist	0.350	Emotion	0.439
Surrealist	0.187	Emotion	0.375

Table 7 summarizes the overall magnitude of expertise-related differences across the five dimensions of aesthetic engagement for each painting. Values represent the |absolute| mean rank-biserial correlation (r_{rp}) across emotion, reward, immersion, focus, and understanding. Larger values indicate greater divergence between art majors and non-art majors. The Cubist painting exhibited the largest average effect size across dimensions (mean r_{rp} = 0.350), followed closely by the Expressionist painting (mean r_{rp} = 0.334). In contrast, the Impressionist (mean r_{rp} = 0.188) and Surrealist (mean r_{rp} = 0.187) paintings yielded substantially smaller average effect sizes. Thus, the average expertise-related divergence observed for the Cubist and Expressionist paintings was nearly twice that observed for the Impressionist and Surrealist paintings.

The dimensions exhibiting the largest expertise-related differences also varied across paintings. For both the Impressionist and Expressionist

paintings, focus represented the strongest differentiating dimension, with effect sizes of 0.346 and 0.454, respectively. In contrast, emotion represented the strongest differentiating dimension for both the Cubist and Surrealist paintings, with effect sizes of 0.439 and 0.375, respectively. This pattern indicates that the dimensions most strongly associated with expertise differed across artistic styles rather than remaining constant across all four paintings.

The Expressionist and Cubist paintings exhibited comparable overall profiles of expertise-related divergence, as reflected by their similar mean effect sizes (0.334 and 0.350, respectively). However, the dimensions contributing most strongly to these differences differed between the two paintings. The Expressionist painting was characterized by its largest effect in focus, whereas the Cubist painting was characterized by its largest effect in emotion. This suggests that paintings with

similar overall levels of expertise-related divergence may nevertheless differ in the specific dimensions in which those differences are most pronounced.

Comparison of the largest observed effect within each painting further highlights differences among styles. The largest effect observed in the entire study occurred for focus in the Expressionist painting ($r_{\text{fb}} = 0.454$), followed closely by emotion in the Cubist painting ($r_{\text{fb}} = 0.439$). The corresponding maximum effects for the Impressionist and Surrealist paintings were smaller, at 0.346 and 0.375, respectively. Together, these results indicate that expertise-related differences were concentrated most strongly in the Expressionist and Cubist paintings, while the Impressionist and Surrealist paintings produced comparatively weaker overall divergence between art majors and non-art majors.

Collectively, these findings indicate that expertise-related differences varied across both artistic styles and dimensions of engagement, with the Cubist and Expressionist paintings exhibiting the strongest overall divergence between groups.

4. Discussion

This exploratory pilot study investigated whether art majors and non-art majors aesthetically engage differently with four author-created paintings depicting the same subject matter but recreated in the styles of Impressionism, Expressionism, Cubism, and Surrealism. The findings suggest not only that art majors engage with abstract art differently from non-art majors, as supported by previous

research, but that these differences vary across both artistic styles and dimensions of aesthetic engagement. Importantly, whereas previous studies have primarily examined overall differences between experts and non-experts, the present study compared expertise-related differences across multiple artistic styles while controlling for subject matter and simultaneously examining emotion, reward, immersion, focus, and understanding as distinct dimensions of aesthetic engagement. While the findings solely apply to the four works, they still provide preliminary evidence that stylistic manipulation alone may influence how viewers aesthetically engage with an artwork.

Furthermore, the hypothesis that the Expressionist painting would produce the greatest divergence between art majors and non-art majors was not supported. Instead, Table 2 indicates that the largest overall differences between groups were observed for the Cubist painting, which exhibited comparatively strong effect sizes across multiple dimensions, including emotion, focus, reward, and understanding. In contrast, the Surrealist painting produced more limited expertise-related differences despite eliciting substantial emotional engagement. It is important to note how across all aesthetic dimensions, except for immersion and reward in the Impressionist piece, the effect sizes were positive, suggesting that art majors generally reported stronger aesthetic engagement when it comes to emotion, reward, immersion, focus, and understanding. This also suggests that the findings of Silvia's study, that art experts have a higher level of interest in abstract art than non-art experts, may apply to every piece explored in this pilot study

(8). To further quantify which dimensions of aesthetic engagement were most strongly associated with expertise, mean rank-biserial correlations were calculated across the four paintings for each dimension. When averaged across the four paintings, Focus exhibited the largest average expertise-related effect, followed closely by emotion. Reward and understanding showed intermediate average differences, whereas immersion produced the smallest average effect. These findings suggest that artistic expertise may influence attentional and emotional engagement more strongly than immersive engagement when viewing the paintings examined in this study. Thus, the magnitude of the focus effect was ~ 2.1 times larger than the immersion effect, suggesting that artistic training may influence attentional engagement more strongly than immersive engagement when viewing the four paintings examined in this study. This also suggests that artistic training may influence how viewers attend to and emotionally process the presented artworks more strongly than it influences their attempts to understand them. Overall, while art majors generally reported higher engagement across most dimensions, the magnitude of these differences varied considerably depending on both the painting and the dimension being examined. This emphasizes how expertise may not simply increase aesthetic engagement overall, but alter specific aspects of the viewing experience.

