

RUNNING HEAD: HOW DOES ART SHAPE EMOTIONAL PROCESSES THROUGH
SENSE-MAKING

**How does art shape emotional processes through sense-making: A developmental
perspective.**

Thesis Submitted in Partial Fulfillment of the
Requirements for the Degree of
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Master Thesis

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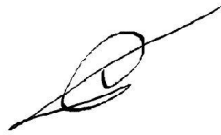
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Date: 22-5-2023

Place: Groningen

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Abstract

This research delves into children's engagement with art and personal artifacts, aiming to comprehend the multifaceted nature of their experiences through an enactive-embodied-interactive approach. Drawing upon the insights of Dewey (1934) and contemporary scholars like Brink (2018) and Van Klaveren, Ueding, and Cox (2019), the study explores how children, aged 6 to 11, interact with art, considering elements such as craftsmanship, emotional resonance, and visual aesthetics. A cognitive semiotic perspective is adopted to understand the dynamic nature of artistic encounters, emphasizing the role of cognitive processes in shaping individuals' interactions with art. The study investigates basic features, emotional resonance, thought-provoking ability, and storyline as integral aspects of sense-making during artistic experiences. Furthermore, it considers the developmental trajectory of art appreciation, examining age-related cognitive development and the influence of personal narratives on individuals' engagement with art. The findings suggest a shift from emotionally focused interpretations to more cognitively informed analyses across age groups, with younger children exhibiting intense emotional reactions and older children demonstrating a nuanced understanding of art. The study aligns with Piaget's stages of cognitive development, highlighting discrepancies possibly due to individual differences and environmental factors. Moreover, it emphasizes the influence of affective, behavioral, and semiotic factors on art interpretation, underscoring the need for a comprehensive understanding of the human experience of art. In conclusion, this study provides valuable insights into children's art experiences, serving as a starting point for further exploration of emotional experiences, cognitive development, and artistic expression. It calls for future research to unravel the complex interplay between these factors, considering individual differences, social and cultural contexts,

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and the impact of different art activities on children's development. By examining the multifaceted dimensions of artistic encounters, the study aims to deepen our understanding of the intricate relationship between children, art, and personal artifacts.

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Preface and Acknowledgements

This thesis is made as a completion of the master Arts Cognition and Criticism at the University of Groningen. Several people have contributed academically and with support to this master thesis. I would like to thank my first supervisor dr. R.F.A. Cox for all the support throughout the weeks working on this thesis. I would also like to thank Gemma Schino for contributing to my work with several good ideas and working together while acquiring data for the research. I'd like to thank all the children and parents who contributed to the research and brought their artworks to talk about them to us. I would like to thank my friends and family for always supporting me. And lastly I would like to thank my girlfriend Azra for her patience, support, encouragement and love.

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Introduction

Dewey (1934) posits that human experience originates from the interaction with the environment, giving rise to meaning. He illustrates this interactive engagement in artistic experiences, involving the senses, organs, and nervous and muscular systems. Art, according to Dewey, is a process of crafting with materials, including the body, external elements, and tools, resulting in something visible, audible, or tangible shaped by the artist's interaction with their surroundings. Dewey argues that the experience of art stems from the artist's connection with the world, leading to a transformative encounter through the reconstruction of the artwork. This perspective is echoed by scholars like Brink (2018) and Van Klaveren, Ueding, and Cox (2019). In the act of engaging with art, the audience interprets their emotions, sensations, actions, and cognitions, ultimately contributing to the creation of meaning. According to van Heusden (2022), human sense-making encompasses four interrelated strategies: perceptual, imaginative, conceptual, and analytical. To broaden our perspective on analyzing sense-making creatively, we will adopt an enactive-embodied-interactive approach (De Jaegher, 2013) in understanding art sense-making. Our aim is to identify individuals' sense-making processes during artistic experiences, emphasizing basic features (such as line, shape, form, space, value, color, and texture), emotional resonance (including emotion words, sensations, moods, and feelings), thought-provoking ability (such as insights, curiosity, and changes in perception), and storyline (involving memories, associations, and imaginative power).

Artful experiences elicit a multifaceted interplay of affective, physiological, behavioral, and semiotic factors (Jorna & Van Heusden, 2003; van Heusden, 2022). These aspects are intricately interwoven, influencing how we interpret and make sense of art.

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Artful experiences elicit a multifaceted interplay of affective, behavioral, and semiotic factors (Jorna & Van Heusden, 2003; van Heusden, 2022). These aspects are intricately interwoven, influencing how we interpret and make sense of art.

Affects, the subjective experiences of emotions and feelings, play a crucial role in shaping our responses to art. For instance, a somber painting may evoke feelings of sadness or melancholy, while a lively piece of music might induce feelings of joy and excitement. Behavioral processes, such as movements, facial expressions, and gestures, are also integral components of artful experiences (Jorna & Van Heusden, 2003). We may sway to the rhythm of a song, gesture in response to a painting, or become engrossed in a book, all of which contribute to our overall engagement with the artwork.

Semiotic processes, involving the interpretation and meaning-making of art, are the foundation of our understanding of art (van Heusden, 2022). We draw upon our past experiences, knowledge, and cultural background to construct meaning from art, connecting the artwork to our personal narratives and understanding of the world. To better understand this complex interplay of factors, we adopt an enactive-embodied-interactive approach (De Jaegher, 2013) to art sense-making. This approach emphasizes the embodied and interactive nature of our experiences, recognizing that we actively engage with and make meaning from art through our bodies, interactions, and social contexts. We focus on four key aspects of sense-making:

Basic features: We examine how participants attend to and interpret the basic elements of art, such as line, shape, form, space, value, color, and texture. This includes identifying the patterns and relationships between these elements.

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Emotional resonance: We explore how participants experience and express emotions in response to art. This includes analyzing their verbal responses, as well as their non-verbal cues such as facial expressions, body language, and tone of voice

Thought-provoking ability: We investigate how art can stimulate thought and reflection. This includes identifying the insights, questions, and changes in perspective that participants experience in response to the artwork.

Storyline: We examine how participants create or connect with a narrative or story in response to art. This includes identifying the memories, associations, and imaginative connections that participants make with the artwork.

This study delves into the developmental aspects of art appreciation, exploring how individuals' understanding and engagement with artworks evolve throughout their lives. Through examining the experiences of participants across different age groups, we aim to gain insights into the changing patterns of art appreciation and the influence of personal narratives on our interactions with art.

Specifically, we hypothesize that age-related cognitive development, as defined by Piaget's stages of cognitive development, will play a significant role in shaping individuals' emotional responses to significant artworks. Children in the concrete operational stage, characterized by concrete thinking and limited ability to grasp abstract concepts, are expected to exhibit more intense and immediate emotional reactions compared to children in the formal operational stage, who possess the cognitive capacity for abstract reasoning and symbolic representation. We also anticipate that the emotional complexity as measured by the Geneva Emotion Wheel will increase with age, reflecting the advancement of cognitive development and the ability to appreciate the nuances of emotional expression in art.

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Furthermore, we propose that the personal narratives and life experiences of individuals will exert a profound influence on their engagement with art, particularly during younger ages. As children's understanding of the world is largely shaped by their personal experiences, their interpretation of artworks will be deeply intertwined with their own narratives and worldviews. This influence is expected to diminish with age, as individuals develop greater independence from personal experiences and a capacity for abstract thought, allowing them to engage with art on a more universal and intellectual level.

Overall, this study seeks to unravel the developmental trajectory of art appreciation, exploring how cognitive abilities, personal narratives, and emotional responses shape our interactions with art across different age groups. By examining the multifaceted dimensions of artistic encounters, we aim to gain a deeper understanding of the human experience of art and its profound impact on our lives.

Emotion and art

Chupchik (2016) suggests that emotions, as fundamental phenomena, arise from bodily and mental resonances to real or imagined situations. The psychology of emotions serves as a starting point for understanding emotional responses to art (Silvia, 2005), stemming from the recognition that emotions encompass more than just states of high arousal.

Throughout history, art has been intricately linked with human emotions, serving to evoke, shape, and alter feelings (Silvia, 2005). Art offers profound and emotionally charged experiences, whether through engagement with characters in television shows or deep connection with various artistic forms such as poetry or music (Matravers, 1998). Despite the ubiquity of art in human culture, debates persist regarding its direct utility (van Heusden, 2015; Leder et al., 2012).

