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# Resonant Perceptions: Exploring Autistic Aesthetics through Embodied Cognition

James Hutson and Piper Hutson

The ongoing research in the field continues to underscore the significant impact of art on the human brain, with a particular emphasis on its implications for well-being (Cotter et al., 2023; Mastendrea et al., 2019; Secker et al., 2018). At the crux of this exploration lies the burgeoning disciplines of neuroarts and neuroaesthetics, which converge neuroscience, art, and technology to investigate this dynamic relationship (Magsamen & Ross, 2023). Neuroarts and neuroaesthetics represent interdisciplinary fields at the intersection of neuroscience and the arts, including visual arts, music, dance, and literature. Neuroaesthetics seeks to understand how the brain responds to aesthetic experiences, exploring the neural underpinnings of perception, sensation, and interpretation of art (Chatterjee & Vartanian, 2014). This field examines how different elements of artwork, such as composition, color, and texture, can trigger emotional and cognitive responses in the brain, contributing to feelings of pleasure, awe, or even discomfort.

Neuroarts extends this exploration by applying these insights to enhance well-being and cognitive function through art. It involves practical applications, such as designing therapeutic environments or creating art-based interventions for clinical populations. The goal is to harness the power of art to affect neurological and psychological outcomes positively (Magsamen et al., 2023). For instance, music therapy has been shown to improve motor and cognitive functions in patients with neurological disorders like Parkinson's disease and dementia (Thaut, 2015). These fields collectively highlight the profound impact that aesthetic experiences can have on the brain's structure and function. They promote a deeper understanding of how art influences human behavior and psychological states, paving the way for innovative therapeutic approaches that integrate artistic activities into clinical practice (Pearce et al., 2016).

Central to this discourse is the nuanced understanding that engagement with art, particularly with vibrant and colorful paintings, transcends mere

passive observation. Such artworks, characterized by their dynamic hues and intense saturation, actively stimulate neurological processes that are essential for cognitive and emotional integration. These artworks utilize a wide spectrum of vivid colors and dynamic compositions to evoke strong sensory and emotional responses. This type of art, by leveraging elements such as high contrast and bold color palettes, captures attention and enhances neural activity, thereby playing a significant role in improving mental health under various conditions. These interactions are not just visually stimulating but also facilitate a deeper emotional connection with the art, promoting psychological well-being through enhanced mood and reduced anxiety (Puranik, 2023). Encounters with such colorful art, whether directly or through digital mediums, catalyze the release of dopamine, a neurotransmitter linked to pleasure and reward. This release engenders a sense of happiness and well-being, paralleling the effects of other gratifying experiences, such as enjoying a delicious meal or the intimacy of sexual encounters. These insights suggest a somewhat universal neurological response to aesthetic stimuli, reaffirming the integral role of art in human existence. This backdrop of research sets the stage for the current study, which aims to deepen the understanding of these aesthetic experiences, particularly in the context of neurodiversity.

The burgeoning interest in how the brain responds to art stems from the historical parallel development of art and brain science as distinct disciplines. Art history and criticism, rooted in the humanities, have traditionally emphasized aesthetic judgment, cultural significance, and the interpretation of art. Conversely, neuroscience has focused on comprehending the brain's functions and structures through scientific inquiry. The works by Zeki (1999, 2007) provides an early exploration into these interactions, revealing that viewing aesthetically pleasing paintings can activate the pleasure centers of the brain, akin to the experience of seeing a loved one.

Moreover, art possesses the unique ability to engage the prefrontal cortex, a crucial brain region instrumental in focusing and deciphering meaning from sensory inputs (van Leeuwen et al., 2022). This connection highlights the role of art in cognitive processing and emotional regulation (Bigliassi, 2022). The stimulation of the prefrontal cortex by art is particularly pertinent for individuals with neurodivergent conditions. Neurodiversity, a concept recognizing the natural and valuable variation in neurocognitive functioning,

encompasses a spectrum of neurological differences not as deficits but as normal variations in the human genome (Dwyer, 2022). “Neurotypical” individuals align with societal standards in neurocognitive development and processing, often without significant deviations in neurological functioning (Radulski, 2022). In contrast, “neurodivergent” individuals exhibit variations from these standards, not indicative of inferiority but reflective of the diverse spectrum of human brain functioning. This neurodivergent group includes individuals with conditions such as Autism Spectrum Condition (ASC), characterized by unique social interactions, communication styles, and sensory sensitivities; Attention-Deficit/Hyperactivity Disorder (ADHD), with distinct attention patterns and impulsivity; dyslexia, impacting language processing; dyspraxia, affecting motor skills; and Tourette Syndrome, known for involuntary tics. Each condition presents unique challenges and strengths, contributing to the rich diversity of human neurocognitive functioning (Hulbig, 2023).

Neurodivergence and neurotypicality represent distinct constructs that describe variations in neurocognitive functioning within the human population. The concept of neurotypicality generally refers to individuals whose brain function and behavioral traits align with societal standards, which are historically constructed around the majority’s cognitive and behavioral norms (Baron-Cohen, 2002). However, this alignment does not imply a “standard” or “ideal” model of neurocognitive functioning, but rather reflects the commonality in behavioral and cognitive traits that do not deviate significantly from societal expectations.

