Analysis of Children's Conceptions of Reading, Writing and Counting

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Abstract

The aim of this work is to describe and interpret children's ideas about the concepts of reading, writing, and arithmetic using a qualitative approach. Phenomenological analysis made it possible to identify and describe themes that are typical of ideas about the meaning of the concepts of reading, writing, and arithmetic in a selected group of children (Koutná Kostínková and Čermák, 2013). In individual interviews, eight children aged five to six answered the following questions: descriptive "What is it?", applicative "What is it for?", evaluative "What would happen if it weren't there?" and a question about the source of knowledge "How do you know that?". The questions were clarified and developed in the interviews to reveal the unique experiences of the children as much as possible (Babiaková, 2019). The transcripts of the interviews were analyzed by first formulating themes for each child individually and then for the whole group. Based on the gradual discovery of relationships and their graphical representation, groups of themes were created. The overarching themes of the concept of reading were books, fairy tales, learning, and wisdom. For the concept of writing, it was writing names and words, and for the concept of counting, it was counting something and writing numbers. Children most often associated the processes of writing, reading, and counting with family, seeking knowledge, and practical activities that use them. Conceptualizations suggest that children talked about these processes based on sensory and practical experiences (Bloom, 2015). These findings may be useful in adapting preschool education content to children's conceptual ideas, experiences, and abilities.

Keywords: *children's preconceptions, phenomenological analysis, reading, writing, counting*

1. Introduction

A concept (as a word or symbol) is the result of complex logical and cognitive operations. However, during the preschool period, children do not yet possess the capacity for abstract thinking required to fully engage in these operations. At this developmental stage, they are situated within the phase of so-called preconceptual thinking. Instead of fully formed concepts, they use preconcepts—imprecise, schematic, and subjective representations of the world. Their limited experience and knowledge constrain their ability to grasp the degree of generalization associated with linguistic symbols and to determine the criteria for categorization, which inhibits their understanding of abstract concepts. Consequently, their comprehension relies heavily on concrete imagery, visual thinking, and direct sensory experiences. According to Piaget and Inhelder (1997), children's mental representations of reality that emerge through independent thinking are referred to as spontaneous concepts. In contrast, concepts acquired through instruction or mediated by adults are termed scientific concepts. In the preschool years, even scientific concepts tend to remain concrete and context-bound. Research conducted by Lipnická and Vrábľová (2024) revealed that children predominantly expressed spontaneous concepts, often replacing insufficient objective knowledge with subjective interpretations of word meanings. These interpretations, although anchored in real-world elements, were marked by egocentric and concrete characteristics. Vygotsky (2017) emphasized that conceptual development does not occur in isolation but emerges within broader sociocultural interactions. The transition from concrete to abstract thinking is mediated by language, which functions not only as a labeling tool but also as a cognitive instrument that facilitates the organization of knowledge, the categorization of experiences, and the construction of conceptual structures. Children's imagination plays a crucial role in connecting personal experiences with conceptual meanings, forming a foundation for the development of conceptual thought. The act of naming and describing their internal representations constitutes a pivotal step in cognitive differentiation and generalization. Detachment from perceptual thinking begins to manifest toward the end of the preschool period, as children begin to form the rudiments of abstract reasoning (Vygotsky, 1976). The development of concepts is dialectical, arising

from the interaction between the ability to abstract and the accumulation of specific experiences. Language as a cognitive tool enables individuals to create meaningful relationships between concepts and apply them in thinking and communication. Bloom (2015) argues that the process by which children acquire language plays a key role in their understanding of the meanings of words. In this process, adults and the surrounding environment provide the necessary linguistic stimuli and support. Children learn meanings in the context of specific objects and situations, with their curiosity and questioning being key to the dynamic nature of concept acquisition. According to Vygotsky (2017), a new concept or idea becomes meaningful for a child only when they are able to apply it functionally in their thinking and communication. The importance of the environment and the sociocultural context in language and concept acquisition is further supported by studies such as those of Yıldırım (2020) and Vužňáková (2018), which highlight the role of cultural conditions and individual world knowledge in children's interpretation of word meanings. As a result, significant individual differences emerge in children's understanding and use of concepts.

