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Manifestations of Theory of Mind (ToM) in Primary School Students During Art Appreciation Sessions
Manifestations de la théorie de l'esprit chez des étudiants du primaire lors de séances d'appréciation de l'art

Pedro Mendonça and Julie Mayrand

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Article abstract

Theory of Mind (ToM) is the cognitive ability to understand one's own and others' mental states, recognizing that others have unique beliefs and perspectives. This study uniquely integrates Visual Thinking Strategies (VTS) with ToM development, offering a novel approach to understanding how art appreciation can enhance cognitive and socio-emotional skills in primary school students. By examining both cognitive and affective dimensions of ToM across diverse socio-cultural contexts, this research provides a comprehensive analysis that bridges gaps in existing literature on art education and cognitive development. The findings have significant practical implications, suggesting that incorporating VTS into the curriculum can foster empathy, perspective-taking, and critical thinking, thereby contributing to a more inclusive and supportive classroom environment.

Manifestations of Theory of Mind (ToM) in Primary School Students During Art Appreciation Sessions

Pedro Mendonça, Université du Québec en Abitibi-Témiscamingue
pedro.mendonca@uqat.ca

Julie Mayrand, Université du Québec en Abitibi-Témiscamingue
julie.mayrand@uqat.ca

Abstract: Theory of Mind (ToM) is the cognitive ability to understand one's own and others' mental states, recognizing that others have unique beliefs and perspectives. This study uniquely integrates Visual Thinking Strategies (VTS) with ToM development, offering a novel approach to understanding how art appreciation can enhance cognitive and socio-emotional skills in primary school students. By examining both cognitive and affective dimensions of ToM across diverse socio-cultural contexts, this research provides a comprehensive analysis that bridges gaps in existing literature on art education and cognitive development. The findings have significant practical implications, suggesting that incorporating VTS into the curriculum can foster empathy, perspective-taking, and critical thinking, thereby contributing to a more inclusive and supportive classroom environment.

Keywords: Art Appreciation; Visual Thinking Strategies (VTS); Aesthetic Experiences; Cognitive Efficiency; Empathy; Imagination; Theory of Mind (ToM); Social and Emotional Learning.

Theory of Mind (ToM)

TTheory of Mind (ToM) is defined as the capacity to recognize and interpret one's own mental states, as well as those of others. It involves understanding that others may hold beliefs, perspectives, intentions, and desires that diverge from one's own. ToM encompasses a variety of abilities such as perspective-taking, decoding emotional expressions, and engaging in cognitive empathy, which is critical for interpreting social cues (Baron-Cohen, 2003; Bensalah et al., 2015; Dvash & Shamay-Tsoory, 2014). ToM is multidimensional, comprising both cognitive and affective components (Baron-Cohen, 2003; Hynes et al., 2005).

Cognitive ToM refers to the ability to understand and infer the thoughts, beliefs, and intentions of others. For example, a child demonstrating cognitive ToM might say, "I think she is sad because she lost her toy," showing an understanding of the other person's mental state.

Affective ToM involves recognizing and responding to the emotions of others. For instance, a child displaying affective ToM might say, "He looks happy because he is smiling," indicating an awareness of the other person's emotional state.

In primary school-aged children, ToM evolves progressively, transitioning from affective to cognitive stages and from intrapersonal to interpersonal dimensions (Dvash & Shamay-Tsoory, 2014; Westby & Robinson, 2014).

Intrapersonal ToM refers to the ability to understand and reflect on one's own mental states. An example of intrapersonal ToM is a child thinking, "I feel nervous about the test tomorrow," which shows self-awareness of their own emotions.

Interpersonal ToM involves understanding the mental states of others in social interactions. For example, a child demonstrating interpersonal ToM might say, "She is upset because her friend didn't share the toy," showing an understanding of the social dynamics and emotions involved.

ToM development is not linear, as factors such as family dynamics, sibling interactions, and the quality of social interactions significantly influence the process (Arranz et al., 2001). Additionally, neurodiversity, cultural differences, and socio-economic status are important factors that can affect ToM development (Adams et al., 2010). Adverse circumstances like family violence, social difficulties, or health issues, can also affect the development of cognitive and ToM-related abilities. It is important to note that diversity, not just adverse circumstances, plays a role in ToM development.

As children mature, they become more adept at integrating social norms and rationalizing their judgments, transitioning from a primarily emotional and intuitive approach to a more rational and complex one. ToM contributes to this maturation by facilitating socialization and perspective-taking, skills that are integral to forming aesthetic judgments.