When the paintings were examined as overall expertise-related engagement profiles, the Cubist painting produced the largest average absolute effect size across dimensions (mean $r_{rb} = 0.350$), followed by the Expressionist (mean

$r_{rb} = 0.334$), Impressionist (mean $r_{rb} = 0.188$), and Surrealist (mean $r_{rb} = 0.187$) paintings. This indicates that the Cubist work generated the broadest divergence between art majors and non-art majors across multiple dimensions of aesthetic engagement rather than in a single isolated domain. Qualitative responses help contextualize these findings. Table 5 indicates that art majors frequently commented on geometric structure, abstraction, and expressive qualities such as distortion, whereas non-art majors often expressed confusion or strong dislike. These results suggest that the interpretive ambiguity of the Cubist painting may have been interpreted differently by the two groups. Art majors may have viewed abstraction as an opportunity for interpretation and exploration, while non-art majors may have perceived the same ambiguity as a barrier to meaning. Lower focus, immersion, and reward ratings co-occurred among non-art majors viewing the Cubist painting. Because relationships among engagement dimensions were not directly analyzed, the present study cannot determine whether these dimensions influence one another. However, this interpretation remains speculative and should be investigated in future studies. Nevertheless, the convergence of effect-size results and qualitative commentary suggests that artistic training may increase tolerance for ambiguity in the presented painting and encourage viewers to derive reward from analytical engagement with its complex visual structures. The Surrealist painting produced a different pattern. Although Table 7 indicates that it generated a relatively high effect size for emotional engagements, the differences between the two demographics were generally smaller than those observed for the

Cubist painting. Table 6 indicates that both groups frequently reported feelings of confusion, curiosity, or unease, indicating that the unusual imagery may have evoked emotional responses regardless of artistic training. At the same time, art majors were more likely to discuss symbolism and possible interpretations, whereas non-art majors focused on their immediate emotional reactions, aligning with Augustin et al.'s findings on how non-art experts are more likely to make subjective remarks based on initial reactions (6). However, this difference in understanding of the symbolism does not align with how the survey items representing understanding were not statistically different for the Surrealist piece. This tension between the qualitative and quantitative data suggests that the average values may have hid important variation in aesthetic engagement. Overall, these findings still emphasize that some aspects of aesthetic engagement may be relatively robust to experience, while expertise primarily influences how viewers interpret those responses. The Impressionist and Expressionist paintings exhibited engagement profiles that differed from both the Cubist and Surrealist works. Figure 2 indicates that the Impressionist painting showed more evenly distributed expertise-related effect sizes across dimensions and comparatively modest expert-novel differences. Table 3 indicates that qualitative comments from both demographics references brushwork, color, and visual appearance, although evaluations varied. For instance, one of the non-art majors complimented the brush strokes and another said that they were "sloppy." This pattern suggests that the piece's stylistic features associated with Impressionism

may be accessible to both trained and untrained viewers, even when their judgments differ. In contrast, the Expressionist painting appeared to influence focus and immersion more strongly than understanding. Participants from both groups frequently discussed color usage, but art majors more often described reflective or interpretive experiences, whereas non-art majors focused on immediate preferences. This may indicate that stylistic manipulation can influence attentional engagement even when viewers differ in how they interpret the resulting experience. Additionally, it is important to note how Table 1 indicates that the reward dimension of engagement with the Expressionist piece was not statistically different, while Table 2 indicates that it possessed a moderate effect size. This discrepancy presents insight into how the small sample size was still able to somewhat capture the lack of statistical differences between this dimension of aesthetic engagement. Conversely, the immersion dimension for the Impressionist painting was also not statistically different, but it possessed a smaller effect size across all four pieces. This means that the immersion dimension of aesthetic engagement may be more sensitive to the smaller sample size for the presented paintings.