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When encountering art, viewers swiftly and automatically process perceptual cues, with fluent processing often leading to positive emotional states (Leder et al., 2014). Subsequent stages involve explicit processing of features such as artistic style or content, influencing evaluations based on both cognitive and emotional responses (Leder et al., 2014). Recent cognitive theories of emotion emphasize the role of evaluation rather than the event itself in shaping emotional experiences (Izard, 2009). Appraisal theories highlight the contextual nature of emotions, wherein situational factors can significantly impact emotional responses (Roseman & Evdokas, 2004). Individual differences and situational contexts contribute to the wide variability in emotional responses to art (Silvia, 2005).

In summary, art offers individuals valuable and emotionally charged experiences, with initial processing stages influencing subsequent emotional responses. The contextual evaluation of events plays a pivotal role in shaping emotional experiences, leading to diverse reactions to artistic stimuli. These insights are crucial for understanding and measuring emotional responses to art.

Emotions, cognition and art.

Upon encountering a work of art, our initial encounter involves rapid and automatic processing of perceptual hallmarks of the stimulus (Leder et al., 2014). A smooth and effortless processing of this initial stage is associated with a more positive emotional state (Leder et al., 2014). Subsequent stages of understanding the artwork involve more explicit processing of its features, including the style, content, instruments, and composition in the case of music. These evaluations are influenced by both cognitive appraisals of the artwork and the viewer's emotional responses (Leder et al., 2014). It's important to acknowledge the reciprocal relationship between thoughts and feelings, or cognitions and emotions (Leder et al., 2014).

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Recent cognitive theories of emotion have gained prominence in the scientific study of emotions (Izard, 2009). These theories emphasize the central role of appraisal, suggesting that not the event itself but our evaluation of that event determines our emotional experience (Izard, 2009). This contextual approach to emotion recognition highlights the influence of situational factors on appraisals (Roseman & Evdokas, 2004). For instance, an individual experiencing a particularly challenging day may be more prone to anger than on a more favorable day. This aligns with the widely varying emotional responses to art (Silvia, 2005). Moreover, the same emotion can be elicited by different stimuli; one might feel happiness upon passing an exam or upon receiving news of a friend's pregnancy (Roseman & Smith, 2001).

In conclusion, art possesses the ability to provide individuals with valuable and emotionally charged experiences. The early stages of art appreciation involve automatic processing that can influence the emotions experienced. The appraisal of an event, rather than the event itself, determines our emotional response, emphasizing the contextual nature of emotions. Additionally, emotional responses to art can vary widely due to individual differences and situational factors. These findings underscore the need for careful consideration of these factors when measuring emotional responses to art

The Nature of Artistic Experiences: A Cognitive Semiotic Perspective

Cognitive semiotics offers a unique lens for understanding the nature of artistic experience. This approach emphasizes the role of human cognition in shaping our interactions with art, highlighting the active and interpretive nature of the artistic process. According to cognitive semiotics, the artistic experience is not inherent to the object or artifact itself, but rather emerges from the cognitive processes we engage in when encountering art.

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In cognitive semiotics, a crucial distinction lies between the object itself and its utilization. In the realm of art, an object doesn't possess inherent artistic value; rather, it acquires artistry through its usage. Thus, the artistic encounter isn't solely dictated by the object's physical attributes but also by our cognitive and cultural interpretations (van Heusden, 2015). Several cognitive mechanisms contribute to the artistic experience. One key element is pattern recognition. Our brains are naturally inclined to seek patterns in our sensory experiences, and artworks often present patterns or arrangements that trigger cognitive responses. Through pattern recognition, we identify and extract meaningful information from the artwork, such as recurring motifs, visual rhythms, or narrative structures. This process allows us to connect disparate elements and perceive coherence within the artwork (Donald, 2006; van Heusden, 2015).

Alejandra Wah (2017) proposes that the artistic experience is characterized by a cognitive strategy called reflective imagination. This cognitive process involves creating mental representations based on past experiences, emotions, or ideas. This process can be triggered by any emotionally competent stimulus, whether it be an institutional artwork, a recalled memory, or an imagined scenario (Wah, 2017). From a cognitive semiotic perspective, art can be viewed as a tool for making sense of the world. We use art to reflect on our experiences, emotions, and beliefs, and to connect with others on a deeper level. This process of sense-making is facilitated by the interplay of sensorimotor actions, learned behaviors, and semiotic interpretation.

The first layer of this process is sensorimotor actions, which form the foundation of our artistic experiences. This includes the physical sensations we experience when we interact with art, such as the sound of music or the visual appearance of a painting (van Heusden, 2010, 2011).

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The second layer is based on learned behaviors or habits that can be acquired through exposure to art or cultural norms. For example, we learn to sit quietly and listen attentively in a concert hall (van Heusden, 2015).

The third layer is semiotic sense-making, which involves interpreting the meaning of art using our cognitive abilities. This can involve first-order sense-making, which focuses on the immediate qualities of the artwork, such as its visual or auditory properties. Second-order sense-making goes beyond the surface features of the artwork and explores its deeper meaning and significance. (Donald, 2016; van Heusden, 2011)

A developmental perspective

The late 19th century saw a rise of interest in artistic endeavors of children. This era was characterized by significant social, cultural, and intellectual shifts that prompted scholars and educators to turn their attention towards understanding the nature of children's artistic expressions (Golomb, 2003). The late 19th century was marked by the rise of the romantic movement, which had a fascination with untamed spontaneous aspects of the arts (Golomb, 2003). The exploration of child art is marked by a fascinating dichotomy between the viewpoints of modernist artists and developmental psychologists. Firstly developmental psychologists saw conceptual limitations of developmental stages of children in the art of these children, such as the developmental stages created by Piaget which state that children in the preoperational period attain semiotic functions in their art. In contrast to this, modernist artists of the early 20th century, influenced by movements like Cubism, Surrealism, and Abstract Expressionism, held the authenticity and spontaneity of children's artistic endeavors in high regard. Figures such as Pablo Picasso and Wassily Kandinsky were drawn to the uninhibited creativity and lack of self-consciousness exhibited in children's art. The child's ability to create without preconceived

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notions or adherence to formal rules was seen as a source of inspiration and a pathway to artistic purity (Golomb, 2003).

Children engage with art, dance, music and theatre in their day to day lives. According to Callaghan & Rochat (2003) children begin to consider artists their emotional state in their judgment of art. This is quite young for these types of considerations of art, showing children can have sophisticated ideas on art from quite a young age. Another aspect of children's engagement in the arts which shows a form of sophistication while looking at art is that children appreciate authenticity. Something which adults are also known to really appreciate in the arts (Hood et al., 2012; Hood & Bloom, 2008).

Existing research has yet to fully explore the development of aesthetic appreciation from the ubiquitous childhood artistic activities such as body movement, singing lullabies, scribbling, and engaging in pretend play. The question arises: How does a child transition from engaging in or observing art to possessing an adult-like aesthetic appreciation, particularly when they are not an artist themselves?

Moreover, it is worth considering the times when children are not appreciating the artistic and aesthetic qualities of their surroundings. Children inhabit a world filled with color, shape, movement, song, and pretend play. Their lives are inherently artistic, as adults might define it. While they may not be consciously evaluating these experiences as artistic, they are interacting with them in a manner that mirrors how adults engage with the arts.

Gopnik (2016) describes this as “lantern consciousness,” a global attention to the environment, as opposed to the “spotlight consciousness” more typical of adults. This broad attention to their environment provides children with experiences that will inevitably shape their

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understanding of the arts. The challenge, therefore, lies in maintaining this interest and enjoyment as children mature into adults.

A multi-method approach for investigating experiences of art

Experiencing art is a complex interplay of different factors. Art can evoke a lot of differing responses. These can range from all the variation in subjective thoughts and feelings, which can in turn be combined with bodily changes and behavioral changes. Therefore we can distinguish between three dimensions of this experience: semiotic, physiological and behavioral.

Embodied cognition theories say that perception of the world is linked to bodily experiences. Bodies provide the basis of how we can engage, perceive and understand our environment (Pelowski et al., 2023). This comes from the James-Lange theory (James, 1884) which proposes that emotional feelings and changes stem from changes in bodily physiology. On the basis of this idea contemporary theories of emotion and embodied cognition suggest that physiological changes take on a very important role in the definition of emotional experience.