1.1 Development of Conceptual Understanding in Children up to Six Years of Age

The development of conceptual understanding in early childhood is a complex and dynamic process influenced by the interaction of linguistic, cognitive, and social factors. This development is not solely determined by vocabulary growth and language abilities, but is closely linked to the child's overall development, reflecting the quality and nature of their interactions with the environment. As noted by Lipnická (2019), this involves the child's interaction and communication not only with social partners but also with themselves and with media across various life and educational contexts and roles. According to Bytešníková (2012), the process of acquiring words and their meanings can be divided into three fundamental stages: in the first stage, the child becomes acquainted with new concepts; in the second, the meanings of these concepts are refined within broader contexts; and in the third, children actively use these concepts in their verbal expression. Langmeier and Krejčířová (2006) emphasize that individual differences in language abilities among children are more pronounced than age-related differences alone. By the end of the first year, children respond to sounds, particularly the voices of their mother and caregivers, and perceive simple words within everyday activities. They acquire word meanings primarily through specific, often repetitive situations associated with the satisfaction of basic needs. Between the first and second year of life, children begin to use their first words and simple two-word combinations. Their receptive vocabulary exceeds their expressive vocabulary—they understand more words than they are able to produce. At this stage, comprehension extends beyond situational context and includes basic generalizations (Horňáková, Kapalková, & Mikulajová, 2005). As Lipnická (2019) points out, children at this age are capable of identifying named objects and naming them, although often with imprecise articulation. During the third year of life, children begin to form simple sentences, a development linked to an increasing understanding of relationships between words and the differentiation of conceptual meanings. They begin to ask questions, thereby expanding their vocabulary and deepening their understanding of linguistic meaning in their environment (Thorová, 2015). Between the third and fourth year, children show improved comprehension of more specific, concrete concepts, particularly those grounded in their everyday experiences. Their understanding of verbal meanings relies on the integration of verbal and nonverbal communication signals, which must be aligned to enable accurate interpretation of meaning (Bednářová, 2011; as cited in Hollá, 2015). By the age of four to five, children are able to work with broader conceptual meanings in more objective contexts. Their understanding is no longer solely tied to personal experience—they begin to grasp more abstract concepts conveyed by others. At this stage, they acquire semantically more complex lexical units, including homonyms, synonyms, and antonyms (Thorová, 2015). Five- to six-year-old children are able to differentiate broader meanings of concrete concepts and simultaneously understand narrower meanings of abstract concepts, provided they have sufficient experiential background. Their explanations of word meanings are often based on personal experiences and are less reliant on immediate interactions. They describe meanings through concrete features, properties, and external characteristics of people, objects, phenomena, and processes (Lipnická & Vrábľová, 2024).

1.2 Research Objective

The primary objective of this study was to identify the conceptual constructions of the terms reading, writing, and counting in the minds of five- and six-year-old children through a phenomenological analysis. The aim was to explore how these cognitive representations reflect children's readiness for

the systematic acquisition of basic literacy and numeracy competencies within the context of entering primary education. Given that six years of age marks the beginning of formal schooling in the Slovak Republic, it is crucial to understand how children conceptualize these processes prior to their exposure to structured instructional methodologies aimed at developing foundational literacy. According to Bloom (2015), analyzing children's understanding of such concepts represents a cognitively demanding process that also presents a challenge for developing innovative methodological approaches. One such approach was applied in this study, and its outcomes are presented in this paper.