Leder and Nadal (2014) outline three core components that define an aesthetic experience: the evaluative dimension, the phenomenological (or affective) dimension, and the semantic dimension (Bergeron & Lopes, 2012; Shusterman, 1997):

- **Evaluative Dimension**: This involves the assessment and judgment of the aesthetic value of an artwork. For example, a student might evaluate a painting as beautiful or thought-provoking.
- **Phenomenological (Affective) Dimension**: This refers to the emotional and sensory experiences elicited by an artwork. For instance, a student might feel joy or sadness when viewing a particular piece of art.
- **Semantic Dimension**: This involves the meaning and interpretation of the artwork. For example, a student might interpret a painting as representing freedom or struggle

These components collectively shape the aesthetic character of an experience. The semantic dimension has been linked to empathic responses during aesthetic engagement (Savazzi et al., 2016; Freedberg & Gallese, 2007). ToM plays a pivotal role in these experiences, as individuals often attempt to adopt the artist's perspective to better interpret and assess the artwork.

In educational contexts, children developing ToM abilities facilitate aesthetic judgment by enabling them to recognize the intentions behind a work of art. Furthermore, ToM becomes especially salient during collective appreciation exercises, wherein students share and contrast their interpretations of artworks. This shared attention (Broadbent, 1958) encourages children to explore and evaluate multiple perspectives, further developing their cognitive empathy and interpretative skills.

Empirical research underscores the strong relationship between ToM, creativity, and aesthetic experiences (Guariglia et al., 2015; Craig & Baron-Cohen, 1999). Studies

indicate that individuals with a well-developed ToM exhibit greater receptivity to art, which in turn enhances their aesthetic experiences. Additionally, creativity—strongly linked to ToM—plays a critical role in shaping these experiences (Freedberg & Gallese, 2007; Guariglia et al., 2015; Menninghaus et al., 2017).

Promoting activities that foster ToM, particularly in aesthetic contexts, may have broader educational and social benefits. Research consistently demonstrates a significant correlation between ToM and language acquisition (Blijd-Hoogewys & van Geert, 2017; Lockl et al., 2017). Enhancing ToM can lead to improved language skills, better social interactions, and reduced aggressive behaviors in school environments (Weimer et al., 2017). For example, students with well-developed ToM are better equipped to understand and empathize with their peers, leading to a more inclusive and supportive classroom environment.

Aesthetic Experience, Imagination, and ToM

An aesthetic experience refers to the psychological or physiological reactions to stimuli that are perceived as beautiful or distasteful, while aesthetic judgment involves the contemplation and evaluation of objects or events through sensory perception. During this process, empathy plays a key role as observers attempt to understand and share the emotional experiences depicted in artworks. In the case of art appreciation, the observer often attempts to step into the artist's perspective, which is an exercise in decoding and empathizing with the emotional states of others (Dvash & Shamay-Tsoory, 2014).
At the dawn of the 20th century, art historian Worringer (1908) conceptualized art as a medium that invokes empathy. He argued that aesthetic pleasure stems from empathy, which forges a connection between the observer and the sensual object. Worringer described this connection as the ability to immerse oneself in a foreign object, experiencing it vicariously. This idea serves as the foundation for linking empathy and aesthetic experience.

Recent research further highlights the connection between imagination and ToM during aesthetic experiences, particularly in the appreciation of visual art (Bullot & Reber, 2013; Mendonça, 2020; Mendonça et al. 2019). Observers, especially young ones, use ToM to attribute mental states, beliefs, and desires to fictional characters within artworks. Additionally, they recognize that these works were created with intention, and they actively attempt to interpret this intention (Pellowski & Akiba, 2011; Parsons, 1987). This raises the central research question of our study: how does ToM manifest itself during the appreciation of artworks by primary school students?

Visual Thinking Strategies (VTS)

Visual Thinking Strategies (VTS) is an art appreciation method designed to engage observers in the interpretation of visual artworks. Developed by Housen and Yenawine (2002) for use in museums, VTS encourages participants to engage their perception, interpretation, and expression through guided discussion. A facilitator leads the process by asking a series of open-ended questions, paraphrasing participants' responses, and guiding the dialogue without asserting authority over the interpretation.

VTS is a powerful educational tool, fostering communication and visual literacy-critical thinking skills that are essential for interpreting visual reality. The method proceeds in stages: first, the facilitator presents an artwork and instructs students to

observe it for a minute in silence. After this observation phase, the facilitator asks VTS open-ended questions (What's going on in this picture? What make you say that? What more can you say?), listens carefully to students' interpretations, and connects differing views, allowing students to guide the conversation.

Research suggests that VTS promotes the development of socio-emotional skills related to ToM. Van Leeuwen et al. (2023) demonstrated that VTS enhances participants' socio-emotional engagement with artworks, while Sinquefield-Kangas (2023) found that VTS exercises stimulate empathic behaviors as students revise their initial assumptions based on peer input.

Through VTS, students not only develop their aesthetic judgment but also learn to engage in empathetic and interpretive thinking, essential components of ToM. This connection between aesthetic appreciation and the development of cognitive and affective ToM provides insight into how art education can enhance social and emotional skills in young students.

The Experiment

Recruitment for this study was conducted through convenience sampling and publicity, facilitated by school administrators. Two schools in Sherbrooke, Quebec, were selected for their willingness to participate and their diverse student populations. Three classes from these schools were chosen to ensure a representative sample of primary school students. The selection of these specific schools and classes was based on their accessibility and the administrators' support for the study.