Examining the paintings as multidimensional patterns of engagement provides additional insight beyond individual statistical comparisons. Table 7 indicates that the Cubist painting exhibited the largest mean effect size characterized by large differences in emotion, focus, and reward, suggesting a viewing experience driven by interpretive effort and ambiguity. This emphasizes how the Cubist

painting exhibited the strongest overall expertise-related engagement profile, with moderate-to-large effect sizes for emotion ($r_{\text{FB}} = 0.439$), focus ($r_{\text{FB}} = 0.411$), understanding ($r_{\text{FB}} = 0.371$), and reward ($r_{\text{FB}} = 0.361$). Rather than reflecting a single dominant dimension, this pattern suggests that the Cubist painting elicited expertise-related differences across multiple aspects of aesthetic engagement simultaneously. The Surrealist painting, in contrast, produced a more emotionally oriented profile with comparatively smaller expertise-related differences. The Impressionist and Expressionist paintings yielded more evenly distributed effect sizes across dimensions. These differences suggest that aesthetic engagement can vary across multiple dimensions, with different paintings exhibiting different patterns of responses across emotion, reward, immersion, focus, and understanding. Thus, these paintings may engage viewers in qualitatively different ways, with some encouraging emotional responses, others encouraging analytical interpretation, and others producing a more balanced experience.

The qualitative commentary provides an independent line of evidence supporting this interpretation. Although a formal coding procedure was not able to be conducted due to the exploratory nature of this study, the qualitative responses consistently suggested differing emphases between groups. Art majors frequently referenced symbolism, artistic techniques, composition, abstraction, and stylistic characteristics, whereas non-art majors more often expressed personal preferences, immediate emotional reactions, confusion, or familiarity. These recurring patterns align with

previous research suggesting that artistic expertise promotes attention to formal and conceptual characteristics of artworks. The qualitative comments also revealed areas where the two groups converged. For example, participants from both groups responded emotionally to the Surrealist painting and commented on the color usage in the Expressionist painting. These areas of agreement suggest that some aspects of aesthetic engagement with the presented paintings may be independent of expertise, whereas other dimensions appear more strongly influenced by aesthetic training. Future studies could strengthen this observation by formally coding responses into thematic categories and statistically comparing theme frequencies between groups..

Taken together, the findings support a preliminary conceptual model in which artistic expertise influences aesthetic engagement through multiple pathways. Rather than simply increasing engagement overall, expertise may encourage greater attention to formal artistic elements, increase willingness to engage with ambiguity, and promote interpretive or symbolic thinking. This introduces the possibility that lower focus, immersion, and reward ratings co-occurred among non-art majors when viewing the Cubist painting. Because relationships among engagement dimensions were not directly analyzed, the present data cannot determine whether these dimensions influence one another. Future studies could examine these associations more directly. The present data cannot establish these mechanisms directly, so future studies should test them explicitly. However, the collective pattern of quantitative

results, qualitative commentary, and clustering analyses suggests that expertise may alter both how viewers process artworks and what they derive from that process.

Several limitations should be considered when interpreting these findings, particularly those affecting the reliability and generalizability of the results. Although the amount of non-art majors, 36, is comparable to the participant amount in Augustin et al's study, the amount of art majors, 8, is strikingly low (6). This takes away from the statistical power of the results and makes it harder to detect the true broader impact that expertise may have on aesthetic engagement. Additionally, using only one painting per style risks the impact that the subject may have had on aesthetic engagement, as many different subjects have been used across each art style. This potential impact may have been diminished if results from various paintings with different subjects were pooled together into their respective style, allowing for more holistic conclusions to be made. Since the paintings could not represent the general movements of Impressionism, Expressionism, Cubism, and Surrealism, any broader implications regarding artistic styles should therefore be considered tentative hypotheses requiring validation using multiple representative artworks. Although every art major in this pilot study is majoring in an art related field, the specific art major that they were in was not accounted for in the results, such as studio art and art history majors. Individuals from different art majors may have had different types of training leading to different interpretive approaches. An additional limitation is that several potentially informative

secondary analyses could not be conducted within the scope of this pilot study. For example, direct analyses of convergence and divergence between groups, correlations among aesthetic engagement dimensions, and formal thematic coding of qualitative responses would require larger samples or more extensive qualitative datasets. Future research could incorporate these approaches to further quantify the mechanisms through which expertise influences aesthetic engagement. These limitations suggest that the findings should be interpreted as exploratory and restricted to the four paintings that were explored, highlighting the need for more controlled and large-scale studies on this topic.

Despite these limitations, this pilot study demonstrates that meaningful differences in aesthetic engagement can emerge even when subject matter is held constant and only stylistic characteristics are varied, expanding on how previous studies indicate that art majors generally aesthetically engage more with abstract art. The findings suggest that artistic training may influence not only the magnitude of engagement but also the structure, shaping how viewers allocate attention, interpret ambiguity, and derive meaning from the presented paintings.