2. Methods

The aim of the qualitative study was to understand children's ideas and experiences in reading, writing, and arithmetic through phenomenological analysis. The concepts were selected from the state curriculum based on the Delphi method (Lipnická & Vrábľová, 2024). The research was conducted with eight children aged five to six who were at the end of their last year of pre-primary education (June 2024). The children were educated according to the school curriculum developed in accordance with the State Education Program for Pre-primary Education in Kindergartens (2022). Participants were selected on the basis of informed consent from their legal guardians, who were informed of the objectives, course, and use of the research results (Krajčírová, 2025). Data collection was carried out through individual semi-structured interviews conducted in the natural environment of the kindergarten in the presence of the class teacher. This ensured the authenticity of the children's responses. The interviews were designed to encourage spontaneous expression of children's experiences and ideas. The children answered four types of questions: descriptive ("What is it?"), application ("What is it for?"), evaluative ("What would it be if it weren't?") and a question focused on the source of knowledge ("How do you know?"). In accordance with Babiaková's methodology (2019), the questions were adapted to the situation and developed with the aim of stimulating the children's conversation. The interviews were audio recorded with the consent of the legal guardians and subsequently transcribed. The complete anonymity of the participants was ensured. Data analysis was performed using thematic analysis. In the first phase, themes were identified within individual interviews, and then the themes were grouped and analyzed at the level of the entire sample. The process culminated in the creation of clusters of superordinate and subordinate themes, which were formed through the gradual discovery of meaningful relationships between individual statements and their graphical representation.

3. Results

Tables 1 and 2 show the results of all children in the research sample, specifically their conceptions of reading, writing, and counting in all four types of questions.

Table 1. Scatter Plot of Thematic Cluster Distribution by Question Type

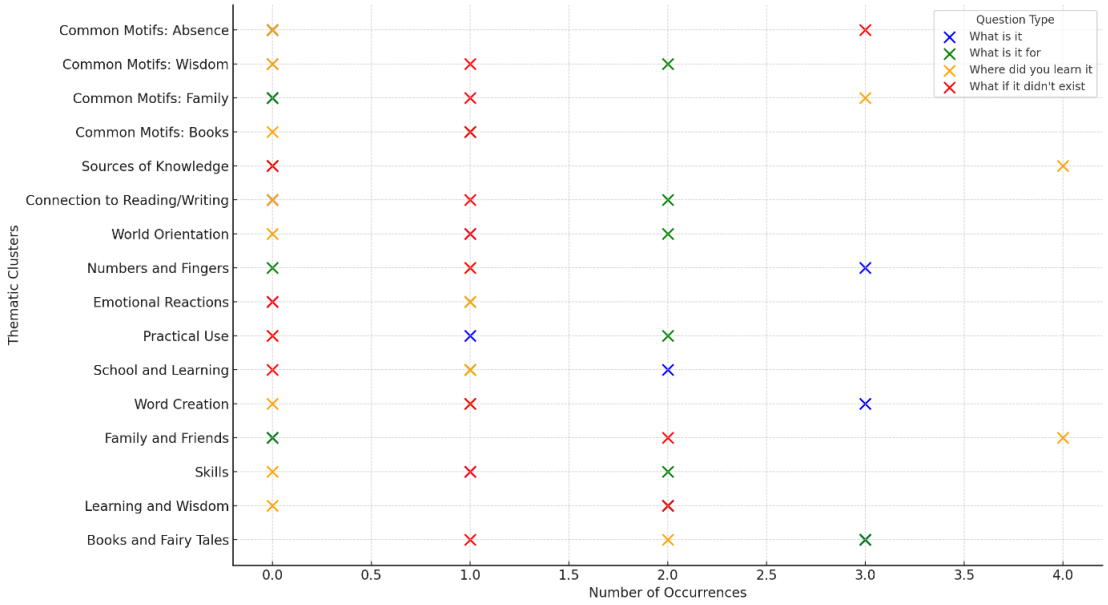
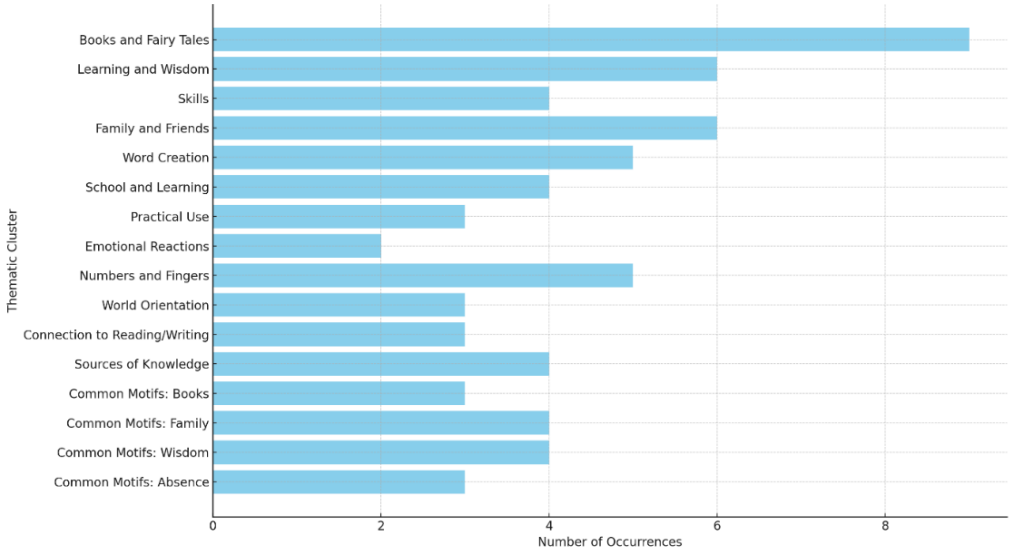