A total of 82 French-speaking students aged 7 to 11, from the second and third elementary cycles, participated in the study. Among them, 50 were female and 32 were male. The VTS protocol was implemented in these three classrooms, with nine VTS lessons administered across the classrooms. Each classroom had one teacher who facilitated the sessions, and the teachers were provided with training on the VTS method prior to the study.

During the research sessions, the primary researcher and one research assistant were present in the room. The primary researcher was responsible for overseeing the implementation of the VTS protocol and ensuring that the sessions adhered to the study's guidelines. The research assistant assisted with logistical tasks, such as setting up the audio recording equipment. The classroom teacher played a crucial role in facilitating the VTS discussions, guiding the students through the observation and interpretation phases without asserting authority over their interpretations.

The VTS sessions focused on 27 artworks selected for their figurative and narrative elements. The selection of artworks was guided by the VTS method, which emphasizes figurative pieces with accessible narratives. To adapt the selection to the cultural context of Quebec, several artworks from Quebec school curriculum were incorporated. This selection process was validated by a jury of specialists prior to implementation in the study.

Each VTS session was recorded using ceiling-mounted microphones to capture students' comments and interactions. The transcriptions were subsequently analyzed according to conceptual categories associated with ToM, focusing on the students' ability to engage in cognitive and affective perspective-taking during art appreciation exercises.

Rationale for Data Collection Instruments

Audio recordings were chosen as the primary data collection instrument for several reasons. First, audio recordings allow for the capture of verbal interactions and discussions in their entirety, providing a rich source of qualitative data. This is particularly important for analyzing the nuances of students' verbal expressions and their engagement with the artworks. Additionally, audio recordings are less intrusive than video recordings, which can make students self-conscious and potentially alter their natural behavior. While video recordings and observational notes could provide more detailed data on body language and facial expressions, the decision to use audio recordings was made to minimize intrusiveness and ensure a comfortable environment for the students.

Sociodemographic

Table 1 provides socio-demographic data. Some elements of data were missing in forms (no response to item), as two participants consent forms were present in the envelope, but no socio-demographic form was filled out. Table 1 presents the socio-demographic characteristics of the 84 participants involved in the study.

Table 1

Socio-demographic characteristics of study participants (n = 84)

Characteristics	**Participants (n = 84)**
Spoken language at home	French 81 Other 1
Parent age	40.14
Student age	8.89
Student sex	M 32 F 50
Responding adult	Father 16 Mother 65
Parent schooling	College 31 College 24 University 27
Job type (responding parent)	Full time 67 Part time 2 No job 12
Revenue	$118,653

Most participants (81) speak French at home, with only one participant speaking another language. The average age of parents is 40.14 years, while the average age of the students is 8.89 years. The student group consists of 32 males and 50 females. Most responding adults are mothers (65), with fathers making up the remaining 16. Regarding parent education, 31 parents have college education, 24 have some college education, and

27 have university degrees. In terms of employment, 67 parents work full-time, 2 work part-time, and 12 are unemployed. The average household income is $118,653.

Data Processing

The collected data were transcribed and categorized based on Theory of Mind (ToM) frameworks. The process involved the following steps:

1. **Transcription and Categorization**:
    - Data were transcribed from audio recordings of VTS sessions.
    - Transcriptions were categorized according to ToM-related concepts.

2. **Cognitive ToM Assessment**:
    - **Definition**: Cognitive ToM involves understanding others' mental states, such as intentions, beliefs, and perspectives.
    - **Levels**:
        - **Interpersonal Level 0**: Basic reflections without deeper meaning.
        - **Interpersonal Level 1**: Reflections involving connections or analogies to interpret the artwork.

3. **Affective ToM Assessment**:
    - **Definition**: Affective ToM involves emotional reactions to others' emotions depicted in the artwork.
    - **Characteristics**: Emotional resonance and identification with characters, often passive and involuntary (Dvash & Shamay-Tsoory, 2014).

Coding Framework

The coding framework used in this study was based on established Theory of Mind (ToM) frameworks, and included the following dimensions:

1. **Cognitive ToM**:
    - **Interpersonal Level 0**: Basic reflections without deeper meaning.
    - **Interpersonal Level 1**: Reflections involving connections or analogies to interpret the artwork.
    - **Intrapersonal**: Understanding one's own mental states.

2. **Affective ToM**:
    - **Interpersonal**: Emotional reactions to others' emotions depicted in the artwork.
    - **Intrapersonal**: Emotional resonance and identification with characters.

These dimensions were examined to extract student responses relating to empathic abilities (Dvash & Shamay-Tsoory, 2014; Westby & Robinson, 2014).