Piaget's Four Stages of Cognitive Development:

Piaget's theory of cognitive development outlines four distinct stages that characterize the progression of cognitive abilities in individuals, particularly during childhood. These stages provide a framework for understanding how children acquire knowledge and make sense of the world. The following section delineates each of Piaget's four stages, highlighting key characteristics and cognitive milestones associated with each developmental phase.

Piaget's theory outlines four stages of cognitive development: Sensorimotor (Birth to 2 years), Preoperational (2 to 7 years), Concrete Operational (7 to 11 years), and Formal Operational (11 years and beyond). These stages mark progressions in understanding from sensory experiences to abstract thinking. Key concepts include object permanence, language

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acquisition, logical thinking, and hypothetical reasoning. Assimilation and accommodation are discussed as processes for integrating new information into existing cognitive structures.

Art experience in different age groups

Art has the remarkable ability to transcend age boundaries, serving as a universal language that allows individuals to express themselves uniquely. This research delves into the personal and subjective experiences individuals have with art.

The cognitive advancements associated with the concrete operational stage have profound implications for children's engagement with art. As children transition into this stage, they gain the cognitive capacity to represent their thoughts and perceptions with increased complexity and nuance through artistic expression. The newfound logical thinking allows them to plan, organize, and execute artistic endeavors with a greater understanding of spatial relationships, symbolism, and composition. Piaget emphasized the importance of symbolic representation as a cognitive skill acquired during the concrete operational stage. In the context of art, this skill manifests in children's ability to use symbols, imagery, and visual metaphors to convey abstract ideas and emotions. The artwork becomes a symbolic language through which children externalize their evolving thoughts, experiences, and feelings. Another aspect of Piaget's theory relevant to art exploration is the development of perspective-taking. As children progress through the concrete operational stage, they become more adept at adopting different viewpoints and considering multiple aspects of a situation. This cognitive flexibility is mirrored in their artistic creations, where they may experiment with different perspectives, styles, and artistic techniques. Piaget's theory underscores the importance of providing opportunities for children to actively engage in their learning processes. In the realm of art, this translates to creating an environment that empowers self-expression and creativity. Art becomes a medium through which

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children not only externalize their cognitive developments but also exercise agency in shaping their unique artistic identities.

Children's engagement with art undergoes significant changes across development (Berlyne, 1971). In early childhood, children are drawn to art for its sensory and emotional qualities, often focusing on bright colors, bold shapes, and pleasing textures (Cohen, 2002). As they mature, children begin to develop a deeper understanding of art's symbolic and communicative power, appreciating the ability of art to represent the world in both literal and figurative ways (Winner, 1982). At the same time, children's cognitive abilities develop, allowing them to engage in more complex forms of art making, such as storytelling and exploring abstract concepts (Wilson, 1998).

Current Study

The current study delves into the multifaceted dimensions of artistic encounters, exploring how individuals across different age groups make sense of and engage with artworks that hold personal significance. By examining the cognitive, emotional, and aesthetic aspects of these experiences, we aim to gain insights into the developmental trajectory of art appreciation and the impact of personal narratives on our interactions with art. The study takes art as the recursive process in which human beings make sense of the world and reflect on their experiences with an artwork by examining the multiple layers involved in the semiotic sense-making of art. The first layer encompasses the aesthetic and sensorial experiences, the second layer involves learned behaviors and the third layer delves into the semiotic sense-making itself, which can be further divided into the first-order analysis of an artifact's qualities and the second-order analysis that views the artwork as a tool for understanding life

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(Van Heusden, 2010, 2011, 2016). This study uses CODA analysis and the Geneva Emotion Wheel to assess the cognitive and emotional dimensions of artistic experiences respectively.

We hypothesize that age related to Piaget developmental stages will influence individuals' emotional responses to significant artworks, with children in the concrete operational stage tending to exhibit more intense and immediate emotional reactions compared to children in the formal operational stage. We also expect the children in the formal operational stage to elicit more complex emotions as read on the GEW. Additionally, we expect that the chosen medium will play a significant role in shaping the complexity of emotions evoked, with artworks that resonate with personal experiences potentially eliciting more intense and complex emotions than those that lack such connections. Furthermore, we anticipate that the influence of personal narratives and life experiences will be particularly pronounced for younger participants, as their understanding and interpretation of artworks are often deeply intertwined with their personal experiences and worldviews. On the other hand, older participants may exhibit a greater ability to detach from personal narratives and engage with artworks on a more abstract and intellectual level.

Research Questions and Hypotheses

Can the observation of children's sense making process in relation to arts provide insights into their cognitive development and artistic expression?

How does children's art experience change across Piaget's four stages of cognitive development (sensorimotor, preoperational, concrete operational, and formal operational)?

How are emotions towards artworks distributed across different age groups? Do children further along in piaget developmental stages get more complex emotions?

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This research hypothesizes that across Piagetian stages of development more cognitively focussed art experiences will be found, more complex emotions will be found on the GEW and that more imaginative/artistic experiences will be found through CODA analysis.

Three secondary research questions will be researched, but will not be part of the main article. You can find the results in Appendix A.

Does children's meaning-making in art move from more emotionally focused to more cognitively focused across development?

To what extent do children's art experiences in different Piagetian stages reflect an emphasis on craft, aesthetics and artistic expression?

These questions will not be a part of the main text of this research, but some results on these will be included in the appendix.

Method

Participants

Our recruitment efforts yielded a total of 352 participants, evenly distributed across seven age groups: (1) 4-6 years, (2) 7-9 years, (3) 10-12 years, (4) 13-15 years, (5) 16-19 years, (6) 20-34 years, and (7) 35-59 years. Each age group consisted of 22 dyads, each comprising an individual participant and a project buddy (PB). These PBs served as supportive listeners and partners throughout the study, fostering a sense of comfort and rapport that encouraged genuine and candid responses. To ensure effective communication, PBs and participants shared the same language. To further enrich our sample, we included 11 additional dyads at special education schools in groups 1-3.

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Our recruitment strategy employed a multi-pronged approach: We leveraged our established network within the Openbaar Onderwijs Groningen (OOG), partnering with schools to integrate the study procedure into their art education curricula. Teachers who had participated in our previous research project on cultural education were informed about the study and provided with materials to inform parents. Parents were then invited to provide consent for their children's participation. During school hours, participants engaged in the study at the designated school location. Participating teachers received €10 per participating pupil to support additional cultural activities, while pupils received certificates documenting their involvement.

Beyond schools, we harnessed the power of social media platforms such as Facebook, Instagram, LinkedIn, and Twitter to reach a broader audience across all age groups. To specifically target the young adult demographic (group 5), we utilized targeted advertising via research panel websites. Additionally, we strategically placed flyers and brochures at various leisure, cultural, and education centers to attract participants from diverse educational backgrounds.

To incentivize participation, we offered three compensation options. Participants registering through the SONA system were rewarded with SONA credits, beneficial for certain courses in their studies. Alternatively, participants could opt for a €10 Pimm voucher. For those recruited through schools and selecting the donation option, a €10 donation was contributed to the respective school. This donation was allocated towards supporting additional cultural activities for the participating classes. Additionally, all participants received certificates documenting their participation, which could be included in their school portfolios to showcase their involvement in cultural activities.

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For participants recruited through schools and opting for the donation option, the school received €10 per participating pupil. Schools were encouraged to utilize these funds to support additional cultural activities for the participating classes. Participants also received certificates documenting their participation, which could be added to their school portfolio for cultural activities.

Design & Procedure

The present study aimed to investigate the subjective experiences of individuals when engaging with personally meaningful items (PMIs) both individually and in the context of dyadic interactions. To achieve this objective, we employed a mixed-methods approach, combining self-report questionnaires and video-recorded dyadic interactions. Prior to the experimental phase, participants were recruited through flyers, social media, and word-of-mouth. They were asked to invite a peer to co-participate in the study. Each participant was then instructed to choose and bring one PMI, which could be a painting, sculpture, photograph, song, poem, piece of writing, or any other item that held personal significance for them. Participants were asked not to share their PMI choices with their co-participants prior to the experiment. After their registration for the study, participants received a referral guide, which provided instructions on how to choose their PMI, as well as a space to reflect on the reasons behind their choice. Parents and caretakers were also provided with the referral guide to assist children in understanding the importance of their PMI selection. The experimental phase took place at the laboratory of the Ambulatory of the University of Groningen, at collaborating schools, or at participants' homes. The informed consent was given prior to this and was done through qualtrics before the participants partook in the study.