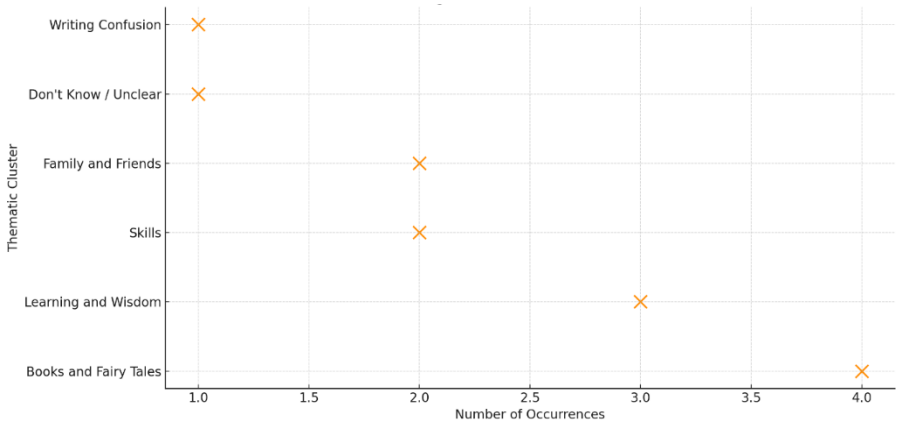
Table 2. Frequency of Thematic Clusters in Children´s Statements



Children's Conceptions of Reading

Children perceived reading as a multifunctional tool – they associated it with learning, entertainment, communication, and knowledge. Their understanding was conditioned by personal experience, parental influence, and environment. Although their statements contain inaccuracies or confusion of concepts (reading vs. writing), they reflect the natural process of using reading. The analysis confirmed the importance of family and books, respectful guidance, and a stimulating environment for children's language development. Table 3 present the results of all children in the research sample, specifically their ideas about reading in all four types of questions.

