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FACULTY OF PSYCHOLOGY AND EDUCATIONAL SCIENCES
DOCTORAL SCHOOL "EDUCATION, REFLECTION, DEVELOPMENT"

SUMMARY OF THE DOCTORAL THESIS

METACOGNITIVE READING STRATEGIES. APPLICATIONS FOR PRIMARY SCHOOL

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Keywords: reading comprehension, reading comprehension difficulties, metacognition, metacognitive knowledge, comprehension monitoring, error detection, metacognitive reading strategies, teaching, primary school, therapeutic logopedic program.

INTRODUCTION

Motto: "A complete analysis of the process that takes place when we read would be nearly the pinnacle of achievements for psychologists, because such an analysis would mean deciphering many of the most intricate activities of the human mind." (E.B. Huey)

Reading is a fundamental skill for students. The inability to understand what is read has a negative impact on school performance, being a major factor in school failure and dropout. The issue of functional illiteracy, highlighted by the poor performance of Romanian students in international tests such as PIRLS and PISA, has led to reforms in the Romanian education system. The analysis of Romanian students' performance in international tests revealed a series of determining factors for the modest results, including: lack of text processing tools, misunderstanding of the questions, lack of practice with multiple-choice items with plausible distractors, difficulty in selecting essential information, insufficient training on non-literary texts, and the habit of providing answers from memory without verifying if their answer makes sense by comparing it to the information in the text (Mancaș, Stoicescu, & Sarivan, 2013). It seems that students do not employ strategies for monitoring and controlling comprehension, known as metacognitive strategies. Although these strategies are not visible, often being automatic and unconscious, a series of studies have shown that they can be taught and learned even at younger ages, leading to a deeper understanding of the meanings of the information (Eilers & Pinkley, 2006).

Reading comprehension is a complex interaction between the reader and the text, and students must develop both fluency in reading and metacognitive strategies to understand and utilize the information in texts. However, opinions regarding the teaching of reading strategies before middle school are divided, with the reasons cited being cognitive immaturity and cognitive overload in students. In this context, a primary research question is whether, and to what extent, primary school teachers are aware of teaching strategies that facilitate metacognition in reading, and what possible factors are associated with these practices. Identifying a potential gap in this area would form the basis for implementing a teacher training program in metacognition in reading for young schoolchildren. Conversely, finding that these practices already exist among primary school teachers would indicate the need for a differentiated and individualized approach for students with comprehension difficulties, focusing on regulating and monitoring reading.

Studies on the relationship between reading comprehension and metacognition in young students are controversial, with some showing an association between the two variables, while others yield insignificant results. Therefore, the second research question is whether, and to what extent,

primary school students are aware of using metacognitive strategies in reading, and what the relationship is between metacognition and text comprehension.

Metacognition is essential for learning success, and students with high metacognitive abilities can monitor and adjust their learning process. Metacognitive instruction should be a means, not an end, in education and should help students develop self-regulation mechanisms. While proficient readers often spontaneously acquire metacognitive control, some students require explicit instruction to improve their text comprehension.

From my own professional experience as a speech therapist, I have found that students with reading difficulties can make significant progress in fluency and accuracy through the use of specific strategies, but success in the classroom also requires the development of comprehension skills. The third research question is whether, and to what extent, students with comprehension difficulties can be supported in overcoming these gaps through speech therapy. We wonder if, through the explicit teaching and modeling of evidence-based comprehension strategies, adapted and individualized, we can facilitate the development of metacognition and address the comprehension difficulties of students.

In the school context, speech therapy combines educational and clinical elements, offering a unique framework for effective interventions for students with comprehension difficulties. This multidisciplinary approach is considered a model of best practice for speech therapists and a useful guide for teachers and others involved in the education of primary school students. The current intervention will serve as both a model of best practices for speech therapists and a useful reference for teachers, parents, specialists, and others interested in addressing comprehension difficulties in primary school students.

Chapter I. PSYCHOPEDAGOGICAL ASPECTS OF READING COMPETENCE

Reading is a goal-oriented activity, such as for information or learning, and it involves both the automated decoding of words and the interpretation of the text. To read efficiently, quick and easy decoding is necessary, which allows for the correct understanding and interpretation of the text.

I.1. Essential characteristics of the reading process: decoding, fluency, and comprehension

The simple view of reading model defines reading as an interaction between word decoding and verbal comprehension (Kendeou, et al., 2009; Tennent, 2014). This model suggests that in order to understand a text, the reader must have well-developed skills in both areas. Studies show that the

importance of decoding decreases as children progress in school, while verbal comprehension becomes more relevant (Catts, Hogan, & Adlof, 2005). The model is useful in identifying the profiles of inefficient readers, allowing for specific educational interventions to improve both decoding and comprehension. However, there are differences between the comprehension of written text and oral language, which indicates the need for distinct approaches in the teaching of reading and understanding (Cain, 2012; Wolf, et al., 2019).

I.2. The competence of receiving written messages in primary school

According to the communicative-functional model, reading does not develop independently but in relation to the processes of listening, oral, and written expression. The competence of receiving written messages is progressively built from preparatory classes to the fourth grade. The curriculum is aligned with international PIRLS standards and incorporates innovative methods to stimulate and develop reading comprehension. In the first three grades, the competence of receiving written messages is developed through four specific skills, focusing on students' ability to read, recognize, and understand words, short sentences, and symbols from their familiar environment. Students are encouraged to express their interest in reading simple texts. By the end of the second grade, they should be able to read texts of up to 120 words and differentiate between types of texts. In the third and fourth grades, the skills become more complex, including the evaluation and interpretation of longer and varied texts, developing their own opinions, and associating the text with personal experiences.

In the educational system, the acquisition of reading takes place in two major stages (Crăciun, 2020; Molan, 2019; Neacșu, Nuță, & Sârbu, 2008; Șerdean, 2002, in Petrescu, 2019): a) learning the technique of reading and b) acquiring the tools for working with books. The first stage, which spans from preparatory class to second grade, focuses on developing the ability to correctly and fluently decode words, sentences, and short texts, primarily using the phonetic, analytic-synthetic method. This involves learning letters, syllables, words, and sentences through a process that combines analysis and synthesis. In the post-phonics period, students consolidate and automate their reading skills, preparing for explanatory reading, which involves both understanding and interpreting the text. Reading qualities - accuracy, fluency, awareness, and expressiveness are developed through exercises and educational games.

The second stage of reading acquisition is based on explanatory reading. In the third and fourth grades, students study both literary and non-literary texts, going through distinct teaching phases. For narrative texts, the process involves preparing for reading, reading the entire text,

analysis, and synthetic reconstruction of the text, while for informational texts, emphasis is placed on activating prior knowledge, explaining terms, and synthesizing information. School textbooks suggest a series of methods and exercises to improve students' understanding of literary and informational texts. These include activities such as reading aloud, explaining unfamiliar words, analyzing texts through specific questions, and using graphic and interactive methods to deepen content. Various methods, such as role-playing, the Venn-Euler diagram, or the reading journal, contribute to the development of critical thinking and creativity (Mihăilescu & Pițilă, 2019). Although these techniques are effective, some students do not achieve the desired reading competencies due to personal, social, or pedagogical factors, exposing them to the risk of school failure.

I.3. Reading Difficulties

Reading difficulties in students vary in severity and can affect both decoding and text comprehension. These difficulties are often classified under medical terms such as dyslexia or reading disorder, terms recognized by manuals such as DSM-5 and ICD-11 (American Psychiatric Association, 2013; World Health Organization, 2022). Specific learning disorders, including dyslexia, are characterized by persistent difficulties in reading, writing, and mathematical calculations, which cannot be explained by other intellectual or sensory conditions. The cognitive deficits observed in students with reading difficulties are related to phonological recoding, rapid naming, orthographic decoding, as well as understanding and processing word meanings and complex syntactic structures (Schindler & Richter, 2018). Remediation methods rely on repeated practice of content until it becomes automatic, and interventions are planned based on a prior psychopedagogical assessment. Scientifically validated methods for improving reading fluency include phonological, morphological training, and video self-modeling (Bodea-Haţegan & Talaş, 2016).

There are debates regarding the classification of these disorders and the usefulness of distinguishing between dyslexia and poor readers. In the educational context, identifying and addressing reading difficulties is essential to provide appropriate support to affected students. In school, students with reading difficulties benefit from specific recovery therapies provided by specialists from the psychopedagogical team (speech therapists, support teachers, school counselors). Personalized interventions, tailored to the individual psychosocio-pedagogical profile, have proven to be the most effective means of addressing the challenges faced by students in their educational journey (Chiș & Grec, 2016; Gherguț, 2023; Mara, 2009; Roșan, 2015).

Chapter II. UNDERSTANDING READING. CONCEPTUAL DELINEATIONS

II.1. Defining the term "reading comprehension"

Reading comprehension and reading understanding are similar concepts, with cognitive psychology predominantly using the term comprehension, while pedagogy or education more often use the term understanding. Pardo (2004, cited by Tennent, 2014, p. 20) defines reading comprehension as "the process in which the reader constructs meaning through interaction with the text based on prior knowledge and experience, information from the text, and the position the reader adopts in relation to the text." According to Shanahan (2005, p. 28), reading comprehension is "the act of understanding and interpreting information from the text" and involves constructing meaning from interaction with the text, using the organization of the author's ideas while filtering the information through our prior knowledge and making inferences where the author does not provide them (Shanahan, 2005). The common notes in the above definitions are that comprehension is an interactive process from which the reader extracts meaning and significance.

II.2. Theoretical and applied models of reading comprehension

II.2.1. Bottom-up, top-down, interactive models

Reading models are theories that attempt to explain the mechanisms and processes involved during reading and form the basis for developing reading instruction programs. Reading processes can be classified into three categories, often described as bottom-up, top-down, and interactive processes (Manzo & Manzo, 1995). Bottom-up models focus on extracting meaning from the text through a sequential process that starts with letter recognition and ends with understanding the meaning, without involving the reader's prior knowledge. Top-down models emphasize the reader's prior knowledge, which influences text comprehension through predictions and comparisons with what the reader already knows. Interactive models combine these approaches, suggesting that reading involves both the activation of prior knowledge and the decoding process to extract meaning from the text.

II.2.2. The construction-integration model of text comprehension

The construction-integration model of reading, proposed by Kintsch (Kintsch, 2013, cited by Reutzel, 2016), involves two main cognitive processes: construction and integration. In the construction process, the reader forms a text base by decoding words and organizing them into a

coherent structure, using prior knowledge to understand what the text is saying. The integration process involves relating this text base to the reader's knowledge and personal experiences, thus creating a situation model of the text, which reflects the understanding of the text's meaning. This model explains why readers can interpret the same text in different ways depending on their personal experiences.