On the other hand, neurodivergent individuals, who include those diagnosed ASC, ADHD, dyslexia, and other neurological conditions, exhibit cognitive and behavioral patterns that diverge from these conventional norms. This divergence is not merely a deviation but reflects a complex spectrum of neurocognitive variations that can offer unique perceptual, cognitive, and creative strengths (Foss-Feig et al., 2017). For instance, autistic individuals often display remarkable abilities in pattern recognition, memory, or art, challenging the notion that neurodivergence is merely a deficit compared to neurotypical standards (Grandin, 2006).

The binary classification of neurotypical and neurodivergent often oversimplifies the broad spectrum of human cognitive and behavioral

diversity. It is important to recognize that neurodivergence encompasses a range of experiences and abilities that are not just deviations but can be adaptive in various environmental contexts (Robertson & Baron-Cohen, 2017). Moreover, the societal standards themselves are dynamic and culturally influenced, shifting over time as understanding and acceptance of neurodiversity grow. Thus, it is crucial to approach discussions of neurotypicality and neurodivergence with an appreciation for the complexity and variability inherent in human neurocognitive functioning. This nuanced understanding underscores the need for more inclusive practices that recognize and value different neurocognitive profiles as part of the diverse human spectrum rather than viewing them through a deficit-oriented lens.

In support of this initiative, *NeuroTribes* (2015) by journalist Steve Silberman marked a significant shift in our perception of neurological diversity, especially regarding autism. This concept posits that neurodivergent individuals, including those on the autism spectrum, belong to a unique “tribe” or community, each with distinct characteristics, strengths, and ways of engaging with the world. This perspective fosters a move towards embracing and valuing neurodiversity, rather than viewing neurodivergent conditions solely as disorders or deficits. Investigating neurotribes entails comprehending how individuals with varied neurological profiles interact with and respond to their environments, especially in relation to sensory inputs. Experts in art and mental health are progressively acknowledging the necessity for tailored approaches to meet the specific needs of different neurotypes (Quadt et al., 2023). Such personalized methodologies can provoke diverse responses through art exposure, considering factors like exhibition design and collaboration with neurodivergent artists. In this milieu, adaptations for neurodivergent individuals are more fittingly termed “success enablers” rather than mere accommodations (Dreaver et al., 2020), serving as strategies within neuroarts to aid neurodivergent individuals in discovering their neurotribe, enhancing self-understanding, and improving life quality. Inclusive art experiences are crucial in this context, given their impact on the psycho-physical aspects of individuals (Antonelli et al., 2020).

Neurotribes are not static entities; they are dynamic and evolve as societal understanding and acceptance of neurodiversity grow. The fluidity of these tribes is influenced by several factors, including advances in diagnostic criteria, changes in educational and workplace practices, and broader

cultural shifts toward greater inclusion of neurodivergent individuals. As these communities adapt and transform, so do the social supports and networks that they develop, which can lead to changing perceptions of identity and belonging among their members (Robertson & Ne’eman, 2008). The impact of changes in neurotribes on embodied cognition—the theory that cognitive processes are deeply rooted in the body’s interactions with the world—is profound. Embodied cognition suggests that our physical interactions, sensory experiences, and the environments we navigate shape our cognitive outcomes (Wilson, 2002). For neurodivergent individuals, changes in neurotribal dynamics can alter how they experience and engage with the world. For example, increased acceptance and support within a neurotribe can enhance an individual’s ability to engage in social environments, potentially affecting their sensory processing experiences and emotional responses (Donnellan et al., 2013).

Moreover, as neurotribes evolve, the collective experiences of navigating a world designed for neurotypical individuals can lead to shared strategies among neurodivergent individuals for managing sensory overload or for enhancing communication and social interaction. These shared strategies can reinforce the community’s cultural practices, influencing how members of the neurotribe perceive and interact with both their social and physical environments, thus affecting their embodied cognition. Understanding the dynamic nature of neurotribes and their impact on embodied cognition offers valuable insights into the continuous interaction between neurodivergent individuals and their environments. This understanding not only emphasizes the need for adaptive and inclusive practices that reflect the evolving nature of neurodiversity but also highlights how changes within these communities can fundamentally influence the cognitive experiences of their members.

This present research aims to enrich our comprehension of the aesthetic preferences of neurodivergent populations, particularly those diagnosed with autism, shedding light on how they process sensory information and identify their aesthetic inclinations. Eschewing generic solutions, the study celebrates the intricate diversity inherent in human neurodiversity. Utilizing a comprehensive approach that encompasses various neurodiverse groups, it employs surveys and individual interviews to explore these individual varied experiences. The collected data is analyzed to discern specific differences

between neurotypical and autistic populations, providing insights into their distinct aesthetic preferences (Hutson & Hutson, 2023).

## Literature Review

Contemporary research on the aesthetic perceptions of autistic individuals reveals potential divergences from neurotypical individuals. The 2020 study conducted by Mazza et al. and published in *BMC Psychology* provides significant insights into the aesthetic perceptions of autistic individuals. This research sought to explore how the population experiences and evaluates beauty in comparison to neurotypical, typically developing individuals. The study utilized both explicit and implicit methods to assess aesthetic perception, aiming to uncover the depth and nature of aesthetic experiences in autistic individuals. In the explicit component of the study, participants were asked directly to rate various artworks based on their perceived beauty. The approach allowed researchers to gather self-reported data on preferences and perceptions, which were then compared to responses from neurotypical participants. The findings revealed that while autistic individuals could recognize and appreciate beauty, their ratings were often lower compared to neurotypical individuals. This discrepancy suggested that while the capacity to perceive beauty is intact, the explicit criteria or standards may differ.