Table 3. What is Reading? Scatter Plot of Thematic Clusters



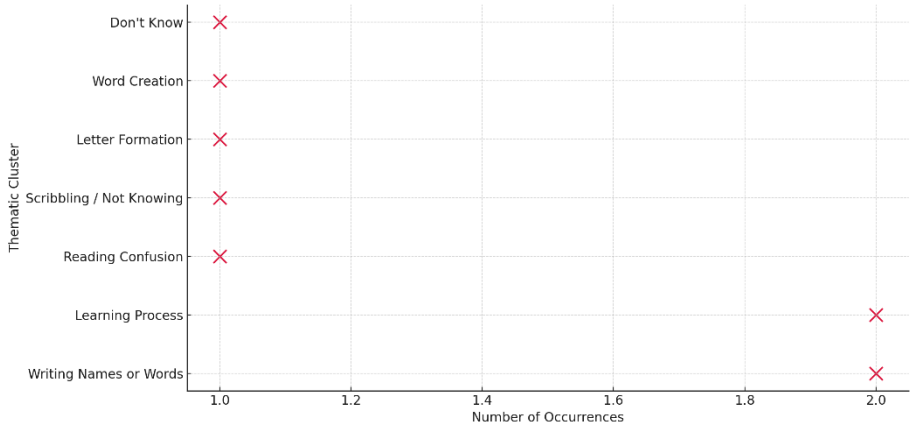
Children understood reading *(What is reading?)* as interaction with a book, as a tool for learning, reading, and writing. Some children confused reading with writing, which is typical of early literacy development. Children associated reading with activities that involve books – looking at books: *"we look at books"* and reading books: *"you read any books."* According to some children, it is a learning process, such as learning letters: *"you learn letters," "you learn to read a book,"* or a creative process, such as fairy tales: *"reading is like those books where there are blank pages and you can write any fairy tale or anything else you want."* Some children probably have no experience with reading: *"I can't describe it," "I don't know what it is, I know what it is, I just don't know how to say it,"* or they confuse reading with writing: *"you write something."* When asked about the purpose of reading *("What is reading for?"),* children responded in ways that reflected their individual cognitive and language abilities. Some children perceived reading as a source of entertainment: *"for fairy tales, I guess," "so we can read fairy tales to children,"* while others were aware of the importance of reading in education*: "so we can learn well," "so we can write," "so we can write and read books,"* as well as in everyday life*: "so we can read fairy tales to our children when we have them."* In some cases, there were answers referring to the physical and mental benefits of reading: *"so you can see well," "so you can be smart."* The statement *"I don't know"* reflects an awareness of the limitations of one's own knowledge. In children's answers to the question: *"How do you know about reading?",* connections with people from their social environment appear. Family members are the primary mediators of knowledge: *"My mom told me when I was four," "Because she sometimes reads fairy tales to me, my dad reads to me, so I know."* These statements point to the important role of parents as mediators of literacy and information. Children's answers to the evaluative question *("What would it be like if there were no reading?")* are rich in concrete ideas, emotional reactions, and certain evaluative judgments. Children perceived books and reading as a source of fairy tales and stories*: "and then they wouldn't hear any fairy tales if there were no books," "that would be the worst thing for me, because everyone loves fairy tales," "well, then they would have to tell stories to children. But they would have to make them up."* These statements point to an understanding of books as the primary medium for transmitting stories. Without reading and books, they would not be able to learn: *"because we wouldn't be able to count, learn, or read books," "we wouldn't be able to read," "there wouldn't even be words."* Some children could not imagine writing without reading, for example, to people who are emotionally close to them: *"then they wouldn't be able to read or write to their friends or anyone else, like their grandmother..."* This statement points to an understanding of literacy as a tool for personal interaction and information exchange. Children spontaneously identified the social function of reading and writing.

Children's Conceptions of Writing

Children most often associated writing with writing words and letters, with their own names being the dominant motif. At the same time, it became apparent that some children still do not distinguish between reading and writing and do not understand them as interrelated activities. They explained writing as a tool for practical use—recording information and personal communication.

Table 4 shows the results of all children in the research sample, specifically their opinions on writing in all four types of questions.