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Participants were randomly assigned to either allocation group 1 or allocation group 2. In allocation group 1, participants engaged with their own PMI first, followed by their co-participant's PMI. In allocation group 2, the order was reversed.

For each PMI, participants were given a designated area with video recording facilities and asked to interact with the item for at least 10 seconds and a maximum of 2.5 minutes. They were encouraged to engage with the PMI using all available senses, such as looking at, listening to, watching, or even manipulating it.

After engaging with both PMIs individually, participants were brought together in front of each other wearing microphones. They were instructed to engage in a semi-structured conversation about their PMIs, using open-ended questions provided by the researchers. Conversation prompts were available for participants to utilize as needed. The dyadic interaction was video-recorded from multiple angles using two regular cameras and two Azure Kinect DK depth camera cameras.

Following the dyadic interaction, participants completed post-questionnaires for both PMIs. These questionnaires included measures of bodily sensations, emotions, preferred semiotic strategies, general preferences for media use, Openness to Experience, and depression and anxiety for participants over 18 years of age. Additionally, participants provided demographic information such as age, sex, relationship with their co-participant, and gender (for participants over 12 years of age). Femininity and masculinity were assessed using a short form of the Personality Attributes Questionnaire (PAQ-8) developed by Spence et al. (1978).

The Geneva Emotion Wheel (GEW) data were analyzed using descriptive statistics and thematic analysis to identify patterns of emotional expression. The preference for semiotic strategies questionnaire was analyzed using descriptive statistics to identify participants'

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preferred modes of engagement with PMIs. The questionnaires on media use, Openness to Experience, depression and anxiety, and demographic information were analyzed using descriptive statistics and correlational analyses to examine relationships between PMI engagement and other factors.

Data Collection

Data was collected through a two-phase process: a preparation phase and an experimental phase. Participants were invited to bring a significant item (SI) to the experiment, which could be anything that had personal meaning to them. Participants were then randomly allocated to either allocation group 1, in which they engaged with their own SI first, or allocation group 2, in which they engaged with the item brought by the person co-participating with them first.

Preparation Phase:

Participants were instructed to select a peer (friend, family member, or colleague) to join the experiment. They were tasked with bringing one significant item (SI) to the experiment. A referral guide was provided to assist participants in choosing their SI and preparing for the experiment.

Experimental Phase:

Participants engaged with their own SI individually for 2.5 minutes. They completed questionnaires regarding their SI, including the Geneva Emotion Wheel and a brief questionnaire on preferred semiotic strategies. Participants then engaged with the SI brought by their co-participant for 2.5 minutes. Questionnaires regarding the co-participant's SI were also completed. A semi-structured conversation about the SIs ensued and lastly, participants answered questionnaires regarding general media preferences, personality traits (Openness to Experience), and demographic information.

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For the Geneva Emotion Wheel, descriptive statistics and Wilcoxon signed-rank tests were utilized to compare emotions experienced with participants' own SIs versus those brought by co-participants. Similarly, short questionnaires underwent analysis using descriptive statistics and t-tests for comparison. Conversations were analyzed employing Cognitive Discourse Analysis.

To analyze the participants' sense-making process, we will code the media they discuss in terms of the category (body, artifact, language, graphic signs), the engagement type (productive/receptive), and the strategies they employ (perception, imagination, conceptualisation, and analysis). This coding will be based on Van Heusden's (2015) framework for understanding sense-making through semiotics.

The Geneva Emotion Wheel: Measuring Emotional Responses to Art.

Since emotions play a crucial role in shaping our experiences and understanding of art, assessing emotional responses to art pieces is essential for comprehending the connection between art and human perception. The Geneva Emotion Wheel (GEW) emerges as a valuable tool for this purpose, providing a structured and comprehensive framework for categorizing and analyzing emotions experienced in response to art. Developed by Scherer et al. (2018), the GEW offers researchers a multidimensional instrument to investigate and understand emotions in various contexts.

The GEW employs a forced-choice response format, allowing participants to select the emotions they feel most closely correspond to their experience with a particular artwork. The wheel is organized around two primary dimensions: arousal and valence. arousal refers to the perceived ability to influence the situation, with high arousal indicating a sense of agency and

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low arousal suggesting a feeling of helplessness. Valence represents the polarity of the emotion, with high valence signifying pleasantness and low valence indicating unpleasantness.

The intersection of these dimensions creates eight basic emotions: joy, happiness, sadness, disgust, anger, fear, surprise, and anticipation. These basic emotions serve as building blocks for more complex emotions, which arise from the combination of two or more basic emotions in different valence and arousal quadrants.

To assess the intensity of emotions experienced, the GEW employs concentric circles, with the innermost circle representing the least intense emotion and the outermost circle representing the most intense. This allows participants to provide a nuanced understanding of their emotional reactions.

In the present study, the GEW was used to compare the emotional responses of children and adults to their own selected artworks. Important to note for the GEW is that participants were able to fill in two emotions per selected artwork in the survey. They could also fill in 'other' or 'no emotion'. In the case that a participant reported 'other' they could describe their emotion in a textbox.

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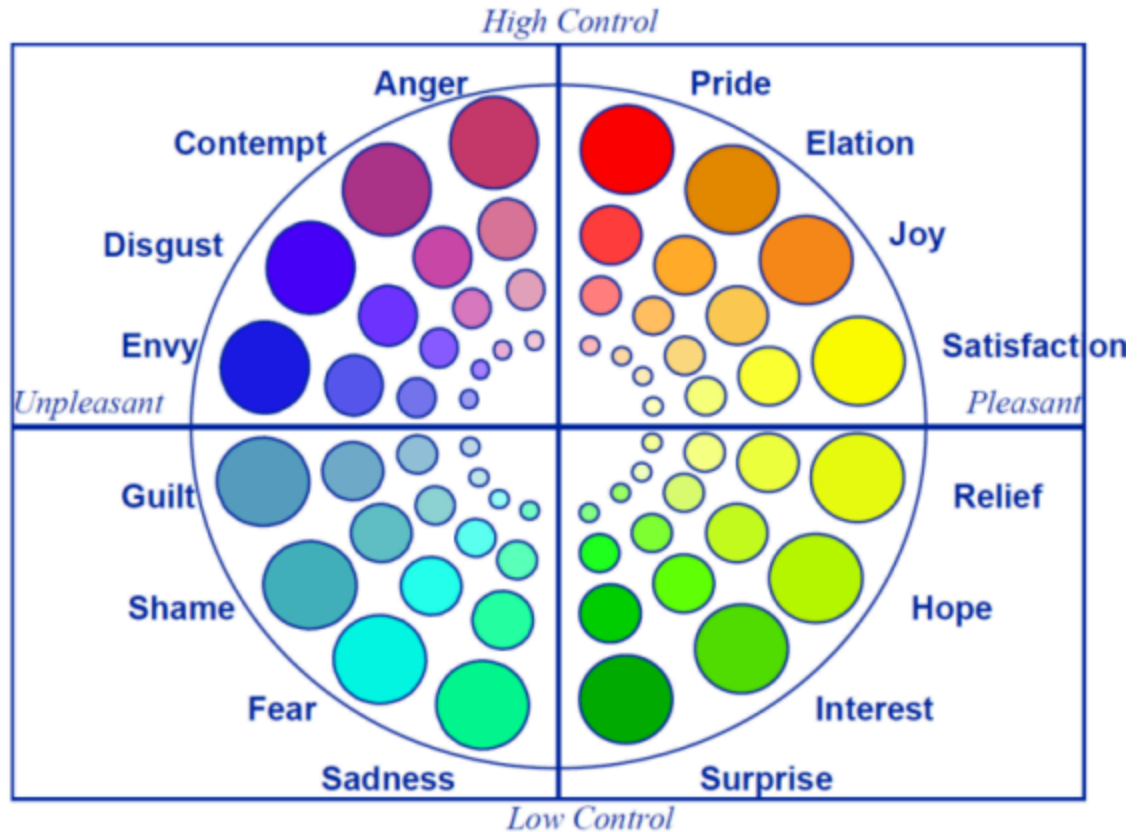


Image 1. The Geneva Emotion Wheel

Exploring Emotional Responses to Arts in General Through Cognitive Discourse Analysis

Emotional responses to art are a complex and multifaceted aspect of the human experience. While the focus of emotional responses to art usually centers on visual arts such as paintings, sculptures, and photographs, the experience extends to other forms of art as well, including music, theater, literature, dance, and film. All of these forms of art evoke different emotions that allow individuals to connect with the work of art itself. This paper will use Cognitive Discourse Analysis (CODA) to identify and analyze the emotional responses to arts in general.