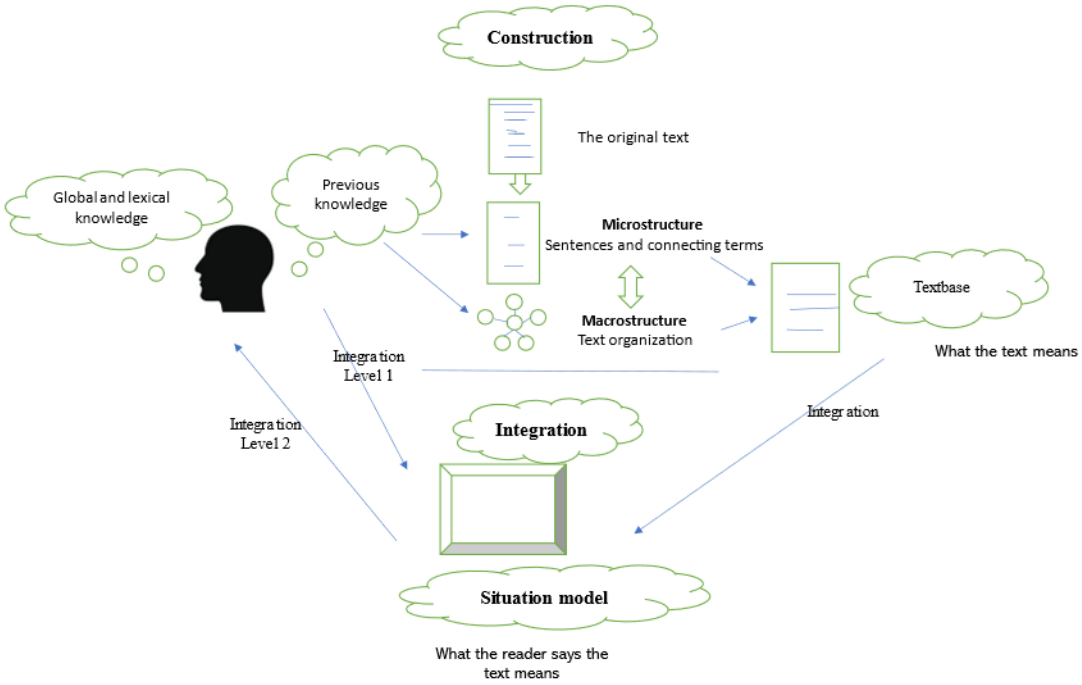

Figure 2.II. The Construction-Integration Model (adapted from Reutzel, 2016)

For a complete integration of meanings, the content from the situation model must be transferred to the basic conceptual system and stored in long-term memory. Younger students may encounter difficulties at this stage. Therefore, they need to make a conscious effort and apply comprehension strategies; otherwise, comprehension remains incomplete. Teachers can provide support by using materials that help synthesize information, such as graphic organizers.

II.2.3. The multicomponent model of reading comprehension

Tennent (2014) developed a multicomponent model of reading, which emphasizes that text comprehension is the result of the interaction between linguistic processes, knowledge, and (meta)cognitive processes. These components, such as vocabulary understanding, general and

specific knowledge, memory, inferences, and monitoring, work simultaneously to facilitate comprehension. Since all these elements act together, the author did not mark the connections between the elements, but a graphic representation like the one in Figure 3.II. would more clearly highlight the simultaneous action of the components involved in reading.

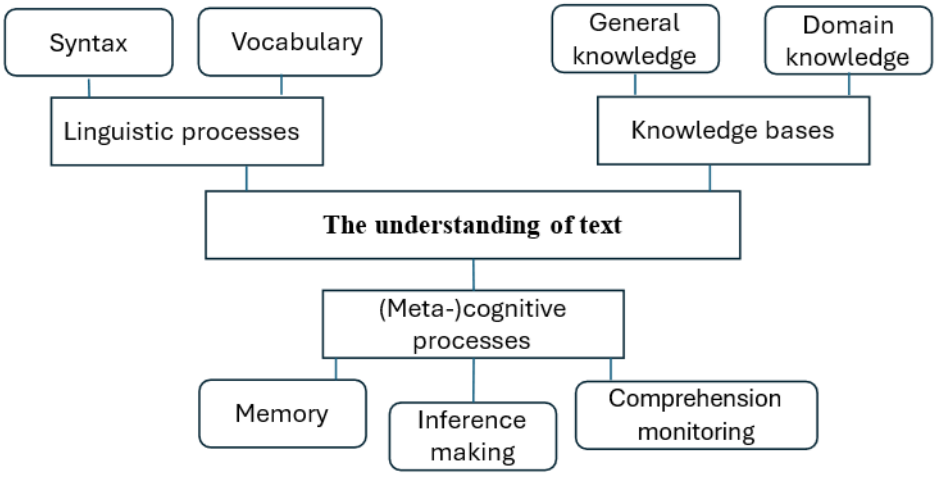

Figure 3.II. The multicomponent model of reading comprehension (adapted from Tennent, 2014)

II.3. The Reader, the Text, the Context - Variables in Reading Comprehension

Reading comprehension is the result of the interaction between the reader, the text, the socio-cultural context, and the reading task (Gaskins, 2005). Depending on the research period, different factors were emphasized, as noted by Pearson & Cervetti (2015): the 1960s were dominated by models that viewed reading as a mechanical decoding process (bottom-up), without involving the reader's mental processes. In the 1970s, with the rise of cognitivism, the focus shifted to the reader and the role of prior knowledge in constructing meaning (top-down). After 1985, research began to emphasize the importance of the socio-cultural context in text interpretation. In the school context, all these factors contribute to text comprehension.

II.3.1. Characteristics of the Reader

In the reading activity, the reader participates with their entire personality, including their cognitive and affective characteristics. Certain cognitive processes, such as linguistic skills (vocabulary, morphological and syntactic awareness, inferences) or executive functions, are significant predictors of reading comprehension (Cain, 2012). As for affective structures, attitudes towards reading, self-confidence as a reader, or motivation for reading are elements that enhance reading comprehension and are closely linked to the text and context.

II.3.2. Types of Texts

Reading performance depends not only on the reader's abilities but also on the characteristics of the text, such as its accessibility and structure. Literary texts, such as narrative ones, and informational texts, like expository texts, have different structures that influence comprehension. Narrative texts are more accessible and familiar to children, while expository texts, with structures like cause-effect or problem-solution, are more difficult, requiring more cognitive resources (Botsas, 2017). Text accessibility involves both cognitive aspects, such as vocabulary and sentence structure, and affective aspects related to the design and presentation of texts, which can either motivate or discourage students in their reading tasks. It is recommended to adapt texts to the students' level to maximize their understanding and interest in reading (Bocoș, 2017).

II.3.3. The Reading Context

Reading comprehension is influenced by the psychological, social, and physical context in which reading takes place. Interest and motivation for reading, as well as the social and physical context, play a crucial role in reading performance. For example, high interest in a subject improves comprehension, while lack of interest can lead to mind-wandering and decreased understanding of the text (Feng, D'Mello, & Graesser, 2013). The social environment, such as interactions with teachers and teaching style, as well as the physical environment, also influence reading performance (Pamfil, 2016). PIRLS studies identify factors associated with high reading performance, including a family environment that supports reading, an early start in reading, and a positive attitude towards reading (Mullis et al., 2017). In conclusion, reading comprehension is a complex process, determined by a favorable interaction between the reader, the text, and the context.

II.4. Assessing Reading Comprehension

Assessing reading comprehension is essential both for determining students' performance levels and for identifying and implementing intervention measures in case of reading difficulties. The evaluation process focuses on two main aspects: what is assessed and with what tools. Differences between disciplinary approaches and the variability of educational tests make it difficult to standardize assessments. Standardized tests, which are more reliable and valid, differentiate better between students than researcher-created tests for specific studies. Various types of items are used to assess comprehension, each involving different cognitive processes. For example, true/false items and multiple-choice questions require different levels of processing and can influence the validity of results. Open-ended questions and response completion tasks provide a clearer perspective on students' comprehension abilities, particularly regarding inferential skills and text processing. In international assessments, selecting images corresponding to the text is a method used to measure comprehension. The types of items can highlight different levels of text processing, from superficial text processing to deeper levels of situational understanding (McNamara et al., 1996).

The international assessment of fourth-grade students' reading literacy, conducted through the PIRLS program (Progress in International Reading Literacy Study), aims to measure reading comprehension at this level, considered essential for the transition to reading for learning (Mullis, Martin, Kennedy, & Trong, 2011). PIRLS assesses both reading for literary experience and for acquiring and using information, using literary and informational texts. PIRLS tests are complex, including multiple-choice and open-ended items, and are designed to assess four key reading processes: retrieving information, drawing conclusions, integrating ideas, and evaluating content. Intermediate-level students should be able to identify and integrate information from the text, make inferences, and evaluate characters' actions and motivations (Mullis & Prendergast, 2017). Those who fail to accomplish these tasks exhibit comprehension difficulties and are at risk of academic failure.

II.5. Determining Factors of Reading Comprehension Difficulties

Failure in text comprehension is common among students with poor decoding skills or learning disorders, but also among those without such diagnoses, who show unexpectedly weak text comprehension abilities, falling into the category of functional illiteracy. In Romania, almost 40% of primary and secondary school students face such difficulties. The causes include deficits in linguistic processing, insufficient knowledge, and poor strategic reading skills (Albulescu, 2020). Studies show that vocabulary and semantic processing are major deficits for these students, and cognitive

processes such as word recognition remain essential for reading comprehension (Li et al., 2018). From the perspective of information processing, Cain (2012) mentions the following five variables as sources associated with comprehension failure: surface representation of the text, integration of information into the situational model, comprehension monitoring, knowledge of text structure, and working memory.

Chapter III. METACOGNITION IN THE READING PROCESS. A MULTIDIMENSIONAL APPROACH

III.1. Defining the Term Metacognition

Borkowski (1996) described the theoretical foundations of metacognition as fragile mini-theories, whose boundaries are so poorly defined that any attempt at empirical or theoretical synthesis is almost impossible (Borkowski, 1996, as cited in McCormick, 2003, p. 82). The most well-known and widely used definition of metacognition is the one by Flavell (1979), which represents "Knowledge about one's own cognitive processes and products, or anything related to them" (Flavell, 1976, p. 232). Reeve and Brown (1985) defined metacognition as "The ability of individuals to understand and manipulate their own cognitive processes" (Reeve & Brown, 1985, p.3), while Jacobs and Paris (1987) stated that metacognition is "Any knowledge about cognitive states and processes that can be shared among individuals... a reportable awareness of the cognitive aspects of thinking" (Jacobs & Paris, 1979, p.258).

Metacognition in reading refers to the awareness of one's thoughts during reading and the ability to monitor one's own thinking (Brown, 2002, as cited in Smith, 2016). Metacognition and comprehension result from the mental ability to make connections and ask questions related to the text.

III.2. Components of Metacognition

Over time, many aspects and concepts specific to metacognition have been modified, refined, with some added and others eliminated.

Flavell (1979) identified four essential components of cognitive monitoring: metacognitive knowledge (about oneself, the task, and strategies), metacognitive experiences (cognitive and affective experiences), cognitive goals or tasks, and the actions or strategies used. The interaction between these components is crucial for managing and adapting cognitive processes. His model

emphasizes the importance of awareness and revising strategies and goals based on the experiences and knowledge gained during the cognitive process.