Table 4. What is Writing? Scatter Plot of Thematic Clusters

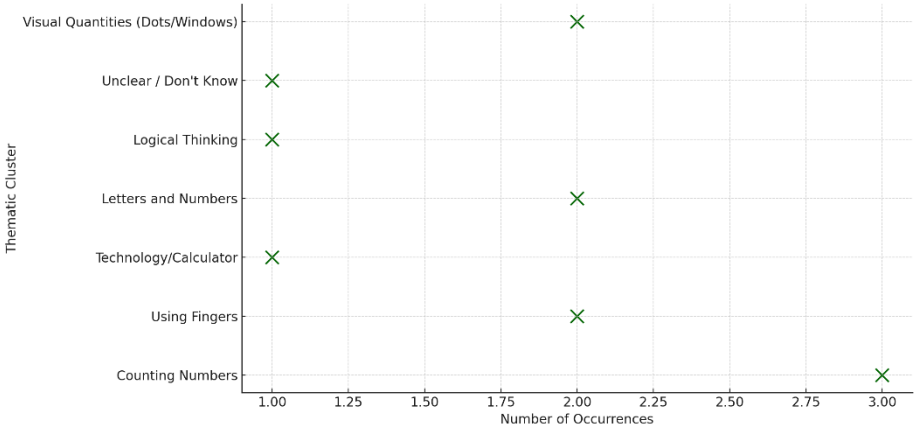


Children associated writing (What is writing?) with writing their names or letters in words: "In my opinion, writing is when we write our names or something else," "when we write letters on paper," "writing is when we create words from letters." These are concrete experiences that make sense to children. Some children showed uncertainty in their descriptions or a lack of understanding of the concept. These are manifestations of preconceptions, when a child does not yet have a stable frame of reference for a given concept but intuitively imitates or performs an activity. When asked about the purpose of writing ("What is writing for?"), they responded pragmatically: "to learn how to write," "writing is for knowing words and letters well." Children thought of writing as a learning process. Their statements show that they understand writing in a broader educational context: "It's so that we can learn everything at school, so that we can write something on paper, because I write at home sometimes and I don't know what I'm writing, so I just write something random. I write R and things like that and I don't know what it is." The children's answers to the question: "What is writing for?" also revealed their uncertainty: "Well, I just know, my memory told me." Other children answered with confidence in their own path of discovery: "No one told me, I figured it out myself," "I figured it out myself when I was little." Two children were unable to answer this question. Another girl replied: "I guess I guessed it (laughter)." The children's answers to the evaluation question ("What would it be like if writing didn't exist?") again focused on practical situations: "You couldn't buy books or anything with letters on them, because if there were no letters, there would be no books, because books have letters so you can read what the story is about." "Then he would just sit at home and look at his phone like our 'name' (his sister). He doesn't study at all because today is a holiday and I still go to kindergarten," "Well, they would have to tell stories to children. But they would have to make them up. These statements reveal the beginnings of a more abstract understanding of writing as a system associated with books and reading. This is a more advanced stage of conceptualization, in which the child is aware of the function of writing.

Children's conceptions of Counting

Table 5 shows the results of all children in the research sample, specifically their opinions on counting in all four types of questions.

Table 5. What is Counting? Scatter Plot of Thematic Clusters



Children most often associated counting (What is counting?) with manipulating numbers and fingers: "It's when you count numbers. You point to your fingers and then say how many there are," "and when we count everything and don't know how to write yet, we can use our fingers to show how many there are...". This type of representation is typical for concrete operations. Children use physical objects to help them visualize quantities. According to Piaget, this is a typical way of acquiring quantitative relationships in the preoperational stage of development. Some children associated counting with saying numbers aloud: "So it's one, two, three, and so on" or with digital devices: "Well, you can count it on a computer or tablet. Or... on a calculator." This statement suggests that the technological environment shapes children's ideas about mathematical operations. They perceived writing numbers as part of counting: "so that we can write numbers and count," "so that we can learn to count and write." One child understood that a number expresses a certain quantity: "it's how many there are, or how many dots there are." Another child had not yet separated the concepts of "letters and numbers." When asked about the purpose of counting ("What is counting for?"), some children responded pragmatically: "to write books and stories, so we can write...", "in old books where there are letters, numbers are also used." They perceive numbers as part of the organization of text: "so we can count letters and numbers well." For some children, counting is a form of social interaction: "when the teacher asks us who can count..." and for some children it is a path to wisdom: "so that you have a wise head." Another child based their answer on the practical use of counting: "I count the windows on the house or cars..." and others on thinking in the brain: "People think about it in their brains..." Reason and learning prevailed in the children's answers to the question "How do you know how to count?" "I thought about it and then I learned it," "I figured it out myself," "It occurred to me." Children are aware that counting depends on their cognitive activity. One girl said about her experience with her father: "My father told me when I was one year old." This statement points to the importance of the family in the early learning process. Overall, the answers were simple and not very informative. Explaining causes and consequences is related to causal thinking, which is part of logical thinking. This is a key argument for this finding.The children's answers to the evaluation question ("What would it be like if there were no counting?") were expressed practically, that people would not know anything: "People wouldn't know how to count, for example, that there is a number one drawn here, that there will be a performance on the ninth, for example, they wouldn't know that, and so on." "You wouldn't know how many houses there are or how many windows you have in your house," " we wouldn't know how old we are," "in books where there are numbers, we wouldn't know what page we're on," "then there would be no letters for counting and counting, so there wouldn't be one or twelve." This showed that they are aware of the importance of numbers and counting in certain situations.