In contrast, the implicit assessment involved measuring reaction times and physiological responses to aesthetic stimuli without requiring conscious evaluation from the participants. This method helped to determine how autistic individuals unconsciously respond to art, which could differ from their conscious evaluations. The study found that autistic individuals exhibited delayed reaction times and different patterns of physiological responses, indicating that their implicit processing of aesthetic information might be distinct from neurotypical individuals. These dual findings from the Mazza et al. study underscore the complexity of aesthetic perception in autistic individuals. The divergence between explicit and implicit evaluations suggests that while autistic individuals may consciously appreciate art, their subconscious reactions and the cognitive processing involved in these reactions might follow different pathways compared to those of neurotypical individuals. This research contributes to a broader understanding of neurodiversity in aesthetic perception and highlights the need for further

exploration into how sensory processing and cognitive factors influence the autistic appreciation of beauty. Furthermore, research exploring the neural underpinnings of aesthetic experiences in autistic individuals indicates a correlation between heightened autistic traits and a tendency to perceive certain images as less aesthetically pleasing (Park et al., 2018). These findings suggest distinct patterns of aesthetic perception in autistic individuals, which could bear significance for their social interactions and inform the development of new strategies to enhance social skills. However, a more comprehensive understanding of the aesthetic preferences of autistic individuals is necessary.

Neurodivergent individuals often encounter the world through a lens of unique sensory preferences and challenges (Morgan, 2019), necessitating tailored accommodations and the creation of innovative solutions to address their diverse sensory needs effectively. In fact, the consensus within the research community acknowledges a distinctive landscape of aesthetic preferences among autistic individuals. For instance, a pivotal study by Fakheir and Khalil (2023) demonstrated that autistic individuals often exhibit preferences for specific visual patterns and colors, differing markedly from neurotypical individuals. These preferences are not merely superficial but are deeply intertwined with the sensory processing differences inherent in the two populations. For instance, the affinity for certain color hues or geometric patterns may stem from the unique way that autistic individuals process visual information, potentially offering a sense of comfort or clarity in perception.

Furthermore, research by Smith (2022) explored the emotional responses of autistic individuals to various art forms. The study revealed that while neurotypical individuals might derive emotional cues from abstract art intuitively, individuals in the neurotribe often approach such artworks with a different perspective, focusing more on details and patterns rather than the emotional gestalt. This approach can lead to a divergent interpretation and emotional response to art, suggesting that autistic aesthetic appreciation is not deficient but distinctively different. Additionally, the role of sensory sensitivities in shaping aesthetic preferences cannot be overlooked. Sensory sensitivities, a common characteristic in the autistic population, profoundly influence how individuals perceive and engage with their environment, including art and aesthetics. The study by Kim et al. (2023) emphasizes the



significant role that sensory-friendly environments play in enhancing the aesthetic experiences of autistic individuals. Sensory-friendly environments are specifically designed spaces or settings that minimize sensory triggers and reduce potential sensory overload, which is a common challenge for autistic individuals. These environments are tailored to accommodate sensory sensitivities by controlling factors such as lighting, noise levels, crowd sizes, and visual clutter, thereby creating a more comfortable and accessible space for individuals who are often reactive to sensory inputs. In such settings, elements that typically pose challenges to individuals with sensory processing disorders, such as bright fluorescent lights, loud background music, or crowded spaces, are significantly modified or eliminated. For instance, museums may offer special viewing hours with dimmed lights and quiet spaces, allowing autistic individuals to engage with art without the overwhelming sensory input that would typically accompany a standard visit. Further research is needed to explore the various dimensions of sensory-friendly environments and their specific impacts on different subgroups within the neurodivergent community. Understanding these nuances will aid in the development of more inclusive public spaces that cater to the broad spectrum of sensory and cognitive profiles found in autistic individuals.

Thus, research into the aesthetic preferences of autistic individuals underscores a complex interplay of sensory processing, emotional response, and environmental factors. These findings not only contribute to a deeper understanding of the neurodiverse spectrum of aesthetic appreciation but also highlight the importance of accommodating these preferences in both artistic creation and presentation. These findings, illuminating the distinctive aesthetic preferences and perceptual experiences of autistic individuals, have been instrumental in shaping the direction and focus of the current study. The emerging understanding that autistic individuals interact with and interpret art through a unique sensory and cognitive lens has prompted a deeper exploration into this area. Recognizing the divergence in how autistic individuals process visual information, respond emotionally to art forms, and the impact of sensory sensitivities on their aesthetic experiences, the neurological factors should be investigated.

In fact, the hypothesis that aesthetic preferences are influenced by neurological factors posits that individual differences in brain structure and

function can shape how people perceive and appreciate art. This hypothesis is grounded in the growing field of neuroaesthetics, which examines the neural bases for the contemplation and creation of artwork, and suggests that brain wiring can significantly affect our aesthetic experiences. Research in neuroaesthetics has shown that specific brain regions are associated with the emotional and cognitive processing of aesthetic experiences. For example, studies have identified that the prefrontal cortex, which is involved in decision-making and emotional regulation, plays a critical role in aesthetic judgments (Cela-Conde et al., 2004). Similarly, the insula, a region linked with emotional and bodily awareness, has been shown to be activated when individuals experience beauty (Ishizu & Zeki, 2011).