The taxonomy proposed by Jacobs and Paris (1987) divides metacognition into two main categories: self-evaluation of cognition and self-management of thinking. Self-evaluation of cognition involves the static examination of cognitive processes and includes three sub-components: declarative knowledge (understanding the factors that affect reading), procedural knowledge (knowing how to apply learning strategies), and conditional knowledge (knowing when and why to use certain strategies). Self-management of thinking refers to the active monitoring of thinking and includes planning (choosing strategies), evaluating (analyzing effectiveness), and regulating (adjusting strategies based on progress).

Brown's model (1981, as cited in Tarricone, 2011) identifies two main categories of metacognition: knowledge about cognition and regulation of cognition. Knowledge about cognition includes declarative knowledge (about oneself, tasks, and strategies) and procedural knowledge (about effectively applying strategies). Regulation of cognition involves regulatory skills such as planning, monitoring, and evaluating, which are essential for adapting to various tasks and problems. These skills are developed through conscious reflection and supported by executive functions. The models by Flavell, Brown, and Jacobs and Paris are fundamental in the study of metacognition and continue to influence research in this field.

Researchers have continued to develop and refine metacognitive models, focusing on two major challenges: defining metacognitive categories and operationalizing them. Tarricone (2011) synthesized the main metacognitive models, identifying two main categories: metacognitive knowledge (declarative, procedural, and conditional knowledge) and metacognitive skills (monitoring, control, and self-regulation). Although there are various models depending on the reference field, researchers agree that metacognition primarily includes metacognitive knowledge and skills (Sălăvăstru, 2009).

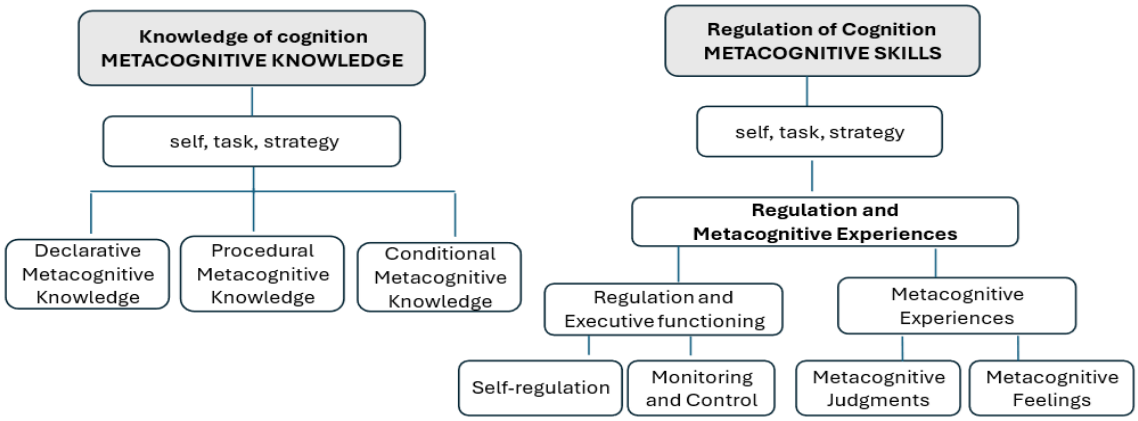

Figure 1.III. The Taxonomy of Metacognition (adapted from Tarricone, 2011)

III.3. Cognition versus Metacognition

Metacognition is a subtype of cognition, meaning cognition about cognition. Studies show that cognitive variables, such as memory and comprehension, are distinct from metacognitive ones, like meta-memory and meta-comprehension. Flavell (1979) differentiated between cognitive strategies, which contribute to the acquisition of knowledge, and metacognitive strategies, which monitor progress in acquiring knowledge. The same strategy can be considered cognitive or metacognitive, depending on the intended goal. The difference between cognitive and metacognitive lies in the nature of the goal: cognitive strategies aim to achieve a cognitive objective, while metacognitive strategies monitor progress in achieving that objective.

III.4. Developmental Milestones in the Evolution of Metacognition

Metacognition in reading develops progressively, and young children are often less aware of reading goals and the strategies needed to address comprehension errors. Recent studies highlight the importance of early assessment of metacognitive knowledge and its relationship to general learning. Research shows that metacognition and reading skills develop simultaneously and that a high level of metacognition at an early age is a predictor of later success in reading and writing (Annevirta et al., 2007; Teng & Zhang, 2021). This effect, similar to the Matthew effect, suggests that children with initial advantages in metacognition and vocabulary tend to progress faster (Teng, 2022). Studies emphasize the need for early intervention to prevent metacognitive gaps that could hinder the

harmonious development of children's personalities. Teaching cognitive knowledge should be accompanied by guiding students toward reflecting on strategies to overcome learning obstacles.

III.5. Methods for Assessing Metacognition in Reading

Investigating metacognition in reading, especially in young children, is complex and challenging, requiring sophisticated methods to objectify and measure the internal processes involved. Assessment methods are divided into two main categories: off-line measurements, outside the reading context (questionnaires, scales, interviews), and on-line measurements, within the reading context (think-aloud protocol, error detection, self-assessment of performance, computerized methods).

Off-line methods rely on retrospective statements from subjects and offer advantages such as ease of application and objective scoring, but they may be limited by responses influenced by memory or social desirability (Cobb, 2016). Interviews, though more detailed and personalized, are time-consuming and difficult to use with large groups, but they provide valuable information for designing individualized learning (Israel, 2007).

On-line methods, such as the think-aloud protocol, where students verbalize metacognitive strategies in real-time, provide valuable data but are also time-consuming (Pressley & Afflerbach, 1995). Other methods include error detection and self-assessment of performance, which measure monitoring and metacognitive control abilities. Performance tests, such as highlighting errors once identified, verbal reports, eye movements, rereadings, or glances back, have been used to determine error detection ability. These tests have limitations related to ecological validity, the readers' purpose, how they were informed, or the type of errors they identify (Baker & Cerro, 2000). Self-assessment tasks include confidence judgments about performance levels and can be applied before, during, and after completing the task (Terneusen et al., 2024). Discrepancies between subjects' prospective or retrospective anticipations and actual scores can indicate the accuracy of performance judgments and metacognitive sensitivity (Fleming & Lau, 2014).

Each method has advantages and disadvantages, but together they provide a clearer picture of metacognition in reading, essential for developing students' skills.

III.6. Characteristics of Strategic Readers

Metacognitive reading strategies are deliberate, goal-oriented behaviors used to monitor and regulate text comprehension (Salataki & Akyel, 2002, as cited in Ahmadi et al., 2013). Skilled readers are more strategic and able to recognize and correct misunderstandings during reading,

unlike weaker readers who struggle to detect errors and do not initiate repair strategies. Efficient readers set goals before reading, check understanding during reading, and review information after reading (Reutzel et al., 2002). Metacognitive strategies can be taught and contribute to improving reading skills, positively influencing students' performance.

III.7. Metacognitive Strategies for Improving Reading Comprehension

In recent decades, strategy-based instruction has become central to learning and understanding written texts, based on the idea that reading comprehension strategies can be taught until they become automatic. Good readers consciously apply repair strategies to overcome comprehension difficulties, while weak readers do not, either due to a lack of knowledge or an inability to recognize comprehension problems. Comprehension strategies involve both cognitive and metacognitive processes, but distinguishing between them is often difficult (Klingner, Morrison, & Eppolito, 2013; Williams & Atkins, 2009). The National Reading Panel in England identified seven essential strategies for improving comprehension in primary school students, including monitoring comprehension, using graphic organizers, generating questions, and summarizing (Shanahan, 2005). Other effective strategies include activating prior knowledge, clarification, prediction, and visualization.

Activating Prior Knowledge. Activating prior knowledge involves students accessing and sharing what they already know about a particular topic to integrate new information into pre-existing knowledge. This practice helps organize and understand new information, but it can have a negative effect if the new information conflicts with existing knowledge, creating conceptual dissonance (Campbell & Campbell, 2009). Strategies for activating prior knowledge can either reinforce existing schemas or help build new knowledge.

Metacognitive Schemas Based on Text Structure. Text structure plays an important role in facilitating comprehension and memory of information. Students develop cognitive schemas about the structure of texts, which help them organize and recall information. Narrative structure, which includes elements such as location, theme, plot, and resolution, and the structure of informational texts (description, sequencing, cause-effect, problem-solution, compare-contrast) are essential for comprehension. Studies show that instructional strategies that include teaching these structures improve text comprehension in primary school students (Cazacu, 2012; Hebert et al., 2016; Meyer & Ray, 2011; Pyle et al., 2017), including preschoolers (Culatta, Hall-Kenyon, & Black, 2010).

Graphic Organizers. Graphic organizers are visual tools that help students understand and organize information from texts, facilitating metacognition. Examples include Venn diagrams, causal

matrices, and concept maps. These organizers contribute to creating a coherent mental model and can be used before, during, and after reading to activate prior knowledge and clarify relationships between concepts. Studies show that using graphic organizers significantly improves text comprehension, including for students with learning difficulties (Williams et al., 2007).

Prediction. Prediction is a reading strategy that involves anticipating the content of the text based on clues from the title, subtitles, images, or the readers' previous experiences. As they read, students confirm or modify their predictions, which helps increase comprehension and maintain interest and motivation for reading. The strategy can be implemented using a five-step method, which includes preparing the material, marking stopping points, reviewing and arguing the predictions, reading the text, and reviewing the predictions (Farrell, 2002). Predictions are not necessarily right or wrong but should be related to the theme of the text, and students are encouraged to actively participate, even when they encounter difficulties. This strategy can be adapted for younger children through prediction exercises in the form of games or worksheets.

Questioning. Questioning is a reading strategy that improves awareness of key ideas in the text by formulating relevant questions. This involves processing the material and focusing on information that answers the questions posed, using introductory words such as who, what, when, where, why, how, or if. It is important for the questions to be meaningful and aimed at a deep understanding of the text (Conley, 2019). Suggested methods include guessing test questions, turning sentences into questions, and using texts with interrogative titles. Questioning can also be applied as an interactive teaching method, where students formulate and discuss questions generated by a given sentence (Fisher, 2021).

Conceptual Clarification. Clarifying unknown words, expressions, or concepts is essential for text comprehension, especially when they contain key information. Clarification can be done using context, dictionaries, or consulting an expert. This is related to comprehension monitoring, as students need to recognize when they do not understand a word. The method is fundamental in traditional education, but there are no studies isolating it as a metacognitive strategy. However, clarification is frequently used and preferred by primary school students (Klingner, Vaughn, & Schumm, 1998). Tests have shown that explaining words before reading is not always effective.

Visualization. Visualization, as a metacognitive reading strategy, involves students forming mental images while reading to improve text comprehension. This method helps students differentiate between reading for decoding and reading for understanding, facilitating the construction of a mental model of the text. Visualization training can begin with simple sentences and progress to more complex ones. Studies, such as Zimmerman's (2003), have shown that

visualization techniques significantly improve comprehension and storytelling skills in first-grade students.