The Results

The collected data comprised a total of 119,967 words exchanged between facilitators and students during the appreciation of 27 artworks across nine sessions. Of

these, 9,992 words were coded as related to ToM concepts, representing approximately 75% of the verbal exchanges. The findings of this study are further elucidated by the data presented in Tables 2 and 3. Table 2: Breakdown of Coded References for Theory of Mind (ToM) Concepts During Art Appreciation Sessions details the number of references (codes), coded words, and images associated with different dimensions of ToM observed during the VTS sessions. This table highlights the prominence of Cognitive Interpersonal ToM (Level 1) and Affective Interpersonal ToM in students' discussions, indicating their engagement in perspective-taking and emotional resonance with the artworks.

Table 2

Breakdown of Coded References

Concept of ToM	Number of References (Codes)	Number of Coded Words	Number of Images Affected
Affective Interpersonal	154	2,092	27
Affective Intrapersonal	3	102	3
Cognitive Interpersonal (Level 0)	110	1,525	24
Cognitive Interpersonal (Level 1)	181	5,269	25
Cognitive Intrapersonal	1	4	1

The data reveal that Cognitive Interpersonal ToM (Level 1) received the highest number of codes (181), followed by Affective Interpersonal ToM (154) and Cognitive Interpersonal ToM (Level 0) (110). Intrapersonal ToM, both cognitive and affective, received the fewest codes, suggesting that these dimensions are less prominent in the art appreciation activities of primary school students.

Examples for each dimension of ToM (Theory of Mind)

The following statements provide examples drawn from the analyzed data and their connection to the targeted concepts. The quotes from participants are drawn from VTS sessions conducted in classroom settings, each focusing on different artworks. A vignette of the appreciated image is provided for each quote. Appendix A offers a comprehensive listing of all artworks used in our experiment.

<u>Interpersonal affective</u>

Lesson 1, Image 1: "*I feel like it's kind of sad*."

Children of the Sea, Jozef Israels,1863

Lesson 2, Image 1: "*I think there are children having fun…*"

Snap the Whip, Winslow Homer, 1872

Lesson 6, Image 1: "*Because of the coats. The little girl, she looks sad, I think*."

Girl with Polio, Rivington Street, Walter Rosenblum, 1938

Lesson 9, Image 3: "*Well, I don't agree with Éliane that they're unhappy. I think they're more chill*."

Negro Boys on Easter Morning. Southside, Chicago, Illinois, Russell Lee, 1941

Intrapersonal affective

Lesson 6, Image 2: "*I think it's a little cold. It's darker at the back, and it feels kind of mysterious. And one of the doll-like figures, the one dressed in dark blue, is scary*."
Lesson 6, Image 2: "*Well, it's like, it looks kind of dusty, and the characters are, I don't know, strange. One of them is scary. They all have very, very pale skin*."

Las Meninas, Diego Rodriguez Velázquez, 1956

Lesson 9, Image 2: "*It looks like the lady is controlled by a spirit because she has a really long neck and is scary*."

July 7, Frederick Jones, 1958

Interpersonal cognitive level 0

Lesson 1, Image 1: "*She looks like she's not as close as if they were real children*."

Children of the Sea, Jozef Israels,1863

Lesson 3, Image 1: "*Well, I think the big one is the mother, and the other is the child, and she's sitting on a chair feeding her*."

The Sick Child, Gabriel Metsu, 1660

Lesson 7, Image 3: "*But I think they were in a contest, and then the three of them reached the final, and the one with glasses won*."

Cousin Reginald Spells Peloponnesus (Spelling Bee), Norman Rockwell, 1918

Lesson 8, Image 2: "*And, I think with the painting, like, yes, she's drawing a bird. Then, after that, she grabs her magnifying glass, puts it over the painting, and then the bird comes out*."

Creation of the Birds, Remedios Varo, 1957

Interpersonal cognitive level 1

Lesson 1, Image 1: "*I think the image, like, yes, it's a family, kind of poor and sad, but like, the [inaudible] of the boat, I don't know, maybe their father could have died on the boat*."

Children of the Sea, Jozef Israels,1863

Lesson 1, Image 2: "*Eh, I think, well, I think it's the grandfather of the little boy, and the grandfather is showing him his job, and he used to work here, maybe. And he was a boat captain. And he's trying to inspire his grandson to…*"

The Stay at Homes (Outward Bound), Norman Rockwell, 1927

Lesson 2, Image 1: "*Well, I say they're playing a game, like, the one who fell is on a cliff, and they have to hold on, making a chain to reach him. And those at the back are holding on tight, like in the game to stay up on the cliff. And they must not let go…*"

Snap the Whip, Winslow Homer, 1872

Lesson 2, Image 2: *"…a girl who wants to show she knows a piece by heart, without even looking at her fingers, so she plays it behind her head*."