CODA is a methodology that employs natural language processing techniques to analyze the way individuals use structures and patterns in their language to capture insights into

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high-level cognitive processes (Taylor & Tenbrink, 2013). The analysis of the language used by participants reveals patterns and themes in their descriptions of their emotional responses to art. These patterns can then be used to identify the different types of emotional responses that individuals experience when engaging with different forms of art. In this study, the participants were asked to bring an artwork or object which is significant to them. This object/artwork could have been anything from a painting to a photograph to a piece of music. They then talked about their experiences with these artworks which the researchers have transcribed and these were analyzed using CODA.

CODA consists of four steps: transcription, segmentation, annotation, and an inter-rater reliability check. Each step is briefly discussed in Appendix A.

The CODA analysis of emotional responses to art reveals three main categories:

Type of Response	Description	Examples
Aesthetic/Conceptual	Focuses on the perception of formal features and patterns of the art	"I enjoyed the colors and textures in this painting." "The musician's technique was impeccable." "The piece was well-composed and balanced."
Craft/Analytical	Focuses on the first-order of semiosis, making sense of the experience in terms of the work's quality and how it was	"The artist's skill in using light and shadow was impressive." "The musician's interpretation of the piece was

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	made	heartfelt and moving." "The composer's choice of instrumentation was creative and effective."
Artistic/Imaginative	Focuses on the second-order of imaginative semiosis, making sense of life with the artwork	"This painting reminds me of my grandmother's garden." "This piece of music evokes feelings of nostalgia and longing." "I can relate to the themes of this artwork on a personal level."

Table 1: Conceptual categories for CODA annotation with examples.

Results

The current section presents our results. Including transcripts from research conducted with children aged 6 to 11, in which their art experiences and appreciation of personal objects are explored. The study investigates the children's perspectives on their chosen objects, considering aspects such as aesthetic appeal, craftsmanship, imagination, and emotional connections. The objects discussed include handmade items, toys, souvenirs, and artistic creations. The results shed light on the multi-faceted nature of children's art engagement and their engagement with personal artifacts, providing insights into the role of imagination, aesthetics, and personal connections in shaping their artistic experiences.

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Developmental progression in children's art experiences

The literature and our hypotheses suggest a developmental progression in children's art experiences, with an initial emphasis on sentimental value and craft in earlier stages, gradually evolving into a more nuanced appreciation for aesthetics, conceptual elements, and artistic expression in later stages. Support for this hypothesis was partly given. The CODA categories provide insights into how children's cognitive development influences their artistic expression. Younger children (age 6) primarily fall into the 'Aesthetic/Conceptual' category, suggesting an emotionally focused interpretation of art. Children only started to fall into the Craft/Analytical category three years later when they were nine years old. Still a trend can be seen in as children age, they begin to fall into more diverse categories such as Artistic/Imagination and Craft/Analytical. This indicates a shift towards more cognitively informed analyses of art. This suggests a developmental trajectory in the way children derive meaning from artistic experiences.

Emotions in different age groups towards Artworks

Children further along in Piaget's developmental stages exhibit a more complex range of emotions towards artworks. Emotional responses become intertwined with cognitive abilities, reflecting an enhanced understanding of the emotional content and intent behind the art objects. The CODA categories provide insights into how children's cognitive development influences their artistic expression. Younger children primarily fall into the 'Aesthetic/Conceptual' category.

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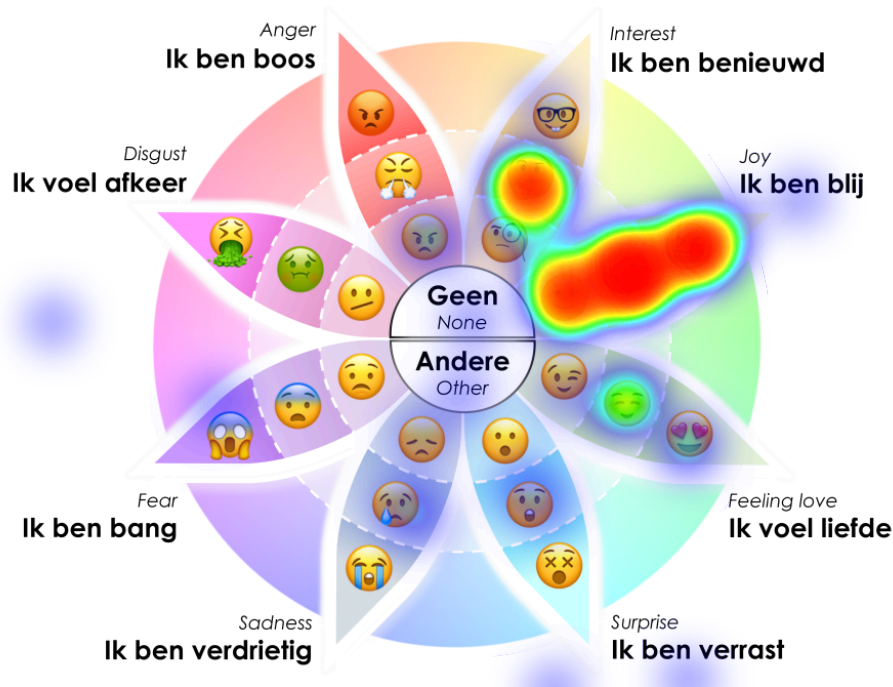


Image 2 heatmap of Geneva Emotion Wheel

As can be seen on image x above. One thing that instantly comes across is that emotions as given by participants on the GEW are mostly in positive valence and high arousal. This effect comes across all age groups in children. Another interesting thing to note is that the emotions are almost all high arousal, with exception of emotions such as fear, surprise and surprise which only show up rarely. The exclusive finding of positive valence and high arousal emotions across all age groups in children, as observed in the GEW, is a significant finding. This could suggest that children's interactions with art are primarily characterized by positive emotional experiences, which may play a crucial role in their cognitive and emotional development. However, as we will later get into this is not by any means. The high arousal associated with these emotions show that children could feel a sense of agency and understanding in their experiences with art. This could be due to the structured nature in which our experiment was done, in which we provided clear guidelines and goals, thereby reducing uncertainty. Interestingly, emotions such as fear and

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surprise, which are typically associated with low arousal, appear very little. This could again be due to the safe and supportive environment of our experiment. Which minimized the likelihood of negative or unexpected experiences. It could also be that, since children were able to select the artworks themselves, they pick out artworks which have a positive effect on their wellbeing. From a developmental perspective, the prevalence of positive and high arousal emotions could encourage a positive attitude towards learning and creativity in children. This, in turn, could enhance their motivation to engage in art activities, thereby promoting cognitive development and artistic expression.

However, it is important to note that this is a preliminary analysis, and further research is needed to fully understand the complex interplay between children's emotional experiences, cognitive development, and artistic expression. Future studies could explore the role of individual differences, the influence of the social and cultural context, and the impact of different types of art activities on children's emotional experiences and cognitive development.

Insights into Cognitive Development and Artistic Expression

When looking at children's sense-making processes in relation to art gives valuable insights into their cognitive development. The progression from emotionally focused art experiences to more cognitively focused art experiences suggests a developmental trajectory in the way children derive meaning from artistic experiences. For the Aesthetic/Conceptual category, which is considered the most emotional, we see a peak at age 9 with 8 instances, but this decreases to 5 and 4 instances at ages 10 and 11 respectively. This suggests that as children grow older, their focus may shift away from the emotional aspects of art. The Craft/Analytical category, which represents a balance between emotional and cognitive interpretation, shows an

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increase from age 9 to 11. This indicates that as children grow older, they may start to incorporate more analytical thinking into their interpretation of art. The Artistic/Imagination category, considered the most cognitive, shows a significant increase from age 8 to 9, with instances rising from 3 to 11. However, there is a decrease at age 10, followed by an increase at age 11. This fluctuation suggests that the transition to a more cognitive interpretation style may not be linear and could be influenced by various factors such as individual differences and environmental influences.

In conclusion, while there is evidence to suggest a general trend towards a more cognitive-focused interpretation style as children get older, the progression is not straightforward and appears to be influenced by a complex interplay of factors. Further research is needed to fully understand this developmental trajectory.

Children's Art Experience across Piaget's Stages.