Monitoring. Monitoring during reading involves awareness of text comprehension and taking action when the meaning is unclear. Studies, such as those by Kinnunen & Vauras (1995) and Hoffman (2010), have highlighted that weaker readers have difficulty monitoring comprehension. Educational interventions focused on metacognitive monitoring, sometimes combined with the use of graphic organizers, have demonstrated significant improvements in text comprehension among primary school students.

Summarizing. Summarizing the text involves extracting the main ideas and organizing them into a coherent summary. There are two major strategies for teaching summarization: rule-based and text-structure-based. Strategies include categorizing elements, eliminating repetitive information, selecting and formulating main sentences, and removing unimportant details (Jitendra & Meenakshi, 2013). Studies have shown that these strategies significantly improve comprehension, especially for expository texts. For example, students trained using the rule-based method demonstrated better summarization and comprehension skills, even those with reading difficulties (Braxton, 2009).

III.8. Educational Programs for Developing Reading through Metacognitive Strategies

Positive evidence regarding the effectiveness of metacognitive instruction in reading has contributed to the development of strategy-based instructional programs. In the classroom, rarely is a single strategy implemented on its own. Only by learning a "package" of flexible strategies can students become aware of using them in specific situations. Most programs explicitly model the strategies and then guide their use, gradually reducing the teacher's participation.

Among the mentioned programs are ISL – *Informed Strategies for Learning* (Paris, Cross, & Lipson, 1984), which teaches students about metacognitive strategies through explicit instruction, RT – *Reciprocal Teaching* (Palincsar and Brown, 1984), which uses dialogue to teach four key strategies: summarizing, question generation, clarification, and prediction, and TSI – *Transactional Strategies Instruction* (Brown, Pressley, Van Meter, & Schuder, 1996), which combines multiple strategies and collaborative discussions. Other programs, such as CSR – *Collaborative Strategic Reading*, focus on collaborative strategic reading. Vianin (2011) proposed the *Strategic Reading Assistance* program, which targets specific instruction for students with learning difficulties. In conclusion, the success of these programs varies depending on the context, and the effectiveness of the strategies may depend on the students' age and level.

III.9. Explicit Teaching of Metacognitive Reading Strategies in the School Context

In the field of metacognitive instruction, a distinction must be made between teaching strategies and comprehension strategies. The latter refers to deliberate actions taken by the student to increase understanding and retention of information, while teaching strategies are actions used by the teacher to guide the formation of comprehensive strategies (Shanahan, 2005). Studies show that metacognitive interventions implemented by researchers have been more effective than those carried out by teachers (Solis et al., 2011), but a possible solution could be the gradual transfer of responsibility to teachers (Bruce & Robinson, 2000).

In the teaching of metacognitive strategies, a gradual release of responsibility model is followed, where the teacher demonstrates the strategies, assists students in practice, and finally, students apply the strategies independently. Despite the tradition of introducing metacognition later in education, studies show that metacognitive instruction can be effective even at younger ages, including in kindergarten.

In conclusion, teaching metacognition requires competence and preparation from teachers, who must themselves be metacognitive. It is essential that pedagogy values self-reflection and self-regulation to improve both students' comprehension and the efficiency of the learning process (Bocoș, 2013).

CHAPTER V. STUDY 1. AWARENESS OF TEACHING PRACTICES FOR METACOGNITIVE READING STRATEGIES AMONG PRIMARY SCHOOL TEACHERS. A DESCRIPTIVE AND CORRELATIONAL STUDY

V.1. Introduction

In a world where access to information is ubiquitous, the competence to deeply understand written texts is essential. The factors influencing this ability are related to students' level of knowledge, the structure of the text, and the educational context. School programs include educational activities aimed at developing metacognitive strategies, but their effectiveness depends on how teachers teach them. Monitoring comprehension strategies, known as metacognitive strategies, are not "visible," often being automatic and unconscious. However, several studies have shown that these strategies can be taught and learned from a young age, leading to a deep understanding of the meaning of information (Eilers & Pinkley, 2006). Therefore, a primary objective of this study is to explore to what extent metacognitive reading strategies are consciously recognized and/or used in the teaching activities of primary school teachers.
To develop metacognitive skills, teachers must themselves possess these skills in order to regulate

and monitor their own teaching activities (Kallio et al., 2017). The second objective of the study is to investigate the relationship between the teaching practices of metacognitive reading strategies and the general metacognitive awareness of teaching among primary school teachers. The results of this investigation can benefit primary school teachers and professional development providers by promoting the metacognitive aspect of teaching instruction.

V.2. Research Problem

Difficulties in text comprehension are an important predictor of school failure, influenced by students' metacognitive skills and the teaching strategies used by teachers. This study aims to explore whether primary school teachers are aware of the importance of teaching metacognitive strategies and whether they integrate these strategies into classroom reading activities. Additionally, the research seeks to identify the factors influencing the teaching of metacognition and reading strategies in order to better understand teachers' training needs and propose possible educational interventions. The study raises two main questions: whether teachers are aware of practices that promote metacognitive reading strategies and whether those teachers who are aware of their own metacognitive strategies tend to encourage their development more in students. In Figure 1.V., the conceptual map of the research problem and the research hypotheses stemming from the research questions are presented.

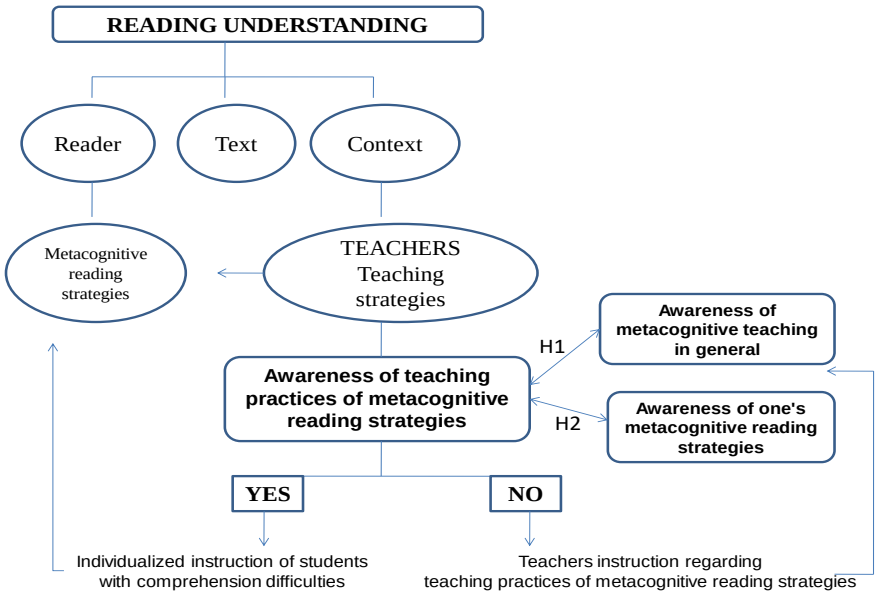

Figure 1.V. Conceptual Map of the Research Problem and Hypotheses (Study 1)

V.3. Research Objectives and Hypotheses

Objective 1: To develop a tool to measure the awareness of teaching practices for metacognitive reading strategies among primary school teachers.

Objective 2: To investigate the teaching practices of metacognitive reading strategies by primary school teachers.

Objective 3: To explore the associations between the awareness of teaching practices for metacognitive reading strategies, general metacognitive teaching awareness, and awareness of teachers' own metacognitive reading strategies in primary school teachers.

Research Hypotheses:

Hypothesis 1. Among primary school teachers, there is a positive correlation between the awareness of teaching practices for metacognitive reading strategies and the general metacognitive awareness of teaching activities.

Hypothesis 2. Among primary school teachers, there is a positive correlation between the awareness of teaching practices for metacognitive reading strategies and the awareness of their own metacognitive reading strategies.

V.4. Research Methodology

V.4.1. Participant Sample

The sample consists of 70 primary school teachers with teaching experience ranging from 1 to 40 years (M = 21.32 years). Of these, 9 are male and 61 are female. Regarding their education level, over 45% have a master's degree, and more than 70% hold the first teaching degree (the highest professional qualification in education). The subjects teach in both rural (N=22) and urban areas (N=60).

V.4.2. Investigation Tools

In this study, three self-report instruments were applied:

(1) Awareness of Teaching Practices Regarding Metacognitive Reading Strategies – PPSCM (self-designed);

(2) Metacognitive Awareness Inventory for Teachers – MAIT (Balcikanli, 2011);

(3) Metacognitive Awareness of Reading Strategies Inventory – MARSI (Mokhtari and Reichard, 2002).

V.4.3. Investigation Procedure

In the first phase of the research, a pilot study was conducted to ensure the clarity of the questions in the translated questionnaires, applied to a group of 8 primary school teachers. After reviewing and adjusting the questions, the final sample of subjects was randomly selected, in collaboration with speech therapists and itinerant teachers. Participation in the study was voluntary and anonymous, and data were collected through self-administered questionnaires. Out of 100 distributed questionnaires, 70% were fully completed.

V.5. Research Results

Data processing, following the administration of the questionnaires, was conducted using IBM SPSS Statistics 20.0 for Windows.

Descriptive Analyses

In this study, the research method used was a survey based on a questionnaire. The subjects completed three questionnaires: PPSCM, MAIT, and MARSI. Below are the results for each scale and variable.

a. Analysis of Awareness of Teaching Practices for Metacognitive Reading Strategies (PPSCM Scores)

In this questionnaire, subjects were asked to indicate the extent to which they instruct students to become aware of using metacognitive strategies when reading a text for the first time. Responses were rated on a scale from 1 to 5, with a higher score indicating a higher frequency of teaching the respective strategy.

The overall mean score obtained was M=4.04 (SD=.52), corresponding to the response "I usually do this," which indicates a high level of teaching practices for metacognitive reading strategies. The item averages highlight that the least frequently practiced strategies are part of the "before reading" stage, with subjects stating that they "sometimes" instruct students to analyze the length and structure of the text (M=3.08). Other less frequently used practices include teaching the strategy of making predictions during the reading of the text: M=3.39 for the item "Check if they have made new predictions about the text based on the information found," and M=3.42 for the item "Stop and check if the prediction made before reading the text has come true." At the opposite end, the item with the highest value was "Ask for help if they did not understand" (M=4.76), indicating frequent use of this strategy across the sample. Other high-value strategies include vocabulary understanding checks (M=4.69) and summarization (M=4.55).

The descriptive analysis for the stages of first-time reading activities (Figure 2.V.) indicates that the highest value is for teaching post-reading strategies (M=4.16), followed by teaching during-reading strategies (M=4.07), and pre-reading strategies (M=3.82).