Father and Daughter Playing Guitar, David Turnley, 1986

Lesson 3, Image 1: *"...there's the pot, which could maybe suggest it's something to take to help her heal…*"

The Sick Child, Gabriel Metsu, 1660

Lesson 3, Image 2: *"...they're playing skipping stones, and they're kind of having a contest to see whose stone goes the farthest or skips the most.*"

Boys Throwing Pebbles into the River, Karoly Ferenczy*, 1890*

Lesson 7, Image 2: "*I see a turtle being killed by someone. I think it's two people fishing for food, and they caught a turtle.*"

The Turtle Pond, Winslow Homer, 1898

Lesson 8, Image 3: "*I think the attic is like their secret hideout. It's like their base. And either the guy is trading with the other guy, or the two of them stole something together. He's showing it to him, like, 'look, look.'*"

Friends, Walter Rosenblum, undated

Lesson 9, Image 2: "*I think it's a boy who likes the girl, so he's singing at her window*."

July 7, Frederick Jones, 1958

Intrapersonal cognitive

Lesson 1, Image 1: "*I feel like it's kind of sad. I don't know why.*"

Children of the Sea, Jozef Israels,1863

These examples demonstrate the varying levels of depth in students' engagement with the artworks, with some students focusing on emotional responses while others make more complex cognitive interpretations. The cited examples highlight the diversity of perspectives among students, showcasing how different individuals interpret the same artwork in unique ways. This diversity is crucial for understanding the range of ToM manifestations. The examples also capture both emotional and cognitive responses, illustrating how students engage with the artwork on multiple levels. This dual engagement is essential for a comprehensive analysis of ToM and provides insight into the developmental stages of ToM in primary school students. Lastly, these examples offer a glimpse into the educational outcomes of using VTS in the classroom, demonstrating how art appreciation activities can enhance critical thinking, empathy, and perspective-taking skills.

Discussion

The references related to Theory of Mind (ToM) are explicit and align with both ToM concepts and aesthetic judgment (Mendonça et al., 2019). Table 3: Distribution of

Theory of Mind (ToM) Codes Across Different Artworks in VTS Sessions shows the number of ToM-related codes identified for each image presented during the VTS lessons. The variation in the number of codes per image reflects the differing levels of cognitive and affective engagement elicited by each artwork. This distribution provides insights into which types of images are more effective in stimulating ToM-related discussions among primary school students**.**

Table 3

Distribution of Theory of Mind (ToM) Codes Across Different Artworks in VTS Sessions

Lesson	Image 1	Image 2	Image 3
#1	14	13	12
#2	16	15	18
#3	27	31	29
#4	21	32	24
#5	8	7	18
#6	24	13	9
#7	4	13	18
#8	7	26	5
#9	20	14	11

Cognitive Interpersonal ToM: The reasons behind the variation in the number of ToM references are multifactorial. ToM is not a linear process; its development can vary depending on culture, contexts, and individuals' dispositions (Baron-Cohen, 2003). It can also fluctuate according to the cognitive efficiency of the participants. This cognitive efficiency, i.e., the children's ability to process information quickly and effectively, plays a central role in how young people interpret and react to works of art. In fact, the higher this efficiency, the more capable students are of perceiving complex cues within the artwork. For all these reasons, it is difficult to pinpoint specific images that would foster more ToM-related interactions. However, the contact between participating students and the selected works of art seems to explicitly encourage exchanges that involve recognizing others' intentions, emotions, or thoughts. For example, observations from one of the students during Lesson 6, Image 1 (Figure 1), highlight this aspect of intention recognition:

> **Student Y:** "*I think the little girl is waiting for someone at her school. She's probably waiting for someone to go home. And I think the guy on the ground, either he feels like Juliet or he hurt himself. He fell.*"

Figure 1

Lesson 6, Image 1, Girl with Polio, Rivington Street, Walter Rosenblum,1938

Affective Interpersonal ToM: Many remarks made by the young participants involved self-projection or identification in their interpretations. From a cognitive perspective, many statements were related to deduction and interpretation. During the art appreciation sessions, our young participants used reasoning processes to understand, explain, or predict the actions of the characters in the images observed. This required them to access their knowledge or facts related to either the protagonist or the contextual circumstances. As soon as the first image was appreciated, affective ToM manifestations were perceived. Observations from one of the students during Lesson 1, Image 1 (Fig. 2) illustrate this fact:

Student B: "*He doesn't really dare to go into the water*."

Figure 2

Image 1, Lesson1 Children of the Sea, Jozef Israels, *1863*

As noted in the literature on ToM and aesthetic experiences, depending on the situation, multiple meanings can be inferred from a single facial expression or image. This can lead students to exchange and discuss depicted emotions. For example, a dialogue between two students during Lesson 8, Image 2 (Figure 3), highlights this aspect of multiple perspectives:

> **Student Z**: "*Well, I think she's not making birds, but it's like their mansion with lots of birds flying around while she's painting*."
> **Student K**: "*I feel like, I'm against everyone. I say she's killing the birds*."

Figure 3

Lesson 8, Image 2 Creation of Birds, Remedios Varo, 1957

The initial selection of images included exclusively figurative images, often expressing interactions between humans. This selection was made based on the criteria proposed by the creators of VTS (Yenawine, 2013). The results also reveal the emergence of ToM during the collective appreciation of a work in the classroom, when joint attention comes into play within a group, and a student interprets and feels the work differently from others, or shares and confronts their interpretations (Savoie & Mendonça, 2018). The decoding of mental states in artworks, whether cognitive or affective, refers to the perception and identification of social information and environmental cues - in this case, the works of art projected in the classroom. These cues can include the actions of a character, the direction of their gaze, or their facial expression (Duval et al., 2011).