The data suggests a progression in children's art experiences that aligns with Piaget's four stages of cognitive development. In the sensorimotor stage, children's art experiences were not recorded. However, from the preoperational stage onwards, children began to express emotions such as joy, surprise, and interest in their art experiences. As they transitioned into the concrete operational stage, their emotional responses became more varied, including complex emotions and a mix of positive (e.g., joy, love) and negative emotions (e.g., sadness, fear). By the formal operational stage, children demonstrated an ability to experience multiple emotions simultaneously, indicating a more nuanced understanding and appreciation of art. These results should however be carefully assessed. As our sample of children is quite small and not all results align with our hypotheses based on Piaget's stages of development.

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Insights into Cognitive Development and Artistic Expression

Observing children's sense-making processes in relation to arts provided valuable insights into their cognitive development and artistic expression. It was hypothesized that the complexity of emotions and the types of CODA categories associated with their art experiences appeared to increase with age, suggesting a correlation between cognitive development and artistic expression. However, as stated before emotions reported on the GEW were very similar. With most children selecting high arousal and positive valence emotions. Children who did not report these emotions, still reported consistent non-complex emotions. Meaning that of the two selected emotions, both were in the same dimensions of arousal and valence.

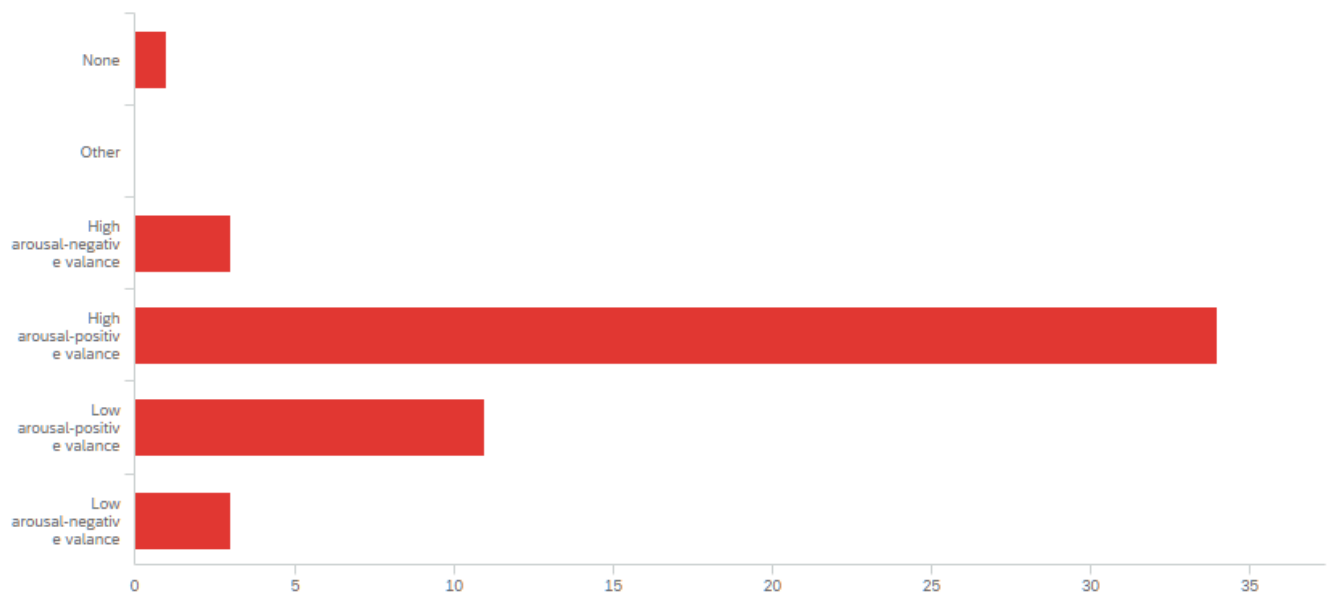


Image 3 distribution arousal and valence

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Discussion

This study provides a beginning of a comprehensive understanding of children's engagement with art and personal artifacts, showing the multifaceted nature of their experiences. The participants' perspectives on the objects they brought with them, which ranged from handmade items to toys and artistic creations, were analyzed using CODA considering aspects such as aesthetic appeal, craftsmanship, imagination, and emotional connections. We also looked at the emotional responses as measured by the GEW.

Implications

This study's results have implications for trying to understand children's artistic experiences and their appreciation of personal objects. The findings underscore the richness of personal connections with cherished items, encapsulating elements of craftsmanship, emotional resonance, and visual aesthetics. This diversity in children's experiences can inform educational practices, particularly in art education, by acknowledging and fostering these varied ways of relating to and deriving meaning from objects.

The study also highlights the developmental differences in children's appreciation of their possessions. Younger children showed a keen interest in the craftsmanship of objects, appreciating the tangible and physical aspects of their possessions. This foundational understanding of the effort put into creating meaningful items can be leveraged in educational settings to foster appreciation for craftsmanship and the value of effort.

Older children also emphasized craftsmanship but with a different, more refined perspective, indicating a maturation in their understanding and appreciation of their possessions. This progression can guide the design of age-appropriate educational interventions that cater to the evolving interests and understandings of children.

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Interestingly, emotions such as fear and surprise appeared minimally. This could be due to the safe and supportive environment in which art activities are usually conducted, minimizing the likelihood of negative or unexpected experiences. It is also likely that, since children were able to select the artworks themselves, they pick out artworks which have a positive effect on their wellbeing. From a developmental perspective, the dominance of positive and high arousal emotions could be about a positive attitude towards learning and creativity in children. This, in turn, could enhance their motivation to engage in art activities, thereby promoting cognitive development and artistic expression.

It was shown that observing children's sense-making processes in relation to art provides insights into their cognitive development. The progression from emotionally focused interpretations to more cognitively informed analyses suggests a developmental trajectory in the way children derive meaning from artistic experiences.

For the Aesthetic/Conceptual category, which is considered the most emotional, we see a peak at age 9 with 8 instances, but this decreases to 5 and 4 instances at ages 10 and 11 respectively. This suggests that as children grow older, their focus may shift away from the emotional aspects of art. When looking at the Craft/Analytical category, which represents a balance between emotional and cognitive interpretation, shows an increase from age 9 to 11. This indicates that as children grow older, they may start to incorporate more analytical thinking into their interpretation of art. Lastly, the Artistic/Imagination category, considered the most cognitive, shows a significant increase from age 8 to 9, with instances rising from 3 to 11. However, there is a decrease at age 10, followed by an increase at age 11. This fluctuation suggests that the transition to a more cognitive interpretation style may not be linear and could be influenced by various factors such as individual differences and environmental influences.

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In conclusion, while there is evidence to suggest a general trend towards a more cognitive-focused interpretation style as children get older, the progression is not straightforward and appears to be influenced by a complex interplay of factors. Further research is needed to fully understand this phenomenon.

Children in the concrete operational stage (7 - 11 years old) become more analytical and conceptual in their art experiences as analyzed through CODA. They are interested in understanding the rules and principles of art, and they enjoy creating their own original artworks. This can be seen in the data below that children past age 8 begin to report more Craft/Analytical responses towards their selected artworks. They also start to report artistic/imaginative responses as measured by CODA. This suggests that children in this stage are not only capable of appreciating the aesthetic aspects of art but are also beginning to understand and apply the rules and principles of art. They start to explore their creativity, leading to the production of original artworks.

Children in the formal operational stage (11 - 15 years old) are at their most complex and sophisticated in their approach to art. They are able to think abstractly and critically about art, which can be partly seen in our data. We get more artistic/imaginative responses as age progresses, however in our data this does not align exactly with Piaget's cognitive development stages. As you can see below the age which produced the most artistic/imaginative responses was age nine. This is two years prior to entering Piaget's formal operational stage. This discrepancy could be attributed to multiple factors. It's a possibility that some children develop certain cognitive abilities earlier than others. Environmental factors, such as exposure to art and art education, could also play a role. The data suggests a progression in children's art experiences that aligns with Piaget's four stages of cognitive development. As they transitioned into the

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concrete operational stage, their emotional responses became more varied, including complex emotions and a mix of positive (e.g., joy, love) and negative emotions (e.g., sadness, fear). By the formal operational stage, children demonstrated an ability to experience multiple emotions simultaneously, indicating a more nuanced understanding and appreciation of art. These results should however be carefully assessed. As our sample of children is quite small and not all results align with our hypotheses based on Piaget's stages of development.