Further supporting this hypothesis, work by Vessel et al. (2012) suggests that intense aesthetic experiences, or moments when art deeply moves an observer, activate the default mode network of the brain—a set of interconnected brain regions involved in internal thoughts and reflections. This finding implies that personal relevance and the resonance of an artwork with one's internal state can enhance the aesthetic experience, highlighting how personal neural context influences art perception. Moreover, studies have explored how variations in neurological conditions influence aesthetic perception. For instance, individuals with synesthesia, a condition where sensory stimulation in one modality leads to automatic and involuntary experiences in another, often report enhanced or unique aesthetic experiences (Cytowic, 2002). This suggests that neurological differences can modulate the sensory and perceptual processes underlying the appreciation of art.

Considering the study under investigation, the hypothesis is grounded in research that demonstrates that aesthetic preferences are not just different but are characterized by a distinct set of criteria influenced by neurological factors. This research seeks to delve into these criteria, exploring the nuances of how autistic individuals perceive and appreciate art compared to neurotypical individuals. By doing so, the study aims to contribute to a more inclusive and comprehensive understanding of aesthetic appreciation, acknowledging the diversity in perceptual experiences across the neurodiverse spectrum. The methodology and approach have been tailored to capture the breadth and depth of these experiences, employing a combination of surveys and interviews to gather

rich, qualitative and quantitative data. This approach is designed to not only validate the existing research but also to uncover new dimensions of aesthetic perception in autistic individuals, thereby enriching the discourse in the fields of neuroaesthetics and neurodiversity.

## Methodology

In psychological and social research, employing robust methodologies for conducting surveys and interviews is crucial for gathering accurate and reliable data. These methodologies are grounded in well-established practices that ensure the validity and reliability of the findings. Surveys are commonly used for their efficiency in collecting data from a large number of respondents across diverse demographics. Standard practices in survey methodology emphasize the importance of questionnaire design. Effective questionnaires are crafted to avoid ambiguity, reduce bias, and ensure that the questions are comprehensible and relevant to the research objectives. This often involves utilizing scaled responses, such as Likert scales, which allow for the quantification of subjective attitudes or behaviors (Vaske, 2008).

Another critical aspect of survey methodology is sampling. Employing proper sampling techniques, such as random sampling, ensures that the sample represents the broader population, thereby enhancing the generalizability of the results. This step is vital to avoid sampling bias, which can skew the data and lead to inaccurate conclusions (Bryman, 2012). Additionally, pilot testing the survey with a small segment of the target population is a standard practice. This preliminary step helps identify potential issues in the questionnaire design, such as confusing or leading questions, and it allows researchers to make necessary adjustments before full-scale administration (Presser et al., 2004). The administration of the survey is equally important and can be conducted via various methods including online, telephone, mail, or face-to-face. Each mode of administration has its advantages and challenges, and the choice depends on the research context and objectives (Groves et al., 2009).

Interviews, particularly qualitative ones, offer a depth of data that surveys cannot, capturing the richness of respondent experiences and emotions. Developing an effective interview guide that includes open-ended questions is fundamental. These questions should facilitate a comprehensive discussion

on the topic under study, allowing participants to express their thoughts freely while staying relevant to the research questions (Rubin & Rubin, 2011). Training interviewers is another crucial practice. Interviewers must be skilled in the techniques of asking questions neutrally without leading the participant, in managing sensitive topics, and in ensuring consistency across interviews to prevent interviewer bias from affecting the responses (King & Horrocks, 2010). Ethical considerations also play a significant role in conducting interviews. Researchers are obligated to obtain informed consent from participants, ensuring they understand the purpose of the research and their rights. Maintaining confidentiality and the ethical handling of interview data, such as anonymizing transcripts, are practices that protect participant privacy and the integrity of the research process (DiCicco-Bloom & Crabtree, 2006).

These considerations were followed in the study at hand, which involved a total of 94 participants, with a demographic breakdown as follows: 45 individuals self-identified as autistic, 22 as neurotypical, and the remaining 27 participants reported other forms of neurodivergence. Participants were recruited through various channels, including online forums, support groups for neurodivergent individuals, and social media platforms dedicated to neurodiversity. The inclusion criteria required participants to be above 18 years of age and to self-identify as either neurotypical, autistic, or having another neurodivergent condition. The survey was meticulously crafted to assess aesthetic preferences in a nuanced manner and was approved by the Lindenwood University Institutional Review Board (IRB). It included a range of visual stimuli encompassing different art styles, color schemes, and complexity levels. Questions were designed to gauge participant emotional responses, preference patterns, and subjective interpretations of the art pieces.

The survey was disseminated electronically using a secure online platform, ensuring accessibility for participants across various locations. Responses were collected anonymously to encourage candidness and reduce potential biases. A subset of participants (15 from each group) was randomly selected for follow-up interviews. These semi-structured interviews aimed to delve deeper into the survey responses, allowing participants to elaborate on their aesthetic preferences and the perceived influence of their neurocognitive traits on these preferences. The survey data were analyzed using statistical

methods to identify trends and differences in aesthetic preferences among the three groups. Qualitative data from interviews were subjected to thematic analysis to extract nuanced insights into the participant experiences and perceptions. Ethical approval for the study was obtained from the relevant institutional review board. Participants were informed about the purpose of the study, their voluntary participation, confidentiality, and the right to withdraw at any point without any consequences. The methodological framework was designed to ensure a comprehensive understanding of the aesthetic preferences across the neurodiverse spectrum, with a particular focus on contrasting these preferences between autistic individuals, neurotypical individuals, and those with other neurodivergent conditions.