Implications

In groups, young students question, reflect, observe, and discuss the images appreciated (Yenawine, 2013). Students' cognitive efficiency plays a key role in these interactions, influencing, among other things, their ability to analyze and interpret visual elements of artworks. These interactions, observed in the results, confirm the links between aesthetic experiences and ToM, as verified in previous research through language, observation skills, and the group's joint attention (Bullot & Reber, 2013; Mendonça, 2020; Mendonça et al., 2019). These elements illustrate how aesthetic experiences in the classroom can contribute to the socio-emotional development of young elementary students.

The findings of this study have significant implications for Canadian art education practices. Visual Thinking Strategies (VTS) align well with the goals of the Canadian curriculum, which emphasizes visual literacy, critical thinking, and socio-emotional learning. By integrating VTS into art education, Canadian educators can foster empathy, perspective-taking, and cognitive empathy among students. For instance, the Art Canada Institute provides resources[1] that bring Canadian art into the classroom, offering cross-curricular lesson plans that introduce students to Canadian artists and their works. This approach not only enhances students' aesthetic experiences but also makes art education more culturally relevant. The inclusion of artworks from Quebec school curriculum in our study demonstrates how VTS can be adapted to reflect local cultural contexts, further engaging students. Additionally, empirical evidence suggests that activities promoting Theory of Mind (ToM) can reduce aggressive behaviors and enhance creativity, aligning with the broader goals of Canadian educational policies. Therefore, the implementation of VTS in Canadian classrooms can contribute to the holistic development of students, preparing them to navigate today's world.

Limitations

Very few references related to intrapersonal aspects of ToM were recorded. This finding contradicts the literature, which suggests that in elementary students, ToM first develops from the affective to the cognitive, and then from the intrapersonal to the interpersonal (Dvash & Shamay-Tsoory, 2014; Westby & Robinson, 2014). This can also be explained by the extrinsic characteristics of the VTS protocol design, which encourages participants to make observations based on the images and express their views from visible evidence in them.

The data collected in this study also highlights the relationship between ToM development and language development. Being young children, the participants sometimes had difficulty expressing their thoughts or feelings, which is reflected in our results through ToM expressions that were sometimes underdeveloped, very explicit, or direct. This observation supports the central role of language in ToM development, as explored in recent literature, which indicates a significant correlation between language development and ToM (Lockl et al., 2017; Atkinson et al., 2017; Weimer et al., 2017). However, it is important to note that examining the relationship between language development and ToM was not the primary objective of this study**.**

[1] https://www.aci-iac.ca/wp-content/uploads/2020/10/Art-Canada-Institute-Education-Newlsetter_Bringing-Canadian-Art-into-the-Classroom_Education-Newsletter.pdf

Conclusion

The fictional and figurative nature of the images appreciated through the VTS protocol stimulates questioning, assumptions, imagination, and the development of Theory of Mind (ToM) in young participants. This process fosters socialization and the adoption of diverse perspectives, which are essential for aesthetic judgment (Mendonça et al., 2019).

Skills related to ToM and language are known to help prevent aggressive behavior in schools (Weimer et al., 2017). These complex skills interact with the cognitive efficiency of young people, influencing their ability to process information, analyze social situations, and make informed decisions. This cognitive efficiency, combined with ToM and language skills, impacts various aspects of young people's lives, including their academic journey, social interactions, and creativity (Beloyianni et al., 2024). Therefore, aesthetic activities contribute to both the intellectual and emotional development of students, enhancing their creativity by strengthening ToM and improving their reasoning and problem-solving abilities.

In summary, this study not only advances our understanding of how Visual Thinking Strategies (VTS) can enhance Theory of Mind (ToM) development in primary school students, but also underscores the broader educational benefits of integrating art appreciation into the curriculum. By highlighting the importance of cultural relevance and providing practical recommendations for educators, this research offers valuable insights that can contribute to more inclusive, empathetic, and cognitively enriched classroom environments.

Aesthetic experiences, central to various art forms and artistic manifestations, awaken our senses to their fullest. They engage us in the present moment, fostering excitement and alertness (Robinson, 2000, 2015). Burton (1994) notes that students are encouraged to transform their human experiences into artistic expressions, finding meaning in their creativity and that of others. Through this process, they develop an appreciation and awareness of the arts. Aesthetic education aims to cultivate personality traits related to imagination and expressiveness, while also fostering self-confidence, perseverance, critical thinking, and empathy (Aghaosa, 2015; Burton, 1994; Greene et al., 2013, 2014).

The work presented here underscores the importance of incorporating aesthetic experiences in educational settings and integrating student-oriented activities into curriculum design (Wood & Copur-Gencturk, 2024).