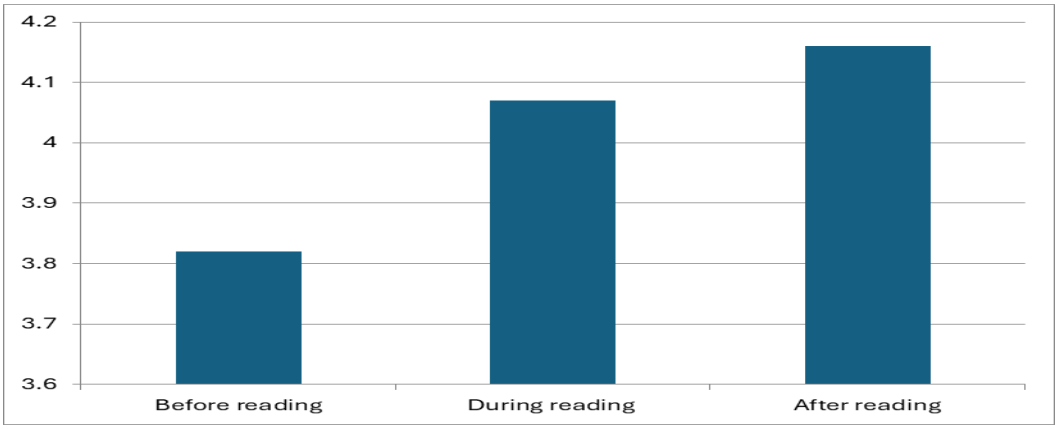

Figure 2.V. Level of Awareness in Teaching Metacognitive Reading Comprehension Strategies

b. Analysis of Metacognitive Teaching Awareness (MAIT Scores)

In this questionnaire, subjects responded on a scale from 1 (strongly disagree) to 5 (strongly agree) about the extent to which they are aware of how they conduct their teaching activities. The obtained scores were coded according to the response scale, with data ranging between 1 and 5. Regarding metacognitive awareness of teaching (MAIT scores), the descriptive analysis indicated a high level of metacognitive teaching awareness both globally (M=4.42) and across the six dimensions. The lowest average among factors was for *Evaluation of teaching* (M=4.16), indicating a lower use of this strategy compared to *Monitoring* (M=4.33). *Teaching planning* (M=4.59) was the factor with the highest average, suggesting a frequent use of this strategy (Figure 3.V).

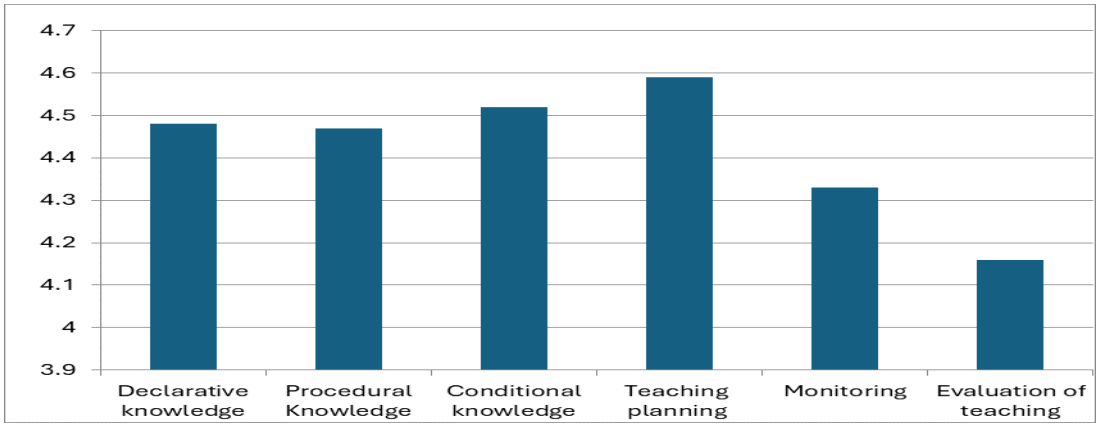

Figure 3.V. Level of Metacognitive Awareness in Teaching Activities Among Primary School Teachers

c. Analysis of Metacognitive Awareness of Reading Strategies (MARSI Scores)

In this questionnaire, subjects responded on a scale from 1 (never or almost never) to 5 (always or almost always) about the extent to which they are aware of using reading strategies when they themselves read academic materials. The obtained scores were coded according to the response scale, with data ranging between 1 and 5. In Table 3.V., descriptive indicators for responses to the MARSI scale, the overall average, and the averages for the factors are presented.

Table 3.V. Average Values for the Awareness of Teachers' Use of Their Own Reading Strategies (Factors and Overall Score)

Subscales	**Minimum**	**Maximum**	**Mean**	**SD**
Global reading strategies	1.77	5.00	3.47	.69
Problem solving strategies	2.13	5.00	3.88	.73
Support strategies	1.56	5.00	3.34	.75
MARSI	1.83	5.00	**3.54**	.65

Regarding the awareness of their own reading strategies, the descriptive analysis indicated a moderate level of metacognitive awareness of their own reading strategies (M=3.54), which corresponds to the response "I sometimes do this." The highest average was for the *Problem-solving strategies* factor (M=3.88), followed by *Global reading strategies* (M=3.47) and *Support strategies* (M=3.34).

Inferential Analysis

Verification of Hypothesis 1 (H1):

To verify whether there is a significant correlation between the awareness of teaching practices for metacognitive reading strategies and the general metacognitive awareness of teaching activities, the Pearson correlation coefficient (r) was calculated. The condition of normal data distribution was checked using the Kolmogorov-Smirnov test, which indicated a normal distribution of the data for all measured variables ($p>0.050$).

Table 4.V. Correlations Between the Awareness of Teaching Practices for Metacognitive Reading Strategies (PPSCM Scores) and the General Metacognitive Awareness of Teaching Activities (MAIT Scores)

Factors	**Awareness of teaching practices of metacognitive reading strategies (PPSCM)**
Declarative knowledge	383**
Procedural Knowledge	.569**
Conditional knowledge	.484**
Planning	.435**
Monitoring	.469**
Evaluation	368**
MAIT	.611**

According to the results obtained, there is a significant positive correlation at a significance level of p<0.010 between PPSCM and MAIT scores (r=.611**, p<0.010) and all the factors of the MAIT scale. This indicates that, among primary school teachers, teaching metacognitive reading strategies is positively associated with general metacognitive awareness of teaching. The MAIT factor that correlates most strongly with PPSCM is *Procedural Knowledge* (r=.569**, p<0.010), while the least correlated factor is *Planning* (r=.368**, p<0.010).

Since this is a cross-sectional study and we cannot determine a causal relationship, an attempt was made to create a predictive model based on a regression equation to identify the MAIT factor with the highest potential to predict the teaching of metacognitive strategies to students. The MAIT factors were introduced into the analysis as predictors, while PPSCM scores were used as the dependent variable. The results of the regression analysis are presented in Table 5.V.

Table 5.V. Regression Coefficients for Estimating the Teaching of Metacognitive Reading Strategies Based on Metacognitive Awareness of One's Own Teaching Activities

Variables	**B**	**Std. Error**	**Beta**	**t**	**Sig.**
Declarative knowledge	.110	.134	.102	.818	.416
Procedural Knowledge	.367	.150	**.325**	2.453	**.017**
Conditional knowledge	.150	.181	.118	.827	.411
Planning	.082	.129	.078	.637	.526
Monitoring	.252	.129	**.295**	1.949	**.056**
Evaluation	-.069	.119	-.087	-.583	.562
MAIT total	**R^2 =.421**				

The results obtained from the regression analysis show that the factors included in the regression equation (in the model) explain 42.1% of the variation in the results obtained (R^2=0.421), with the remaining 57.9% of the variation explained by other factors not included in the model. Following the regression analysis, we obtained the unstandardized coefficient values, standardized coefficient values, the t-test value, and the significance level for each factor introduced into the model. Reference values were set at significance levels of 0.01 and 0.05, but significance levels close to 0.05 are also discussed.

By analyzing the results presented in the table, we identified which factors significantly contribute to the prediction of PPSCM. The t-test indicates that among all the factors, the only one that significantly contributes to the outcome (PPSCM) is *Procedural Knowledge* (β = .339, p=.017). This means that the higher the value of *Procedural Knowledge*, the higher the PPSCM level. There is also a trend for *Monitoring* to be a predictor of PPSCM (β = .295, p=.056), but the significance level is >0.050.

Verification of Hypothesis 2 (H2):

To verify whether there is a significant correlation between the awareness of teaching practices for metacognitive reading strategies and the metacognitive awareness of one's own reading strategies, the Pearson correlation coefficient (r) was calculated. The normality of the data distribution was checked using the Kolmogorov-Smirnov test, which indicated a normal distribution of the data for all measured variables (p>0.050).

Table 6.V. Correlations Between Awareness of Teaching Practices for Metacognitive Reading Strategies (PPSCM Scores) and Metacognitive Awareness of One's Own Reading Strategies (MARSI Scores)

Subscales	**Awareness of teaching practices of metacognitive reading strategies (PPSCM)**
Global reading strategies	.506**
Problem solving strategies	.306*
Support strategies	363**
MARSI total	**.451****

According to the results obtained, there is a significant positive correlation between PPSCM and MARSI scores (r=.451**, p<0.010) and the three factors of the MARSI scale. This indicates

that, among primary school teachers, the teaching of metacognitive reading strategies is positively associated with the metacognitive awareness of their own reading strategies. The MARSI factor that correlates most strongly with PPSCM is the use of *Global Reading Strategies* (r=.506**, p<0.010), while the least correlated is the use of *Problem-Solving Strategies* (r=.306*, p<0.050). Since this is a cross-sectional study and we cannot determine a causal relationship, an attempt was made to create a predictive model based on a regression equation to identify the MARSI factor with the highest potential to predict the teaching of metacognitive strategies to students. The MARSI factors were introduced into the analysis as predictors, while PPSCM scores were used as the dependent variable. The results of the regression analysis are presented in Table 7.V.

Table 7.V. Regression Coefficients for Estimating the Teaching of Metacognitive Reading Strategies Based on Metacognitive Awareness of One's Own Reading Activities

Variable	B	Std. Error	Beta	t	Sig.
Global reading strategies	.441	.152	**.565**	2.894	**.006**
Problem solving strategies	-.036	.126	-.049	-.289	.773
Support strategies	-.024	.139	-.034	-.176	.861
MAIT total	**R pătrat =.259**				

The results obtained from the regression equation show that the factors included in the regression equation (in the model) explain 25.9% of the variation in the results obtained (R^2=0.259), with the remaining 74.1% of the variation being explained by other factors not included in the model. Following the statistical analysis, we obtained the unstandardized coefficient values, standardized coefficient values, the t-test value, and the significance level for each factor introduced into the model. The reference values were set at significance levels of 0.01 and 0.05, but significance levels close to 0.05 are also discussed.

By analyzing the results presented in the table, we identified which factors significantly contribute to the prediction of PPSCM. The t-test indicates that, among all the factors, the only one that significantly contributes to the outcome (PPSCM) is *Global Reading Strategies* (β = .565, p=.006). This could mean that the higher the value of *Global Reading Strategies*, the higher the PPSCM level.

The regression analyses show that MAIT is a better predictor of PPSCM than MARSI. To test how they act together, i.e., when MAIT is controlled, a multiple regression analysis was performed. In the first model, MAIT was introduced as a predictor, and in the second model, both MAIT and MARSI were introduced.