## Results

### Demographic Information

In this study, a diverse group of 94 individuals participated, with a notable representation from the neurodivergent community. Among them, 45 identified as autistic, 22 as neurotypical, and the remaining participants reported other neurodivergent conditions. The self-reported autistic population exhibited a variety of co-occurring conditions, including dyslexia (6.67%, n=3), dysgraphia (2.22%, n=1), ADHD (24.44%, n=11), PTSD (6.67%, n=3), and others categorizing under Autism Spectrum Disorder (ASD) (24.44%, n=11), with 22.22% (n=10) specifically identifying as autistic and 6.67% (n=3) with Asperger's syndrome.

The demographic profile of the autistic population within the study was diverse in terms of age, gender identity, ethnicity, and education. The age range of participants was broad, with the majority falling within the 45-54 age group (31.25%, n=5). In terms of gender identity, the group was predominantly female (62.50%, n=10), with males constituting 31.25% (n=5) and a smaller percentage identifying as genderqueer/genderfluid (6.25%, n=1). The majority of participants were non-Hispanic/Latinx (93.75%, n=15), with a predominantly white/Caucasian ethnic background (66.67%, n=12).

Sexual orientation among participants varied, with 50% (n=8) identifying as heterosexual/straight, followed by bisexual (18.75%, n=3) and pansexual

(18.75%, n=3) orientations. The educational background of the group was notably high, with the largest proportion holding a master's degree (31.25%, n=5), followed by bachelor's (25%, n=4) and doctoral degrees (12.50%, n=2). The primary language spoken at home was overwhelmingly English (100%, n=16). In terms of physical disabilities, 43.75% (n=7) reported none, while others reported visual impairment (12.50%, n=2), hearing impairment (6.25%, n=1), and mobility or physical disabilities (25%, n=4).

The demographic profile of the neurotypical participants in this study presents a contrasting landscape when compared to the autistic population. In total, 18 neurotypical individuals participated, with a diverse age distribution. The age range was broad, encompassing various groups from 18-24 years (11.11%, n=2) to 65 or older (5.56%, n=1). The majority of participants fell within the 45-54 and 55-64 age brackets, each accounting for 22.22% (n=4) of the cohort. Gender representation in the neurotypical group showed a female majority at 66.67% (n=12), while males constituted 33.33% (n=6). In terms of ethnicity, the majority were non-Hispanic/Latinx (86.67%, n=13), and the predominant racial background was white/Caucasian (88.89%, n=16). This demographic skew contrasts with the more varied ethnic background of the autistic group. The sexual orientation of the neurotypical participants was predominantly heterosexual/straight (88.89%, n=16), with a smaller representation of bisexual individuals (5.56%, n=1). Educational levels among this group were notably high, with the largest proportion holding a master's degree (44.44%, n=8), followed by those with a bachelor's degree (33.33%, n=6). This distribution aligns closely with the educational background of the autistic population, which also exhibited a high level of academic achievement.

Language diversity was more pronounced in the neurotypical group, with 66.67% (n=12) speaking English at home, alongside representations of other languages such as Arabic (5.56%, n=1) and Portuguese (11.11%, n=2). A few participants reported speaking multiple languages at home. Physical disabilities were less reported in the neurotypical group, with 94.44% (n=17) indicating no physical disability. This contrasts with the autistic group, where a higher percentage reported various physical disabilities. Overall, the neurotypical group presents a demographic profile that, while sharing some similarities, notably differs in aspects of gender distribution, ethnic diversity, language variety, and physical disability prevalence compared to the autistic

population. This demographic information provides a vital backdrop for analyzing and understanding the differences in aesthetic preferences and perceptions between the two groups.