Recommendations

To enhance the practical utility of these findings, we recommend the following concrete steps for curriculum design and teacher development:

1. **Incorporate VTS into Art Education Standards**: Provincial education departments should integrate VTS into official art education standards and guidelines.
2. **Develop Comprehensive VTS Lesson Plans**: Create and distribute VTS lesson plans that align with the Canadian curriculum, including culturally relevant artworks.

3. **Cross-Curricular Integration:** Encourage the use of VTS across different subjects to develop visual literacy and critical thinking skills.
4. **Professional Development Workshops:** Organize workshops focused on VTS for art teachers, covering principles, facilitation techniques, and curriculum integration.
5. **Ongoing Support and Coaching:** Provide ongoing support and coaching for teachers implementing VTS, including regular check-ins and access to VTS coaches.
6. **Resource Development:** Develop and distribute instructional guides, video tutorials, and case studies showcasing successful VTS implementations.
7. **Collaborative Learning Communities:** Establish communities where teachers can share experiences and challenges with VTS.

By implementing these recommendations, educators can maximize the benefits of VTS and support the holistic development of students, preparing them to navigate a diverse and complex world.

Suggestions for Future Research

The study's findings highlight several areas for future research that can further enhance our understanding of Theory of Mind (ToM) and its application in art education. One key insight is the need to explore artistic activities that specifically stimulate intrapersonal ToM, such as reflective journaling or individual art projects. These activities could help students develop a deeper understanding of their own thoughts and emotions, complementing the interpersonal focus of Visual Thinking Strategies (VTS) (Dvash & Shamay-Tsoory, 2014; Westby & Robinson, 2014). Additionally, the role of cognitive efficiency in interpreting and reacting to artworks suggests that future studies should investigate how different types of art activities influence cognitive processing and information retention in young students. Although examining the relationship between language development and ToM was not the primary objective of this study, the data highlighted its significance. Therefore, focused studies on the interplay between language development and ToM in the context of art education could provide valuable insights into how language skills enhance ToM-related discussions and interpretations during VTS sessions (Lockl et al., 2017; Atkinson et al., 2017; Weimer et al., 2017). The inclusion of artworks from Quebec school curriculum demonstrated the importance of cultural relevance in engaging students. Future research should investigate the effectiveness of VTS with culturally diverse artworks in different educational settings to understand how cultural relevance impacts students' engagement and ToM development. Finally, examining the long-term effects of VTS on students' socio-emotional development and academic performance through longitudinal studies could provide a deeper understanding of the sustained impact of VTS on students' overall growth and learning outcomes. These directions for future research offer clear and actionable steps to build on the contributions of this study and enhance the practical utility of ToM and VTS in art education.

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Appendix A – Artworks

Our selection of artworks was made from the proposed visual art collection of the VTS organization's website[2]. In preparation for VTS sessions, the researcher adapted the shown artworks' collection to reflect Quebec's distinctive culture. Some artworks containing overly iconic American cultural references were removed, such as flag images or American historical figures. They were replaced by familiar Quebec school curriculum artworks of similar complexity. All artwork selections were approved by a jury of experts.[3]

Lesson 1		
		
Image 1 Title: *Children of the Sea* Artist: *Jozef Israels* Date: 1863 Medium: Oil on Canvas Dimension: 91,5 x 132 cm Institution: Rijks Museum	Image 2 Title: *The Stay at Homes (Outward Bound)* Artist: Norman Rockwell Date:1927 Medium: Oil on canvas Dimension: 99,6 x 81,2 cm Institution: The Norman Rockwell Museum at Stockbridge	Image 3 Title: *Parade on Hammond* Street Artist: Allan Rohan Crite Date:1935 Medium: Oil on Canvas Dimension: 43,2 x 58,4 cm Institution: The Phillips Collection
Lesson 2		
		
Image 1 Title: *Snap the Whip* Artist: Winslow Homer Date:1872 Medium: Oil on Canvas Dimension: 55,8 x 91,4 cm Institution: Butler Institute of American Art	Image 2 Title: *Father and Daughter Playing Guitar* Artist: David Turnley Date:1986 Medium: Color photograph Dimension: SO Institution: David Turnley/CORBIS	Image 3 Title: *La Ronde des petites Bretonnes* Artist: Paul Gauguin Date:1888 Medium: Oil on Canvas Dimension: 57 x 74 cm Institution: National Gallery of Art (Quebec curriculum)
Lesson 3		
		
Image 1 Title: *The Sick Child* Artist: Gabriel Metsu Date:1660 Medium: Oil on Canvas Dimension: 33 x 25 cm	Image 2 Title: *Boys Throwing Pebbles into the River* Artist: Karoly Ferenczy Date:1890 Medium: Oil on Canvas Dimension: 51 x 61 cm	Image 3 Title: *A Meeting* Artist: Maria Bashkirtseff Date:1884 Medium: Oil on Canvas Dimension: 188 x 172,7 cm

[2] https://vtshome.org

[3] Jury was composed of two art teachers (Ph.D.) and the researcher.