4. Discussion

The study may be useful for the development of science and practice in preschool and primary education. It presents the results of a phenomenological analysis of children's statements about reading, writing, and arithmetic. It defines key themes in children's ideas and illustrates them with quotations from their statements. It shows how children perceive these processes during the transition from preschool to primary education. Such research is also important because teachers can build on children's ideas and experiences with processes that they will learn through conventional methods in the first grade of primary school. Four types of questions made it possible to ask children about their basic understanding, as well as the application and evaluation of these processes. Causal

relationships are a weak point in their statements. According to Piaget's theory, preschool children think concretely. This was also confirmed by our study. Children explained reading, writing, and counting based on concrete experiences and visual stimuli. More abstract aspects appeared marginally in the children's statements. In line with Piaget's theory of cognitive development, the meaning of children's statements can be interpreted at the preoperational level of thinking. These findings are also consistent with Bloom's theory of concept acquisition. Children's direct experiences with concrete objects are crucial for their understanding of the meaning of words. Children's ideas about the relationship between writing and reading are still inaccurate. They understand their connections in everyday activities and situations in a specific sociocultural space. This phenomenon is consistent with Vygotsky's theory of sociocultural development. The findings also correspond to those of Langmeier and Krejčířová (2006) and Thorová (2015). Children's ideas about the processes of reading, writing, and counting were mainly at the level of concrete associations, i.e., naming the basic characteristics and parts of these processes or reformulating the content of a question into an answer. An analysis of children's statements showed that preschoolers understand reading as a multidimensional social and practical process, not as a process of decoding meanings from texts. They imagine this process as a source of entertainment, learning, knowledge, and a means of communication, with personal experiences and family influence playing an important role. They understand reading as an activity that conveys stories, promotes learning, and enables emotional bonds with loved ones. Some children are aware of the consequences of not reading, such as losing the opportunity to listen to fairy tales, stories, communicate, and learn. This shows an early understanding of reading as a basic skill necessary for functioning in society. Children's ideas about writing are also shaped by specific experiences and the pragmatic use of writing in everyday life. Children most often associated writing with writing their own names or letters. Children reflected on writing as a tool for learning, communicating, and storing information, with their responses often based on everyday reality and school experiences. In some cases, there were also signs of a more abstract and systematic understanding of writing as a prerequisite for the existence of books and reading, which indicates a developing ability to conceptualize. Uncertainty in responses to questions about the origin of knowledge about writing points to intuitive and experiential learning that is not yet fully consciously reflected. Children's ideas about counting are strongly rooted in concrete experience and sensory-motor manipulation, especially through the use of fingers. Children in the pre-operational stage of development naturally use physical tools to understand quantitative relationships, thereby acquiring the basic principles of counting. However, their statements also reveal elements of more abstract thinking, such as awareness of number sequences, technological tools, and the pragmatic and social significance of counting. The responses also point to a nascent understanding of causality and the cognitive processes involved in learning, whereby children intuitively distinguish between knowledge gained through experience, learning, or their own reasoning.

5. Conclusion

The analysis showed signs of early stages of literacy development, reflecting children's cognitive abilities, language skills, and social context. The findings emphasize the need for a respectful approach to literacy development, in which the family, reading culture, and a stimulating language environment play an irreplaceable role. Children's understanding of reading, writing, and arithmetic in preschool age is not primarily based on formal definitions, but on specific experiences and the social environment in which children live. They perceive reading as a meaningful and emotionally charged activity that serves communication, learning, and entertainment, and is often associated with close persons. Writing is mainly associated with practical uses—writing down names, storing information, and school activities—while children do not yet distinguish precisely between its form and function. Counting is a tool for children to orient themselves in the world, supported by sensory experiences and manipulation of objects. In all areas, there is a functional, pragmatic, and social dimension to children's ideas, which are shaped by personal experiences and the family and school environment. The findings underscore the importance of a respectful and developmentally appropriate approach to the development of literacy and numeracy skills, where play, exploration, shared reading, and experiential learning should play a key role. The development of these competences requires the support of an environment that understands children's perspectives as a starting point for learning and developing basic cultural tools – reading, writing, and arithmetic.

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