Observing children's sense-making processes in relation to arts provided valuable insights into their cognitive development and artistic expression. It was hypothesized that the complexity of emotions and the types of CODA categories associated with their art experiences appeared to increase with age, suggesting a correlation between cognitive development and artistic expression. However, as stated before emotions reported on the GEW were very similar. With most children selecting high arousal and positive valence emotions. Children who did not report these emotions, still reported consistent non-complex emotions. Meaning that of the two selected emotions, both were in the same dimensions of arousal and valence.

The data suggests a shift in children's meaning-making in art from being more emotionally focused to more cognitively focused across development. Younger children were engaging with art on an emotional level. However, the older children in our research their engagement with art became more cognitively focused, as shown by the emergence of complex emotions and the increasing of imaginative experiences as measured by CODA. This shift from emotionally focused to cognitively focused meaning-making in art is an important finding of this study, and it has significant implications for art education and child development. However, further research is needed to understand this trajectory and what this means. Future studies could explore the role of individual differences, the influence of the social and cultural context, and the

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impact of different types of art activities on children's emotional experiences and cognitive development.

Limitations

While the study provides insights, there are several limitations which should be taken into account. The analysis is based on a specific age group of children (6 to 11 years old), of which the sample size was quite small. Additionally, the study relies on children's self-reported experiences, which may be influenced by recall bias or social desirability bias. Future research could incorporate observational methods or longitudinal designs to gain a more in-depth understanding of children's engagement with art and personal artifacts over time.

Another limitation of our study was the setting in which the experiment was conducted. Especially when doing the experiment in our lab, it was quite a different experience for the children than they would organically have. We also let children select their own artworks, which had its benefits and negative consequences. We had very similar emotional reactions across a lot of the participants. This could be because of letting children select their own artworks.

It is important to note that this is a preliminary analysis, and further research is needed to fully understand the complex interplay between children's emotional experiences, cognitive development, and artistic expression. Future studies could explore the role of individual differences, the influence of the social and cultural context, and the impact of different types of art activities on children's emotional experiences and cognitive development.

It should also be noted that children selecting their own artworks could have had a very large effect on the emotions reported, seeing that almost all the emotions reported were positive. For future research this should be taken into account, especially when wanting to research a diverse range of emotions this could be an issue.

6 Conclusion

In conclusion, this study delves into the intricate world of children's engagement with art and personal artifacts, shedding light on the multifaceted nature of their experiences. The implications of the study underscore the richness of personal connections with cherished items, encompassing craftsmanship, emotional resonance, and visual aesthetics. Examining children in the concrete operational stage (7-11 years old) reveals a shift towards more analytical and conceptual engagement with art. As children enter the formal operational stage (11-15 years old), their approach becomes even more complex and sophisticated, aligning with Piaget's cognitive development stages but showing some discrepancies, possibly due to individual differences and environmental factors.

In essence, while providing valuable insights, this study serves as a starting point for a deeper understanding of the intricate relationship between children, art, and personal artifacts. I hope for more exploration into this nuanced subject of emotional experiences, cognitive development, and artistic expression in development.

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References

- Arnheim, R. (1954). *Art and visual perception: A psychology of the creative eye*. London: Faber and Faber.
- Bloom, P., & Markson, L. (1998). Intention and analogy in children's naming of pictorial representations. *Psychological Science*, 9(3), 200.
- Cabbai, Giulia & Kühnapfel, Corinna & Fingerhut, Joerg & Kaltwasser, Laura & Prinz, Jesse & Pelowski, Matthew. (2023). Emotion, Embodiment, and Aesthetic Appraisal: The Impact of Interoceptive Abilities and Art Type. doi:10.31234/osf.io/2dkfx.
- Dissanayake, E. (1992). *Homo aestheticus: Where art comes from and why*. The Free Press.
- Donald, M. (2001). *A mind so rare: The evolution of human consciousness*. W.W. Norton & Company.
- Donald, M. (2006). Art and Cognitive Evolution. In Oxford University Press eBooks (pp.3–20).
- Eisenberg, N., & Mussen, P. H. (1989). *The Roots of Prosocial Behavior in Children*. Cambridge University Press.
- Golomb, C. (2003). Art and the Young: The Many Faces of Representation. *Visual Arts Research*, 29(57), 120–143. <http://www.jstor.org/stable/20716086>
- Gopnik, A. (2016). *The gardener and the carpenter: What the new science of child development tells us about the relationship between parents and children*. Macmillan.
- Hetland, L. (2000). Listening to music enhances spatial-temporal reasoning: Evidence for the "Mozart effect." *Journal of Aesthetic Education*, 34(3/4), 105-148.
- Hood, B. M., & Bloom, P. (2008). Children prefer certain individuals over perfect duplicates. *Cognition*, 106(1), 455–462. <https://doi.org/10.1016/j.cognition.2007.01.012>
- <https://doi.org/10.1093/acprof:oso/9780195306361.003.0001>

HOW DOES ART SHAPE EMOTIONAL PROCESSES THROUGH SENSE-MAKING

Kellogg, R. (1969). *Analyzing Children's Art*. Palo Alto, CA: National Press Books.

Kellogg, R. (1970). Children's Creative Behavior: A Review of Research. *Journal of Genetic Psychology*, 116(1), 67-84.

Pariser, D. (1987). Symbolization and Knowledge in Children's Drawings. In J. J. Wertsch (Ed.), *Culture, Communication, and Cognition: Vygotskian Perspectives* (pp. 294-308).

Cambridge University Press. Piaget, J. (1952). *The Origins of Intelligence in Children*. International Universities Press.

Piaget, J. (1952). *The origins of intelligence in children*. (M. Cook, Trans.). W W Norton & Co.
<https://doi.org/10.1037/11494-000>

Piaget, J. (1952). *The Origins of Intelligence in Children*. International Universities Press.

Piaget, J. (1967). *Six Psychological Studies*. Random House.

Ruskin, J. (1857). *The Elements of Drawing*.

Ten Brink, T. (2014). Cognitive Discourse Analysis: accessing cognitive representations and processes through language data. *Language and Cognition*, 7(1), 98–137.

<https://doi.org/10.1017/langcog.2014.19>

Tenbrink, T. (2020). *Cognitive discourse analysis: An introduction*. Cambridge: Cambridge University Press

Valiz. van Heusden, B. (2015). Arts Education as Culture Education. In S. Schonmann (Ed.), *International Yearbook for Research in Arts Education: Wisdom of the Many: Key Issues in Arts Education* (Vol. 3, pp. 385-388). Waxmann Verlag GmbH.

van Heusden, B., & Gielen, P. (Eds.) (2015). *Arts Education Beyond Art: Teaching Art in Times of Change*. (Antennae). Valiz. <http://valiz.nl/ArtsEducationBeyondArt>

HOW DOES ART SHAPE EMOTIONAL PROCESSES THROUGH SENSE-MAKING

van Heusden, B., Rass, A., & Tans, J. (2016). *Cultuur²: Basis voor cultuuronderwijs*. Koninklijke Van Gorcum.

van Heusden, B. (2015). Arts education 'after the end of art': Towards a new framework for arts education. In B. van Heusden, & P. Gielen (Eds.), *Arts Education Beyond Art: Teaching Art in Times of Change* (pp. 153-168). (Antennae).

van Heusden, B. P. (2010). *De structuur van cultuur, of: wat weet de schildpad?* University of Groningen.

Winner, E., & Gardner, H. (1977). The comprehension of expressive structures: Early and late developments. *Monographs of the Society for Research in Child Development*, 42(5), 1-76.

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Appendix

Below are the research questions removed from the main research, now presented in the appendix:

How do children express analytical assessments and emotional connections with their chosen objects?

What role does craftsmanship play in children's perception of their possessions, and how do they appreciate aesthetic appeal?

How does children's meaning-making in art change across Piaget's stages of cognitive development?

Is there a shift from emotionally focused to cognitively focused meaning-making in children's engagement with art across development?

CODA Analysis

Multiple participants exhibited a tendency for evaluating their objects from a craft or analytical standpoint. This was seen in instances where children delved into the intricate details or practical aspects of their chosen items. In one transcript, one of the children observes: "I notice that the coloring book is still quite empty". This underscores an analytical assessment of the coloring book. Similarly, in another conversation two children provided detailed insights into the construction of a handmade motorbike, showcasing an analytical perspective that appreciated the technical intricacies involved.