Table 8.V. Multiple Regression Analysis for Estimating the Teaching of Metacognitive Reading Strategies Based on MAIT and MARSI

	Variable	R square		Std. Erroar	B	t	Sig.
Model 1	(MAIT)	.361	.856	.155	.601	5.526	.000
Model 2	(MAIT)	.415	.713	.163	.501	4.377	.000
	(MARSI)		.211	.095	.253	2.212	.031

The results obtained from the regression analysis (Table 8.V) show that, together, the factors included in the regression equation from model 2 (MAIT and MARSI) explain 41.5% of the variation in the results obtained (R^2=0.415), with the remaining 59.5% of the variation being explained by other factors not included in the model. However, when MAIT is controlled, MARSI predicts 5.4% of the variation in PPSCM (Figure 5.V).

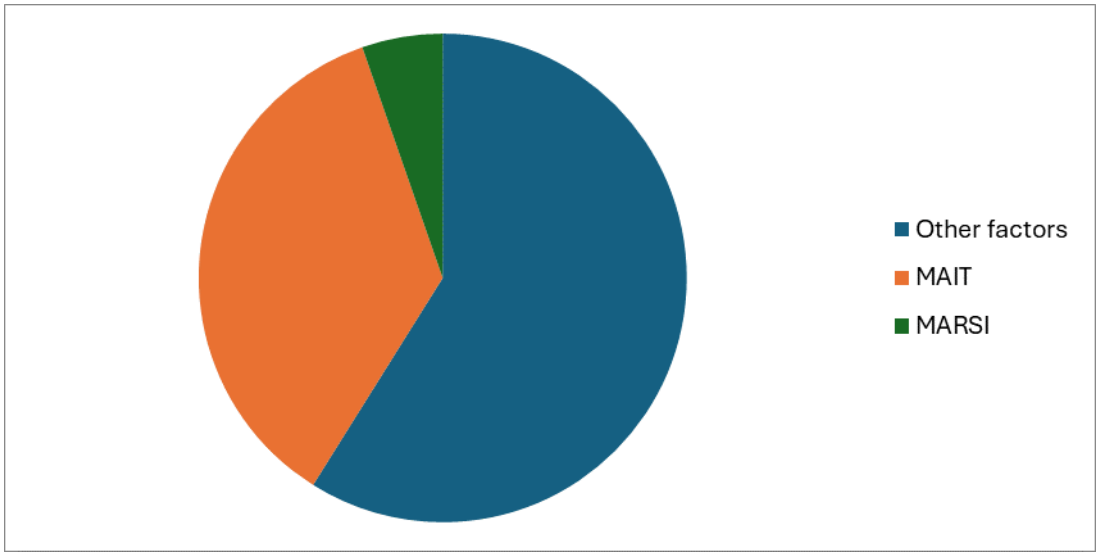

Figure 5.V. Predictive Model of Awareness in Metacognitive Reading Instruction Based on MAIT and MARSI.

V.6. Conclusions

The present study aimed to investigate the teaching practices of metacognitive reading strategies among primary school teachers and their relationship with metacognitive teaching awareness and awareness of their own reading strategies. The results showed that teachers frequently use metacognitive teaching strategies after reading a text, but less so before and during reading. Additionally, the general metacognitive awareness of teaching is high, but the personal application of

metacognitive reading strategies is lower. The overall conclusion is that to improve the teaching of metacognitive reading strategies, it would be more effective to emphasize general metacognitive teaching awareness among teachers.

In relation to the goal of this study, the conclusion is that an intervention targeting teachers to facilitate metacognitive reading techniques for students is unlikely to significantly improve students' comprehension skills, as teachers reported frequently using these techniques, except for the metacognitive strategies applied before reading. Of course, only direct classroom observation would turn these results into certainty, as the survey method used here has certain limitations, such as the desirability of the respondents' answers. Moreover, evaluating metacognition based on self-reports is often criticized because metacognitive behavior is not always directly observable (Craig et al., 2020). Therefore, it is important to further investigate whether, and to what extent, primary school students have internalized and are using metacognitive strategies for understanding the texts they read, strategies that the teachers in this study sample reported explicitly teaching.

CHAPTER VI. STUDY 2: THE RELATIONSHIP BETWEEN METACOGNITION AND READING COMPREHENSION AMONG PRIMARY SCHOOL STUDENTS. DESCRIPTIVE AND CORRELATIONAL STUDIES

VI.1 Study 2.a. The Relationship Between Awareness of Metacognitive Reading Strategies, Attitude Toward Reading, Self-Concept as a Reader, and Reading Comprehension

VI.1.1. Introduction

Reading comprehension is a complex process that involves the interaction between the reader, text, and context. Reading encompasses both decoding and comprehension, both of which are essential for a complete reading experience. Although school programs in the past have focused more on decoding and oral comprehension, recent changes in education, motivated by poor results in international tests like PIRLS and PISA, have brought more focus on the development of written text comprehension. Skilled readers use specific strategies to understand and use information from texts, and these strategies can be taught to primary school students. Additionally, there is an important link between cognitive, metacognitive, and affective-motivational resources that influence motivation and success in reading, aspects that require further research, especially in the Romanian educational context.

VI.1.2. Research Problem

Reading comprehension is a complex construct that can be analyzed from multiple perspectives, being influenced by the triad of reader-text-context. Although the context and texts are important, reader-related variables play a crucial role. Study 1 highlighted a high level of teacher awareness of teaching practices that promote the development of metacognition in reading for students. The research question follows a natural logic: if classroom teaching facilitates metacognitive awareness in reading among students, then this level should be high. Therefore, the first research question is: Do primary school students become aware of metacognitive reading strategies, and if so, what is the relationship between metacognition and written text comprehension?

In any school task, the student engages with their whole personality. Examining the connection between affective-motivational structures, such as attitude toward reading and perception of reading ability, and cognitive and metacognitive structures may suggest a more comprehensive instructional design model for reading comprehension. Therefore, the second research question of this study is: Are affective-motivational structures, such as attitude toward reading and perception of reading ability, related to the cognitive and metacognitive structures of reading among primary school students?

The research questions and the hypotheses that naturally arise from them are graphically represented in Figure 1.VI. As seen in the conceptual map of the research problem, we expect reading comprehension to be related to metacognitive strategies and affective-motivational components, and for there to be an associative relationship between these three elements.

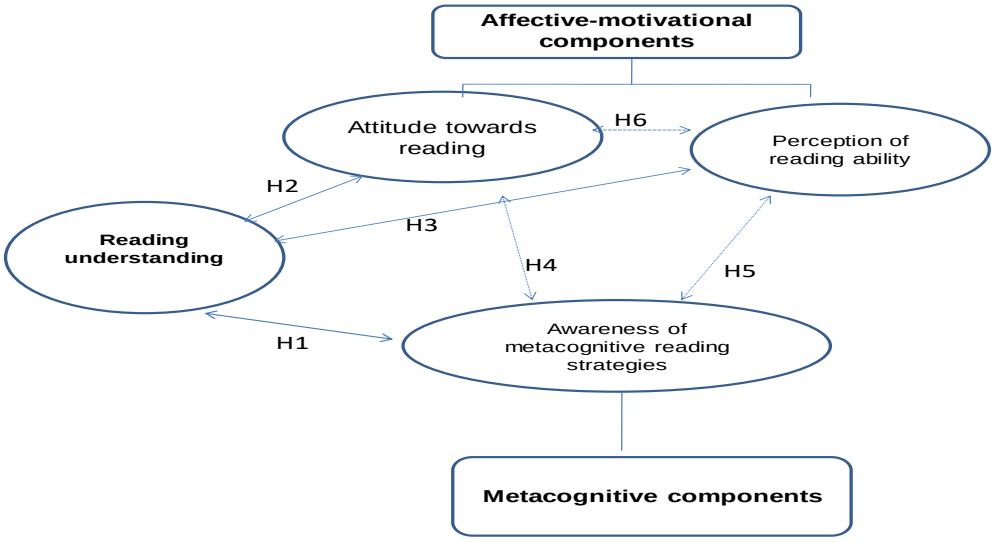

Figure 1.VI. Conceptual Map of the Research Problem and Hypotheses (Study 2a)

VI.1.3. Research Objectives and Hypotheses

Research Objectives

Objective 1: Investigate the level of awareness of metacognitive reading strategies, attitude towards reading, and perception of reading ability among fourth-grade students.

Objective 2: Investigate the associative relationships between the awareness of metacognitive reading strategies, attitude towards reading, perception of reading ability, and written text comprehension in fourth-grade students.

Research Hypotheses

Hypothesis 1. There is a positive relationship between the awareness of metacognitive reading strategies and written text comprehension among fourth-grade students.

Hypothesis 2. There is a positive relationship between attitude towards reading and reading comprehension among fourth-grade students.

Hypothesis 3. There is a positive relationship between perception of reading ability and written text comprehension among fourth-grade students.

Hypothesis 4. There is a positive relationship between the awareness of metacognitive reading strategies and attitude towards reading among fourth-grade students.

Hypothesis 5. There is a positive relationship between the awareness of metacognitive reading strategies and the perception of reading ability among fourth-grade students.

Hypothesis 6. There is a positive relationship between attitude towards reading and perception of reading ability among fourth-grade students.

VI.1.4. Research Methodology

VI.1.4.1. Participant Sample

This study included 85 fourth-grade students from two schools in the city of Arad. The schools are considered mid-level, located in non-central areas of the city. Regarding gender, 45 of the subjects are boys and 40 are girls. No students with Special Educational Needs Certificates or other diagnosed disabilities were included. No specific sampling method was used; all students who were present during testing and whose parents gave consent were included in the study.

VI.1.4.2. Research Instruments

1. Metacomprehension Strategy Index (MSI): The MSI, created by Schmitt (1990), is a questionnaire designed to measure awareness of metacognitive strategies used for comprehending narrative texts, applicable to students in grades 3-8. The questionnaire consists of 25 multiple-choice items organized into three sections corresponding to reading stages: before, during, and after reading. MSI evaluates strategies such as prediction, previewing, goal-setting, self-questioning, activating prior knowledge, summarizing, and applying repair strategies, with specific items for each strategy.

2. Elementary Reading Attitude Survey (ERAS): Attitude towards reading was assessed using The Elementary Reading Attitude Survey (ERAS) by McKenna & Kear (1990), which contains 20 questions measuring recreational and academic reading. Each question is accompanied by emoticons representing different emotional states, and students choose the emoticon that best reflects their feelings. Responses are rated on a Likert scale from 1 to 4, resulting in an overall reading attitude score between 20 and 80. ERAS has demonstrated good internal consistency, with alpha coefficients between .74 and .89, and in this study, alpha coefficients ranged between .84 and .92.

3. Perception of Reading Ability (Appendix 6): The perception of reading ability was measured through three items adapted from Eccles, O'Neill, & Wigfield's scale (2005), which asked students to self-assess their general reading ability and compare themselves with their peers in terms of reading and comprehension. Responses are rated on a scale from 1 to 7, with a total score between 3 and 21, where a higher score indicates a more positive perception of reading ability. The instrument has acceptable internal consistency, with an alpha coefficient of .76.