### **General Experiences with Art**

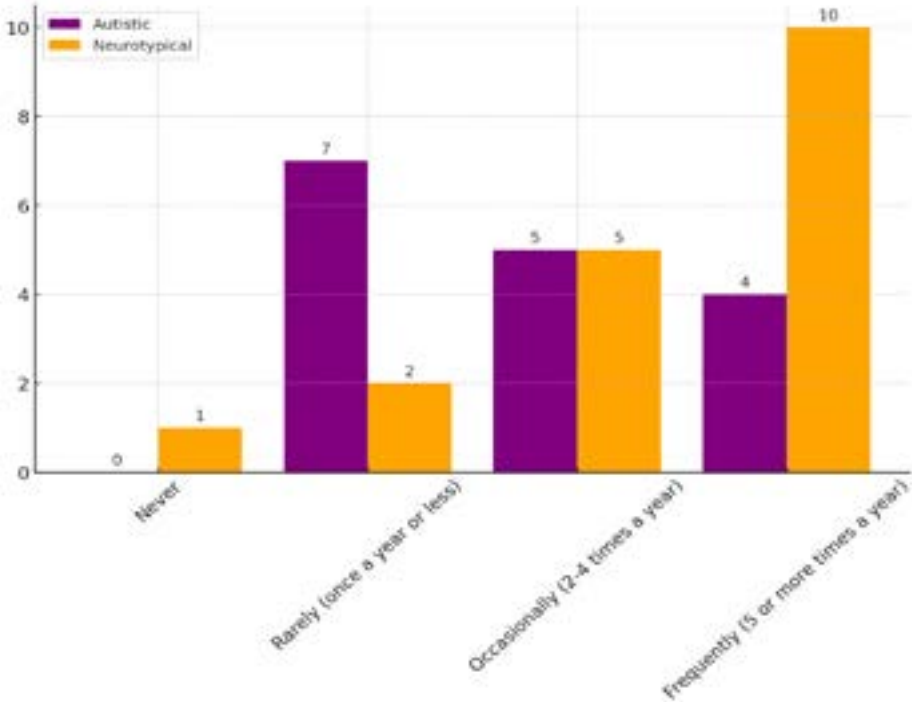
In the autistic population of this study, the engagement with art, both in physical and digital spaces, and the sensory experiences associated with it were explored through a series of questions. Participants were asked about their frequency of visiting museums or art galleries. The responses indicated a varied level of engagement, with 43.75% (n=7) reporting rare visits (once a year or less), 31.25% (n=5) visiting occasionally (2-4 times a year), and a notable 25% (n=4) visiting frequently (5 or more times a year). This suggests that while a significant portion of the autistic population in the study engages with art in physical spaces, the frequency of such engagements varies considerably. When asked about viewing art on desktops, tablets, or mobile devices for enjoyment, a substantial 50% (n=8) of the participants indicated that they engage with art digitally on a daily basis. Additionally, 25% (n=4) view art 2-3 times a week, and 12.50% (n=2) do so 4-6 times a week, indicating a strong inclination towards digital mediums for experiencing art.

The study also investigated the frequency of strong sensory reactions (e.g., goosebumps, tingling, emotional overwhelm) when engaging with art. Half of the participants (50%, n=8) reported experiencing such reactions sometimes, while 25% (n=4) always have strong sensory reactions. A smaller proportion, 18.75% (n=3), indicated that they experience these reactions most of the time. This data points to the profound sensory impact that art can have on autistic individuals. When asked if their neurodivergence influences how they perceive or engage with art, an overwhelming 87.50% (n=14) of participants believed it had a positive influence. This suggests a strong correlation between their neurodivergent characteristics and their art engagement and perception.

These results demonstrate a diverse and significant engagement with art among the autistic population, characterized by varying frequencies of museum visits, a strong preference for digital art mediums, frequent sensory reactions to art, and a predominant belief that their neurodivergence positively influences their art perception. The experiences of the

neurotypical population with art, as revealed in the study, provide an interesting contrast to those of the autistic population. For the neurotypical participants, the frequency of visiting museums or art galleries was generally higher than in the autistic group (Figure 1). A significant 55.56% (n=10) of neurotypical participants reported frequent visits (5 or more times a year), followed by 27.78% (n=5) who visit occasionally (2-4 times a year). Only 5.56% (n=1) of the neurotypical participants never visit art galleries or museums,

**Figure 1. Frequency of Museum Visits**



indicating a stronger overall engagement with physical art spaces compared to the autistic group.

Similar to the autistic group, a high percentage of neurotypical participants (55.56%, n=10) engage with art on digital platforms daily. Additionally, 16.67% (n=3) view art once a week, and another 16.67% (n=3) do so 2-3 times a week. This data suggests that, like their autistic counterparts, neurotypical



individuals also have a significant inclination towards digital mediums for experiencing art. In terms of sensory reactions to art, 72.22% (n=13) of the neurotypical participants experience strong sensory reactions sometimes, while 5.56% (n=1) experience them always, and another 5.56% (n=1) most of the time. About half the time, 16.67% (n=3) of participants have these reactions. This finding indicates that while neurotypical individuals also experience sensory reactions to art, the frequency of such experiences is different from the autistic group, with a higher percentage reporting occasional sensory reactions.

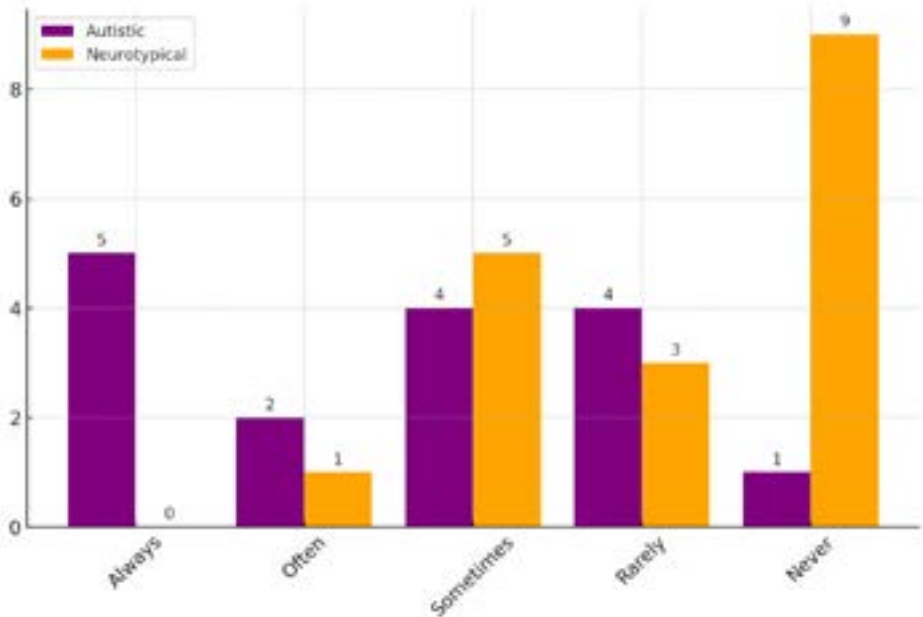
When comparing the autistic and neurotypical groups, several differences and similarities emerge. Both groups show a strong engagement with digital art platforms, with a significant proportion viewing art daily. However, the neurotypical group tends to visit physical art spaces more frequently than the autistic group. In terms of sensory reactions to art, while both groups experience such reactions, the frequency and intensity of these experiences differ, with the autistic group more likely to report frequent and intense sensory responses. This contrast underscores the unique ways in which autistic individuals interact with and perceive art compared to neurotypical individuals.