5. Conclusion

This exploratory pilot study examined whether art majors and non-art majors differ in their aesthetic engagement with four paintings depicting the same subject matter but recreated in the styles of Impressionism, Expressionism, Cubism, and Surrealism. Consistent with previous research, art majors generally reported stronger aesthetic engagement than non-art

majors across multiple dimensions. However, the findings suggest that expertise-related differences were not uniform across either artistic styles or dimensions of engagement. The Cubist painting produced the largest overall divergence between groups, whereas the Impressionist and Surrealist paintings exhibited comparatively smaller expertise-related effects. Across the five dimensions examined, focus and emotion demonstrated the strongest average associations with artistic expertise, while immersion exhibited the weakest. Importantly, whereas previous studies have primarily focused on overall differences between experts and non-experts, the present study examined how expertise-related differences vary across multiple artistic styles and across distinct dimensions of aesthetic engagement while controlling for subject matter. To the author's knowledge, comparisons of Impressionist, Expressionist, Cubist, and Surrealist recreations of the same subject across the dimensions of emotion, reward, immersion, focus, and understanding have not been previously reported in the literature.

The findings further suggest that artistic expertise may influence more than the overall magnitude of engagement. Qualitative responses indicated that art majors more frequently discussed symbolism, artistic techniques, compositional structure, and interpretive possibilities, whereas non-art majors more often emphasized personal preferences and immediate reactions. In several instances, qualitative interpretations provided insights not fully captured by the quantitative measures, highlighting the value of combining multiple approaches when investigating

aesthetic engagement. Together, these results suggest that artistic training may shape how viewers attend to, interpret, and emotionally engage with artworks, although the specific nature and mechanisms of these influences require further investigation.

Several limitations should be considered when interpreting these findings. The sample size was small, only one author-created painting represented each artistic style, and the study was conducted at a single institution. Consequently, the results should be regarded as exploratory and restricted to the specific artworks examined rather than as representative of Impressionism, Expressionism, Cubism, or Surrealism more broadly. Future research should incorporate larger and more diverse samples, multiple representative works from each artistic movement, and direct analyses of relationships among engagement dimensions. Such studies would help determine whether the patterns observed reflect broader characteristics of artistic expertise and aesthetic engagement or are specific to the paintings investigated in this pilot study.

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Appendix 1. Representative reference artworks used to characterize Impressionist, Expressionist, Cubist, and Surrealist styles



Figure A1. Impressionist: 'Woman with a Parasol - Madame Monet and Her Son', Claude Monet, 1875, oil on canvas, located at the National Gallery of Art in Washington, D.C., USA



Figure A2. Expressionist: 'Self-portrait', Marianne von Werefkin's, 1910, painting, tempera on paper, located at the Städtische Galerie im Lenbachhaus in Munich, Germany.



Figure A3. Cubist: 'Woman In An Armchair', Pablo Picasso, 1941, oil on canvas, located at the Museum of Modern Art (MoMA) in New York City.



Figure A4. Surrealist: ‘The Son of Man’, René Magritte, 1964, oil on canvas, located in a private collection.

Appendix 2. Survey items with associated aesthetic dimensions

1. I experience a wide range of emotions. [Emotion]
2. I feel moved. [Emotion]
3. The experience of viewing the work of art is rewarding to me. [Reward]
4. The colors of the work of art are important to me. [Immersion]
5. I focus on the subtle aspects of the work of art. [Focus]
6. I try to understand what the artist is trying to communicate. [Understanding]
7. I am completely focused on viewing the work of art. [Focus]

Appendix 3. Informed consent form

RESEARCH PROCEDURES

This research is being conducted to determine whether art-experts interpret art styles differently from non-art experts. If you agree to participate, you will be asked to fill out a survey that measures your interpretations of different art pieces as well as a written response on how you feel about the pieces relative to each other.

RISKS

There are no risks or discomforts that apply to this survey.

BENEFITS

There are no benefits to you as a participant other than to further research in art and psychology.

CONFIDENTIALITY

The data in this study will be confidential.

When answering the survey, the individual participant will answer all the questions anonymously. When collecting data no survey entry will have details on who the individual who answered it may be. The data collection will only be received by the host of the research, and their mentor. They will be the only individuals who have access to the survey and results.

PARTICIPATION

Your participation is voluntary, and you may withdraw from the study at any time and for any reason. If you decide not to participate or if you withdraw from the study, there is no penalty or loss of benefits to which you are otherwise entitled. There are no costs to you or any other party. You have the opportunity to leave and submit after every question. If at any point you would like to pull your responses from use, please contact laila.i.mogassbi@gmail.com.

CONTACT

This research is being conducted by Laila Mogassbi at John Champe High School. Their school may be reached at jchattendance@lcps.org for questions or to report a research-related problem.

This research has been reviewed according to Loudoun County Public Schools procedures governing your or your student's participation in this research.