Institution: Rijks Museum, Amsterdam	Institution: Hungarian National Gallery	Institution: Musée d'Orsay, Paris France
Lesson 4		
		
Image 1 Title: *The Stephens Children* Artist: Unknown Date:1845 Medium: Oil on Canvas Dimension: 160 x 129,5 cm Institution: Smithsonian American Art Museum	Image 2 Title: *Woman and Child in a Room* Artist: Paul Mathey Date: Around 1890 Medium: Oil on Canvas Dimension: 48,2 x 38,1 cm Institution: Musée d'Orsay (Quebec curriculum)	Image 3 Title: *La voiture d'enfant* Artist: Marcelin Desboutin Date: Between1823 and 1902 Medium: Oil on Canvas Dimension: 139 x 104 cm Institution: Musée Fabre (Quebec curriculum)
Lesson 5		

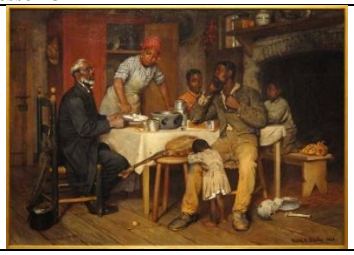
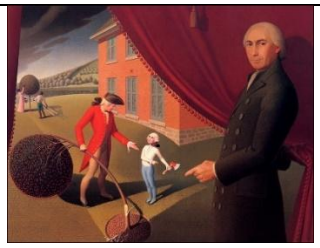
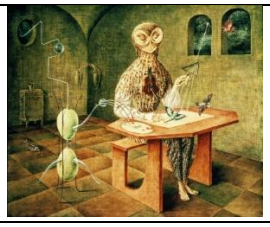

	

Image 1 Title: *Pastoral Visit* Artist: Richard Norris Brooke Date: 1881 Medium: Oil on Canvas Dimension: 119 x 67 cm Institution: Howard University Gallery of Art	Image 2 Title: *Parson Weems' Fable* Artist: Grant Wood Date:1938 Medium: Oil on Canvas Dimension: 47 x 40 cm Institution: Amon Carter Museum of American Art	Image 3 Title: *Cheever Meader and His Daughters* Artist: Doris Ulmann Date:1933 Medium: Photography Dimension: N/A Institution: Doris Ulmann Collection
Lesson 6		
		
Image 1 Title: *Girl with Polio, Rivington Street* Artist: Walter Rosenblum Date:1938 Medium: Photography Dimension: N/A Institution: The J. Paul Getty Museum	Image 2 Title: *Las Meninas* Artist: Diego Rodriguez Velázquez Date: 1656 Medium: Oil on Canvas Dimension: 314,9 x 274,3 cm Institution: Prado Museum (Quebec curriculum)	Image 3 Title: *Xina Graham-Vannais, Tyler State Park, Newtown, Pennsylvania* Artist: David Graham Date: 1994 Medium: Impression Double-coupler Dimension: N/A Institution: Laurence Miller Gallery
Lesson 7		

		
Image 1 Title: *The Art of Painting* Artist: Johannes Vermeer Date:1666 Medium: Oil on Canvas Dimension: 129,5 x 109,2 cm Institution: Vienna Art History Museum (Quebec curriculum)	Image 2 Title: *The Turtle Pond* Artist: Winslow Homer Date:1898 Medium: Aquarelle sur crayon Dimension: 38 x 54 cm Institution: The Brooklyn Museum of Art	Image 3 Title: *Cousin Reginald Spells Peloponnesus (Spelling Bee)* Artist: Norman Rockwell Date: 1918 Medium: Oil on Canvas Dimension: 76,2 x 76,2 cm Institution: The Norman Rockwell Museum
Lesson 8		
		
Image 1 Title: *St Albans, Vermont* Artist: Sheron Rupp Date: 1991 Medium: Impression dye-coupler Dimension: N/A Institution: The J. Paul Getty Museum	Image 2 Title: *Creation of the Birds* Artist: Remedios Varo Date:1957 Medium: Oil on Masonite Dimension: 52,3 x 62,7 cm Institution: Private collection	Image 3 Title: *Friends* Artist: Walter Rosenblum Date: N/A Medium: Black & White photo Dimension: N/A Institution: Artist's Collection
Lesson 9		
		
Image 1 Title: *The Egg Dance* Artist: *Pieter Aersten* Date:1552 Medium: Oil on Canvas Dimension: 84 x 172 cm Institution: Amsterdam, Rijksmuseum (Quebec curriculum)	Image 2 Title: *July 7* Artist: Frederick Jones Date:1958 Medium: Oil on Canvas Dimension: 73,6 x 60,9 cm Institution: Minnesota Museum of American Art	Image 3 Title: *Negro Boys on Easter Morning. Southside, Chicago, Illinois* Artist: Russell Lee Date:1941 Medium: Photography Dimension: N/A Institution: Farm Security/Administration/Office of War Information collection at the Library of Congress