### **Sensory Crossovers**

In examining the specific sensory experiences and reactions to art among those reporting autism, the study revealed a rich tapestry of synesthetic experiences and unique emotional engagements with art (Figure 2). A substantial majority of the autistic participants (87.50%, n=14) believed that their neurodivergence positively influences their perception and engagement with art. This suggests a strong correlation between their neurodivergent characteristics and how they experience art. The occurrence of synesthesia, or sensory “crossovers,” was notably prevalent in this group. A significant 31.25% (n=5) of participants always experience synesthesia, with 25.00% (n=4) experiencing it sometimes and another 25.00% (n=4) rarely. Only 6.25% (n=1) reported never experiencing synesthesia. This indicates a heightened sensory interconnectedness in the autistic population. The forms of synesthesia reported varied widely. Participants described experiences like seeing specific colors when hearing sounds (14.29%, n=3), feeling tactile sensations when observing visual patterns (4.76%, n=1), and associating days

of the week or months with distinct colors (9.52%, n=2). Some participants also reported unique associations like tasting flavors in response to words or numbers (4.76%, n=1) and feeling textures when exposed to specific scents (14.29%, n=3).

**Figure 2. Experience of Sensory Crossovers or Synesthesia**



In response to associating numbers or letters with specific colors, tastes, or smells, 18.75% (n=3) of participants often experience this, while 43.75% (n=7) never do. This highlights that while synesthetic experiences are common in the autistic population, they are not universal. Regarding emotional reactions to art, 50.00% (n=8) of autistic participants find their reactions significantly more intense than others, and 25.00% (n=4) find them somewhat more intense. This indicates a heightened emotional response to art among many autistic individuals. Participants shared personal anecdotes about their experiences with art, revealing diverse perspectives. Some described art as expansive, integrative, and a means of hyper-focusing, cutting through the noise of the world. Others pondered the creative process, questioning whether emotions or motivations drive art creation and its communicative

language. These findings from the autistic population highlight the profound and diverse sensory and emotional engagements with art, shaped by their unique neurodivergent perspectives. The prevalence of synesthetic experiences and the intensity of emotional reactions underscore the complex relationship between neurodivergence and art perception.

In the neurotypical group, 50.00% (n=9) reported never experiencing sensory “crossovers” or synesthesia, a significant contrast to the autistic group where such experiences were more common (Figure 4). Only 5.56% (n=1) of neurotypical participants often experience synesthesia, and 27.78% (n=5) sometimes do, indicating a lower prevalence and intensity of synesthetic experiences compared to the autistic population. The types of synesthesia experienced by the neurotypical group also varied. Some participants reported seeing specific colors when hearing sounds (16.67%, n=3) and feeling tactile sensations in response to visual patterns (16.67%, n=3). However, the diversity and frequency of these experiences were less compared to those reported by the autistic participants.

When associating numbers or letters with specific colors, tastes, or smells, a similar trend was observed, with 38.89% (n=7) of neurotypical participants never experiencing this, and only 16.67% (n=3) often doing so. Regarding emotional reactions to art, 16.67% (n=3) of neurotypical participants find their reactions significantly more intense than others, and 44.44% (n=8) find them somewhat more intense. This suggests that while neurotypical individuals can have strong emotional responses to art, the frequency and intensity might be less pronounced compared to the autistic group.

The experience of time as a spatial dimension and preferences for types of art also showed variability in the neurotypical group, with a mix of responses indicating a diverse range of experiences and preferences. While both autistic and neurotypical populations experience sensory crossovers and have emotional reactions to art, the autistic group demonstrates a higher frequency and intensity of synesthetic experiences and more intense emotional responses. These findings highlight the unique sensory and perceptual experiences of the autistic population in relation to art, compared to their neurotypical counterparts.

## Discussion

In terms of engagement with art, both autistic and neurotypical populations show a strong inclination towards art, but their modes of engagement differ notably. Autistic participants demonstrated a marked preference for digital art platforms, engaging with art daily, which could be attributed to the controlled, predictable nature of digital environments that align with their sensory needs. In contrast, neurotypical individuals frequented physical art spaces more often, suggesting a comfort with the sensory variability these environments present. This difference underscores the importance of considering sensory preferences and sensitivities in making art accessible to autistic individuals.

A striking finding is the prevalence of synesthetic experiences among the autistic participants. This group reported a higher frequency and intensity of sensory crossovers, such as associating colors with sounds or experiencing tactile sensations in response to visual patterns. This heightened sensory interconnectedness suggests a more integrated sensory processing in autism, influencing their perception and appreciation of art. In contrast, neurotypical individuals experienced synesthesia less frequently, indicating a more segregated sensory processing. This disparity highlights the unique ways in which autistic individuals interact with and interpret sensory stimuli, which is crucial in understanding their aesthetic experiences.