4. Written Text Comprehension: Written text comprehension was assessed using the students' scores on the 2019 National Assessment at the end of fourth grade. The assessment involved reading a narrative text of approximately 770 words, followed by 12 questions testing four fundamental competencies: extracting explicit information (4 items), working with main ideas (2 items), drawing direct conclusions (4 items), and interpreting and integrating ideas and information (2 items). Two versions of the test were distributed, with slight differences in the plot and characters. The total score could range between 0 and 24 points, with a higher score indicating better performance.

VI.1.4.3. Investigation Procedure

The investigation procedure included several stages: selecting and translating the evaluation instruments, testing them on a small sample of students to check the understanding of terms,

obtaining the necessary consent from schools and parents, administering the questionnaires, and collecting the results from the National Assessment in Romanian Language. The questionnaires were administered in a group setting, with an average duration of 40 minutes, and the experimenter provided additional explanations after reading each sample item. The questionnaires were administered two weeks after the National Assessment.

VI.1.5. Research Results

The data obtained from the questionnaires were processed using IBM SPSS Statistics 20.0 for Windows.

Descriptive Analyses

The subjects individually responded to three measures: the Metacomprehension Strategy Index (MSI), Reading Attitude (ERAS), and Perception of Reading Ability. In addition, their scores from the National Assessment reading comprehension test were considered. The results for each scale and subscale are presented: minimum and maximum scores, mean, standard deviation, and the level at which the subjects are situated.

Table 2.VI. Average Values for the Awareness of Metacognitive Strategies, Reading Attitude, Perception of Reading Ability, and Comprehension Performance (Minimum and Maximum Values, Mean, Standard Deviation, and Level)

	Min	**Max**	**Mean**	**SD**	**Level**
Metacomprehension Strategy Index (MSI)	1.00	21.00 (25)	8.12	4.18	Low
MSI- Before reading	1.00	9.00 (10)	3.47	1.87	Low
MSI- During reading	.00	7.00 (10)	2.75	1.81	Low
MSI- After reading	.00	5.00 (5)	1.9	1.34	Low
MSI- predicting and verifying	.00	6.00 (7)	1.78	1.59	Low
MSI- previewing	.00	2.00 (2)	1.24	.60	High
MSI- purpose setting	.00	3.00 (3)	.78	.89	Low
MSI- self-questioning	.00	3.00 (3)	.88	.90	Low
MSI- drawing from background knowledge	.00	6.00 (6)	2.14	1.37	Low
MSI- summarizing and applying fix-up strategies	.00	4.00(4)	1.28	1.03	Low

Attitude toward reading	28.00	77.00	55.48	12.56	Average
Attitude toward recreational reading	11.00	40.00	27.53	7.25	Average
Attitude toward academic reading	11.00	38.00	27.77	6.27	Average
Perception of one's own reading ability	11.00	21.00	16.68	2.62	Average-high
Comprehension performance (National state Romanian language evaluation)	14.00	24.00	22	2.19	High

Descriptive Analysis

The descriptive analysis indicates high reading comprehension performance (M=22), but a generally low level of awareness of metacognitive strategies (M=8.12 out of a possible 25). In terms of reading phases, the highest MSI score is for strategies used after reading (M=1.9 out of a maximum of 5). Following this, in order, are the use of metacomprehension strategies before reading (M=3.47 out of a maximum of 10) and during reading (M=2.75 out of a maximum of 10). Regarding the preference for types of metacognitive strategies, the highest score was for MSI - Previewing (M=1.24 out of a maximum of 2). In second and third place, although at lower levels, were MSI - Activating Prior Knowledge (M=2.14 out of a maximum of 6) and MSI - Summarizing and Applying Repair Strategies (M=1.28 out of a maximum of 4). Following in descending order are MSI - Self-Questioning (M=.88/3), MSI - Setting Goals (M=.78/3), and MSI - Prediction and Verification (M=1.78/7).

The averages on the Reading Attitude scale (ERAS) indicate a medium level for this variable (M=55.48), both in terms of attitude toward recreational reading (M=27.53) and academic reading (M=27.77). Regarding the perception of one's own reading ability, the averages indicate a medium-high level (M=16.68 out of a maximum of 21).

Inferential Analysis

Verification of Hypothesis 1 (H1)

To verify whether there is a significant correlation between awareness of the use of metacognitive strategies and reading performance, the Pearson correlation coefficient (r) was calculated. The normality condition of the data distribution was checked using the Kolmogorov-Smirnov test, which indicated a normal distribution of the data for all measured variables ($p>0.050$).

In Table 3.VI., the correlation coefficients between reading performance and metacognitive awareness according to reading phases are presented, and in Table 4.VI., the correlation coefficients between reading performance and MSI factors are presented.

The results indicated a significant positive relationship between awareness of metacognitive reading strategies and reading performance (r= .368**, p<0.010). As the value of one variable increases, so does the other. All three MSI sub-scales are positively related to comprehension, with the strongest correlation being with MSI - After Reading (r= .379**, p<0.010), followed by MSI - During Reading (r= .321**, p<0.010), and with a smaller effect size with MSI - Before Reading (r= .240*, p<0.050).

Table 3.VI. Correlations Between Awareness of Metacognitive Strategy Use (MSI Scores) and Reading Performance (National Test)

	MSI	**MSI- Before reading**	**MSI- During reading**	**MSI- After reading**
Reading performance	.368**	.240*	.321**	.379**
MSI-total		.875**	.836**	.771**
MSI- Before reading			.573**	.562**
MSI- During reading				.460**

Table 4.VI. Correlations Between Awareness of Metacognitive Strategy Use (MSI Factors) and Reading Performance (National Test)

Indexul Strategiei de Metacomprehensiune (MSI-total)	Reading Performance (National Test)
MSI-predicting and verifying	.203
MSI-previewing	.022
MSI-purpose setting	.294*
MSI-self questioning	.247*
MSI-drawing from background knowledge	.371**
MSI-summarising and applying fix-up strategies	.267*

Regarding the correlations between MSI factors and reading comprehension scores, inferential analysis indicated that the strongest relationship is between reading comprehension and *Activating Prior Knowledge* (r= .368**, p<0.010). There is a significant positive association, but with a smaller effect size, between reading comprehension and: *Goal Setting* (r=.294*, p<0.050), *Summarizing and Applying Repair Strategies* (r=.267*, p<0.050), and *Self-Questioning* (r=.294*, p<0.050).

Verification of Hypotheses 2, 3, 4, 5, and 6

To verify whether there is a significant correlation between awareness of the use of metacognitive strategies, reading performance, and the affective-motivational component, the Pearson correlation coefficient (r) was calculated. The normality condition of the data distribution was checked using the Kolmogorov-Smirnov test, which indicated a normal distribution of the data for all measured variables (p>0.050). In Table 5.VI., the correlation coefficients between reading comprehension and the affective-motivational component are presented, and in Table 6.VI., the correlation coefficients between MSI and the affective-motivational component are presented.

Table 5.VI. Correlations Between Reading Comprehension and the Affective-Motivational Component

	Attitude towards reading	**Attitude toward recreational reading**	**Attitude toward academic reading**	**Perception of reading ability**
Reading comprehension	.267 *	.230	.258*	.387*
Attitude towards reading		.923**	.896**	.468**
Attitude toward recreational reading			.652**	.460**
Attitude toward academic reading				.388**

The results indicated a significant positive relationship between: reading comprehension and overall attitude towards reading (r = .267*, p>0.050); reading comprehension and attitude towards academic reading (r = .258*, p>0.050); and reading comprehension and perception of reading ability (r = .387*, p>0.050). As one variable increases, so does the other.

There are also significant correlations between the affective-motivational components. Perception of reading ability is significantly correlated with attitude towards reading (r = .468**,

p<0.010), with the correlation being stronger between perception of ability and attitude towards recreational reading (r = .460**, p<0.010), compared to academic reading (r = .388**, p<0.010).

Regarding the correlations between MSI and the affective-motivational components, **Table 6.VI.** shows that there is a significant positive association between MSI and perception of reading ability (r= .297*, p>0.050). The correlation between MSI and attitude towards reading is positive but statistically insignificant.

Table 6.VI. Correlation Between Awareness of Metacognitive Strategies and Affective-Motivational Components

	Attitude towards reading	**Perception of reading ability**
Awareness of Metacognitive Strategies (MSI)	.102	.297*

VI.1.6. Research Conclusions

This study investigated the awareness of metacognitive reading strategies among fourth-grade students and their relationship with text comprehension and affective-motivational components. The results showed that students have a low awareness of metacognitive strategies, particularly during and before reading. However, those who are aware of these strategies perform better in text comprehension.

Additionally, a positive association was found between the perception of reading ability and attitude towards reading, as well as between these variables and the awareness of metacognitive strategies. The study suggests the need to develop metacognitive and affective-motivational skills in students to improve written text comprehension.

VI.2. Study 2b. The Relationship Between Reading Monitoring and Reading Comprehension

VI.2.1. Introduction

Although there have been several attempts to classify the components of metacognition, most authors agree that metacognition includes both metacognitive knowledge and metacognitive regulation skills (Baker, 2017; Tarricone, 2011).

The methods for measuring metacognition are divided into two categories: offline and online methods. Offline methods rely on questionnaires and interviews that collect data based on memory and subjective perceptions. They provide information about metacognitive knowledge but do not necessarily indicate how it is applied in practice. Online methods measure metacognitive skills in real-time, during reading activities. Eye movement analysis (Connor et al., 2015) and reading time, which provide more precise data about self-regulation, are examples of online methods. Additionally, the error detection paradigm, used to assess metacognitive control, is applied in language studies, demonstrating that even young children can monitor and regulate comprehension (Skarakis-Doyle, Dempsey, & Lee, 2008), and early intervention can reduce difficulties in understanding written language.

VI.2.2. Research Problem

For a comprehensive representation of the relationship between metacognition and reading comprehension, both metacognitive knowledge and skills related to thinking and regulation during reading need to be considered. Metacognitive knowledge is assessed through offline measures, while metacognitive regulation is best captured through online tasks. In Study 2a, we aimed to examine the relationship between reading comprehension and metacognitive knowledge related to reading (offline). In Study 2b, we aim to explore the association between comprehension monitoring (online) and reading comprehension. The research question will be whether, and to what extent, metacognitive skills are stronger predictors of reading comprehension compared to metacognitive knowledge related to reading comprehension strategies.

VI.2.3. Research Objectives and Hypotheses

Research Objectives

Objective 1: Investigate the level of comprehension monitoring (cognitive regulation) in primary school students.

Objective 2: Investigate the associative relationship between comprehension monitoring and written text comprehension in primary school students.

Research Hypothesis: In third- and fourth-grade students, there is a significant positive relationship between the level of comprehension monitoring (operationalized by the ability to detect inconsistencies in texts) and the ability to comprehend texts.