Participants oftentimes expressed emotional connections, memories, and imaginative associations with their chosen objects, revealing a strong desire towards the artistic or imaginative. For example, in one conversation a child stated: "Because it helps me when I don't feel so good,". This signifies emotional support coming from the stuffed animal. Additionally,

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another child recounted receiving a stuffed animal from his grandpa who passed away before this child had ever met him, emphasizing the emotional impact of the experience on their imagination.

"Because that's my grandpa, he passed away when I was almost born, so I never got to see him."

(Artistic / Imagination)

Aesthetic appeal emerged as significant themes in participants' discussions about their objects. One child appreciates the aesthetics of a postcard, noting, "I find the card very beautifully made with some watercolor or something."

'And, um, these are all my favorite colors.' (Aesthetic / Conceptual)

The analysis of participants' responses highlights the intricate and multifaceted nature of personal connections with meaningful objects. Whether through analytical assessments, imaginative associations, or aesthetic appreciation, the children showcased diverse ways of relating to and deriving meaning from their chosen possessions.

Transcripts from young children around six years old reveal a keen interest in the craftsmanship of objects, with children appreciating the tangible and physical aspects of their possessions. Craftsmanship is often associated with personal achievements and sentimental values, showcasing a foundational understanding of the effort put into creating meaningful items. For example young children could appreciate the craftsmanship of a guitar, but they put a lot of emphasis on where the guitar was from. In this case it was of a famous guitarist.

Older children continue to emphasize craftsmanship but with a different and more refined perspective. Trophies from competitions and handmade objects serve not only as symbols of

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achievement but also as reflections of attention to detail. Children begin to wonder how things are made, actively questioning this.

'And then I'm also curious about how it was made.' (Craft/Analytical)

Children in the 8-9 age group talk about aesthetic preferences, with discussions on color and overall visual appeal. The aesthetic dimension becomes a crucial factor in their appreciation of personal objects, indicating a growing awareness of visual aesthetics.

'Its green, blue and yellow. But I really like the blue.' (Aesthetic/Conceptual)

'it's quiet and doesn't really bother me. Because if it was bright yellow, I wouldn't really like it.'

Older children extend their aesthetic considerations to emotional significance, indicating a more mature understanding of the interplay between beauty and emotional resonance. Objects become aesthetically valuable not just for their visual appeal but for the emotions they evoke.

'first thing, ever since I was a baby, I have been listening to this composer and..., that I... his music... yeah..., how do I say this? That there are a lot of emotions in his music and that I because of that... that that is why I think it's so beautiful.' (Aesthetic/Conceptual)

The younger age group highlights the role of imagination in play, showcasing the seeds of creativity planted through interactions with objects. Objects like stuffed animals become instruments for imaginative play, hinting at the beginning of creative expression.

(When asked what to do with a stuffed animal) *'Cuddle with it, play with it and talk with it'*

(Imagination/Artistic)

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Older children reveal a more developed understanding of creativity, particularly through objects like LEGO blocks. The ability to construct, create, and imagine is highlighted, showcasing a more sophisticated approach to artistic expression.

'I brought my object because with LEGO, I believe you can do anything. You can create your own world. And you can make whatever you want. And you can be creative... the only limit you have is your creativity.' (Imagination/Artistic)

Shift in Children's Meaning-Making Across Development

Based on the made transcriptions, we can see that children's art experience changes across Piaget's four stages of cognitive development.

Children in the preoperational stage (2 - 7 years old) develop aesthetic and artistic delicacy. They begin to discuss shapes, colors, and patterns, and they enjoy experimenting with different ways to express themselves artistically. This effect was found, as children in this age group in our research did report answers which could be qualified as aesthetic/conceptual. However, our sample only started at six years old, and our sample of children this age was quite small. So it is hard to say anything certain about this group. This will be commented on some more in the limitations section.

Children in the concrete operational stage (7 - 11 years old) become more analytical and conceptual in their approach to art. They are interested in understanding the rules and principles of art, and they enjoy creating their own original artworks. This can be seen in the data below that children past age 8 begin to report more Craft/Analytical responses towards their selected artworks. They also start to report artistic/imaginative responses as measured by CODA. This

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suggests that children in this stage are not only capable of appreciating the aesthetic aspects of art but are also beginning to understand and apply the rules and principles of art. They start to explore their creativity, leading to the production of original artworks.

Children in the formal operational stage (11 - 15 years old) are at their most complex and sophisticated in their approach to art. They are able to think abstractly and critically about art, which can be partly seen in our data. We get more artistic/imaginative responses as age progresses, however in our data this does not align exactly with Piaget's cognitive development stages. As you can see below the age which produced the most artistic/imaginative responses was age nine. This is two years prior to entering Piaget's formal operational stage. Showing that children can already have artistic/imaginative experiences with artworks prior to this stage. This discrepancy could be due to a variety of factors. It's possible that some children develop certain cognitive abilities earlier than others. Environmental factors, such as exposure to art and art education, could also play a role.

Category	Age 6	Age 8	Age 9	Age 10	Age 11	Total
Aesthetic/conceptual	6	2	8	5	4	25
Craft/analytical	0	0	5	1	4	10
Artistic/imagination	0	3	11	1	7	22

Table 2: Distribution of childrens CODA analysis

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Shift from Emotionally Focused to Cognitively Focused Meaning-Making

The data suggests a shift in children's meaning-making in art from being more emotionally focused to more cognitively focused across development. Younger children seemed to engage with art on an emotional level, experiencing simple, intense emotions. However, as they grew older, their engagement with art became more cognitively focused, as evidenced by the emergence of complex emotions and the increased emphasis on craft in their art experiences.

In conclusion, the data provides a compelling look at how children's art experiences evolve across different stages of cognitive development. It emphasizes the interplay between cognitive development, emotional response, and artistic expression, offering valuable insights for educators and researchers in the field of child development and art education. Further research is needed to explore these findings in more depth.

Participant	Age	Emotion 1	Intensity 1	Emotion 2	Intensity 2	CODA Categories
P003	9	Joy	3	Surprise	3	Aesthetic, Craft
P004	9	Joy	2	Interest	2	No content found
P007	9	Joy	2	Love	2	Artistic/Imagination, Aesthetic/Conceptual, Artistic/Imagination
P008	10	Joy	2	Love	2	No results found
P009	10	Joy	1	Interest	2	Artistic/Imagination
P010	11	Joy	2	None	None	Aesthetic/Conceptual
P013	9	Joy	3	Anger	1	No Coda category found
P014	9	Love	3	Joy	1	Artistic/Imagination, Artistic/Imagination
P015	9	Surprised	3	Sadness	1	Artistic/Imagination
P016	9	Interest	3	Surprise	3	Craft/Analytical
P037	6	Fear	3	None	None	Aesthetic/Conceptual

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Table 3

P038	6	Love	2	Interest	1	Aesthetic/Conceptual
P041	8	Sadness	3	Sadness	1	Aesthetic/Conceptual, Artistic/Imagination x3
P042	8	Joy	2	Joy	1	Aesthetic/Conceptual
P053	11	Joy	3	Love	1	Artistic/Imagination, Aesthetic/Conceptual, Craft/Analytical
P054	11	Other	None	None		

childrens age, emotions and CODA categories

Appendix B: Cognitive Discourse Analysis steps.

Transcription: Transcription involves transcribing the participants' written accounts into text. Since the participants' responses were short and did not exceed three sentences, transcription was not necessary.

Segmentation: Segmentation involves dividing the text into smaller fragments based on the study's objectives. In this study, the participants' responses were mostly brief, so segmentation was not necessary for all answers.

Annotation: The annotation process includes two parts. The first part involves defining the content categories into which the responses can be classified. In this study, the categories were based on the different levels of semiotic sense-making (Van Heusden, 2016). CODA was used to categorize the type of experience and its intensity. There were three main categories into which responses could be classified: Aesthetic, Craft, or Artistic. The Aesthetic category is based on the perception of formal features and patterns of the artwork (Van Heusden, 2016). An example of an aesthetic response in art could be: 'I enjoyed the colors and textures in this painting'. Notably, these categories are not mutually exclusive, meaning that a participant's

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response could fall under multiple categories, such as being aesthetic, artistic, and focusing on craftsmanship. These categories can be found in Table 1.

Inter-rater reliability check: The final step in the analysis involved an inter-rater reliability check to ensure that all coders had a similar understanding of the categories and were using them consistently. In this study, there was only one coder, and since he was trained based on formatted rules, a reliability check was not necessary. However, it is important to note that this decision does pose a limitation to the study.