Emotional responses to art also varied between the groups. Autistic individuals reported more intense and frequent emotional reactions to art, suggesting that art may evoke a deeper level of emotional engagement in this group. This could be due to their unique sensory processing or a heightened emotional sensitivity, leading to a more immersive experience. Neurotypical individuals, while also experiencing strong emotional responses, did not report the same level of intensity or frequency. This difference points to the potential of art as a powerful medium for emotional expression and experience for autistic individuals.

The majority of autistic participants perceived their neurodivergence as positively influencing their perception and engagement with art. This self-reported positive influence highlights a distinctive autistic aesthetic perspective, where neurodivergent traits are not seen as hindrances but

as enriching factors in art appreciation. In contrast, the neurotypical group did not report a similar direct influence of cognitive traits on art perception, suggesting that neurodivergent individuals may have unique ways of experiencing and interpreting art. Preferences for different types of art varied across both groups, reflecting individual tastes and inclinations. However, the diverse range of preferences expressed by the autistic participants may be linked to their specific sensory experiences and synesthetic interactions. This diversity underscores the need for a broad spectrum of artistic expressions to cater to the varied aesthetic preferences within the autistic community.

The key takeaways on autistic aesthetics from this study are manifold. Firstly, there is an enhanced sensory interconnectedness in autistic individuals, leading to unique sensory and synesthetic experiences with art. Secondly, autistic individuals exhibit a broad spectrum of aesthetic preferences, influenced by their distinct sensory processing. Thirdly, art can evoke more intense emotional responses in autistic individuals, suggesting a deeper level of engagement with art. Fourthly, many autistic individuals view their neurodivergence as positively impacting their art experience, indicating a unique autistic aesthetic perspective. Lastly, these findings have significant implications for artistic endeavors and therapies, highlighting the need for inclusive approaches that recognize and cater to the diverse aesthetic experiences of neurodivergent individuals. Therefore, this study illuminates the rich and complex landscape of autistic aesthetics, characterized by unique sensory, emotional, and cognitive interactions with art. These findings advocate for a more inclusive understanding of aesthetics, encompassing the diverse perspectives and experiences of both neurotypical and neurodivergent individuals. Recognizing and embracing these differences is crucial in fostering environments that support and celebrate the full spectrum of human aesthetic experience.

## **Conclusion**

This study was initiated against a backdrop of burgeoning interest in the intersection of neurodiversity and aesthetics, particularly in understanding how autistic individuals spectrum disorder (ASC) perceive and engage with art compared to their neurotypical counterparts. Recognizing the distinct sensory processing and emotional responses of the autistic population,

this research aimed to deepen our understanding of autistic aesthetics, thereby contributing to the growing field of neuroarts and neuroaesthetics. The study employed a comprehensive methodology, involving a survey and interview approach, to gather data from 94 participants, including individuals who identified as having autism, neurotypical individuals, and those with other neurodivergent conditions. This mixed-method approach enabled a rich exploration of participants' aesthetic preferences, sensory experiences, and emotional reactions to art, providing both quantitative and qualitative insights.

The significance of the results from this study is profound. Firstly, it highlighted the heightened sensory interconnectedness in autistic individuals, as evidenced by their more frequent and intense synesthetic experiences. Secondly, the study revealed that autistic individuals often experience more intense emotional reactions to art, suggesting a deeper level of engagement and immersion. Thirdly, the majority of autistic participants viewed their neurodivergence as positively influencing their perception and interaction with art, indicating a unique autistic aesthetic perspective. These findings are crucial in challenging and broadening traditional notions of aesthetics, emphasizing the need to recognize and value the diverse sensory and perceptual experiences of the neurodivergent population.

Moving forward, the insights from this study pave the way for several next steps. There is a clear need for further research to explore the specific mechanisms underlying the unique aesthetic experiences of autistic individuals. Additionally, these findings have practical implications for the fields of art creation, exhibition design, and art therapy, underscoring the importance of developing inclusive and sensory-sensitive approaches that cater to the diverse needs and preferences of the neurodivergent community. Ultimately, this study contributes to a more inclusive understanding of beauty and art, advocating for a recognition and celebration of neurodiversity in the artistic and cultural realms.

## Data Availability

Data available upon request.

## Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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NA

## Authors' Contributions

Conceptualization, J. Hutson; Methodology, P. Hutson; Validation, P. Hutson; Investigation, P. Hutson – Original Draft Preparation, J. Hutson; Writing – Review & Editing, J. Hutson.; Visualization, J. Hutson.

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**Piper Hutson** has over sixteen years of experience curating at galleries across the country and has co-curated over forty exhibitions during her multiple positions, as well as head curating ten shows in the past five years. She completed her EdD at Lindenwood University with her dissertation work entitled *The Role of Education in the Art Viewing Experience*, comparing the evolution of learning in museums and corporate art collections. With a focus on 19th c. British art, she is also an adjunct professor having taught a variety of courses for 8 years, both online and on ground. Her current work with improving inclusivity in cultural heritage collections for neurodiverse populations. She has co-authored several works on inclusivity in the workplace and best practices on supporting neurodiversity in cultural heritage institutions.