VI.2.4. Research Methodology

VI.2.4.1. Participant Sample

This study included 51 students from a school in the city of Arad, 14 third-grade students, and 37 fourth-grade students. The school is considered mid-level, located in a non-central area of the city. Regarding gender, 27 of the subjects are boys, and 24 are girls. There are no students with Special Educational Needs Certificates or other diagnosed disabilities in the present sample. No specific sampling method was used, as all students present during testing, whose parents gave consent, were included in the study.

VI.2.4.2. Research Instruments

1. Reading Monitoring Evaluation Task

The comprehension monitoring evaluation task (metacognitive control) was developed by the author and is based on the error detection paradigm. Despite its limitations related to ecological validity, readers' purpose, how they were informed, or the type of errors they identify (Baker & Cerro, 2000), the error detection paradigm is a frequently used method for assessing comprehension monitoring, considered an online evaluation method. In this type of task, the text contains errors that readers with good metacognitive control abilities should identify.

Analysis of Primary School Romanian Language Textbooks and Supplements

From the analysis of primary school Romanian language textbooks and supplements, we identified the presence of exercises focused on detecting errors in both informative and narrative texts, indicating that such tasks are suitable for primary school students. To determine the ability to detect errors, a test was constructed consisting of six texts, which the student reads silently and highlights the errors in the text as they identify them. Students can also revisit the text if they later become aware of an error.

The test was piloted with 10 third-grade students, and from the initial version of 12 errors, one error was excluded, as it could not be identified even after re-reading with the experimenter. The first text is a model, practiced together with the experimenter. In total, 10 errors remain, which the student must identify while reading.

The texts contain errors that can be identified based on prior knowledge, conflicting information within the text, or an understanding of grammatical structures. Each detected error was scored with one point, with the total score ranging from 0 to 10 points. Most of the texts were selected from a volume of tests for the second-grade national evaluation (Grujdin & Borcan, 2016).

This ensured that the required level of prior knowledge was not too high, allowing students to focus on detecting the inconsistencies inserted in the texts.

The test was administered to a sample of 148 students, of which 80 were third graders and 68 were fourth graders. The responses for each item are presented in Table 8.VI.

Table 8.VI. Error Detection Level in the Reading Monitoring Task

Error No.	**Error Description**	**Percentage of Students**
Error 1	"He didn't know where the letter was [...] Then he started reading it"	91.9%
Error 2	"A bed where to eat"	54.7%
Error 3	"She no longer had any little room to live in [...] her only wealth was the beautiful house she lived in"	83.1%
Error 4	"Hardwood and softwood [...] the mixture of the three types of wood"	39.2%
Error 5	"The logs are transported to the factory where the leaves are cut"	44.6%
Error 6	"Rare plants, protected by law, are also found in our gardens"	44.6%
Error 7	"Rare plants [...] The chamois is a protected animal and it is forbidden to hunt it [...] Rare plants"	20.9%
Error 8	"I'm going to say I was in the park, and a kitten came to me. Dad is going to be scared"	22.3%
Error 9	"The second one said: [...] said the second boy"	33.1%
Error 10	"It's always easier to tell the truth, because you have to invent something else!"	64.9%

2. Reading Comprehension Evaluation Test (TECC)

The TECC was developed and validated for the Romanian population by Mih (2004). The purpose of the test is to identify students with reading comprehension difficulties in grades 2-5, aged between 9 and 10. The test contains eight stories, with four levels of difficulty, increasing progressively. Each story is followed by comprehension questions. The number of associated questions varies between 4 (item A1) and 11 (items D1 and D2), with the remaining items being evaluated through 8 questions. Each correct answer is scored with 1 point. The standard allows the distribution of raw scores into standardized classes ranging from I to IX and categorizes students into three groups: high, medium, or low comprehension skills. The author considers students with comprehension difficulties to be those who score within classes I-IV.

VI.2.4.3. Investigation Procedure

The investigation procedure was carried out in two stages:

1. Obtaining consent from the school principal, teachers, and parents for the application of tests, ensuring the confidentiality of the data;

2. Administering the evaluation tests. The Reading Monitoring Test was applied in the classroom. The average administration time was 15 minutes. The TECC was administered individually in the school's psychopedagogical office. The average administration time was 60 minutes. The purpose of each instrument was explained, and additional information regarding item completion was provided at the request of the students.

VI.2.5. Research Results

The data obtained from the questionnaires were processed using IBM SPSS Statistics 20.0 for Windows.

Descriptive Analyses

The subjects individually responded to two tests: Reading Monitoring (metacognitive control) and the Reading Comprehension Evaluation Test (TECC). Below, we present the results for each scale and sub-scale of the test: minimum and maximum scores, mean, standard deviation, and the level at which the subjects are situated.

Table 10.VI. Average Values for Reading Monitoring (Metacognitive Control) and the Reading Comprehension Evaluation Test (TECC)

	Min	**Max**	**Mean**	**SD**	**Level**
Reading Monitoring (Metacognitive Control)	1.00	7.00	4.52	1.61	Average
Reading Comprehension	26.00	62.00	49.39	8.31	Average-high

Descriptive Analysis

The descriptive analysis indicates a medium level of Reading Monitoring (M=4.52) and a medium-high level of Reading Comprehension (M=49.39).

Inferential Analysis

To verify if there is a significant correlation between reading monitoring and reading comprehension, the Pearson correlation coefficient (r) was calculated. The normality condition of the data distribution was checked using the Kolmogorov-Smirnov test, which indicated a normal distribution of the data for all measured variables (p>0.050). In Table 11.VI**.,** the correlation coefficients between error detection scores and reading comprehension are presented. The results indicated a significant positive relationship between Reading Monitoring (metacognitive control) and Reading Comprehension (r = .603**, p<0.010). As the value of one variable increases, so does the other. With an effect size above .50, the strength of the relationship is medium-high. Regarding the correlations between each reading monitoring item and reading comprehension scores, the inferential analysis indicated that the strongest relationship is between Reading Comprehension and *Error 5* (r=.446**, p<0.010), followed by the association between Reading Comprehension and *Error 3* (r =.414**, p<0.010).

There is also a significant positive association, but with a smaller effect size, between Reading Comprehension and *Error 1* (r =.356*, p<0.050) and between Reading Comprehension and *Error 10* (r =.302*, p<0.050).

Table 11.VI. Correlations Between Reading Monitoring (Metacognitive Control) and the Reading Comprehension Evaluation Test (TECC)

Reading Monitoring (Error detection)	**Reading Comprehension (TECC)**
Error 1	356*
Error 2	.128
Error 3	.414**
Error 4	.125
Error 5	.446**
Error 6	.136
Error 7	.207
Error 8	.137
Error 9	.080
Error 10	.302*
Error detection – total score	**.603****

VI.2.6. Research Conclusions

This study aimed to explore the relationship between metacognitive skills and reading comprehension. While Study 2a investigated students' metacognitive knowledge, specifically their awareness of metacognitive strategies during the three phases of reading, Study 2b focused on examining the regulation of cognition involved in reading. Since metacognitive skills are measured through online tasks (during task-solving), the error detection paradigm was chosen. A task was developed with short narrative and informative texts in which students were asked to highlight errors as they identified them, or later, if the text did not make sense. The results showed that students had a medium level of metacognitive control, identifying an average of 5 out of 10 errors.

Study 2b revealed a significant positive relationship between reading monitoring (metacognitive control) and reading comprehension, with a larger effect size than in Study 2a. The results suggest that the error detection task is a better predictor of reading comprehension compared to the questionnaire measuring metacognitive knowledge. The strongest correlations were observed between reading comprehension and errors indicating internal inconsistencies within the text.

The study highlights that errors detected through the activation of prior knowledge or those related to numbers were not significantly associated with text comprehension, suggesting that only internal, antithetical inconsistencies are good indicators of comprehension. This emphasizes a limitation of the Error Monitoring task and suggests the need for a new instrument with more similar items. Additionally, the study suggests that developing inconsistency detection skills should be integrated into educational programs, considering their importance in verifying information in the digital age. Early intervention in education is crucial, especially for children with reading difficulties, through intensive remedial programs and individualized approaches.

CHAPTER VII. STUDY 3 – INVESTIGATING THE EFFECTIVENESS OF THE THERAPEUTIC/LOGOPEDIC EDUCATIONAL PROGRAM FOR TEACHING METACOGNITIVE READING STRATEGIES "I AM A METAREADER" IN STUDENTS WITH READING COMPREHENSION DIFFICULTIES

VII.1. Introduction

Difficulties in understanding written texts are varied and may be caused by learning disorders requiring clinical intervention. However, many students with such problems are not diagnosed in time. In the absence of a clinical diagnosis, students with reading comprehension difficulties are considered weak readers. Speech therapy, which focuses on correcting language disorders, plays an essential role in this context but faces challenges in addressing comprehension difficulties due to the

lack of scientifically validated programs and insufficient training of speech therapists in this area. Speech therapy activities, often conducted as games, either classic or digital, are effective in correcting language disorders. E-games, with their interactive nature and ability to sustain children's interest, have a positive impact on learning by providing immediate feedback and training metacognitive skills. Nevertheless, additional training for speech therapists and the development of new programs are needed to address comprehension difficulties more effectively.

VII.2. Research Problem

Scientific studies and empirical research demonstrate that training metacognitive strategies significantly improves reading comprehension in young students. Research on primary school students shows that the use of metacognitive strategies leads to better knowledge assimilation and superior performance on reading tests (Brown, Pressley, Van Meter, & Schuder, 1996; Mih, 2004). In Study 2 of this paper, it was also shown that students who are more aware of these strategies performed better on the National Romanian Language Assessment. On the other hand, Study 1 concluded that classroom instruction facilitates the development of reading metacognition. If this condition is met, intervention is needed in one of the three elements of the reader-text-context triad to improve comprehension.

Considering the reading context, the educational system provides schools with specialists to intervene where gaps or difficulties in developing academic skills are observed. Specialists such as the school counselor, itinerant teacher, or speech therapist are part of the psychopedagogical team and offer educational services to meet the needs of these children. Regarding the second element of the triad – the text – changes can be made by identifying attractive educational materials for children, with current texts and progressively increasing difficulty levels.

In terms of context, within the speech therapy office, a positive therapeutic relationship is established, based on trust, support, and unconditional acceptance, which facilitates children's progress. Studies have shown that when a child feels safe, they conserve their energy resources for managing possible negative emotions, such as fears or prejudices, and focus on cognitive tasks, freeing creativity and spontaneity. The therapeutic relationship can be considered a mediating variable between teaching comprehension strategies and actual text comprehension, as the child's unconditional acceptance and positive emotions created in the therapeutic context motivate and stimulate the student toward success.

Therefore, the research problem is whether, and to what extent, the inclusion of metacognitive reading strategies in the speech therapy program can contribute to improving

comprehension difficulties in primary school students. Could school speech therapy, through its specific context, therapeutic relationship, and distinct educational materials, facilitate the development of reading metacognition?

VII.3. Research Objectives and Hypotheses

The main objective of this study is to investigate the effectiveness of a speech therapy program aimed at training the metacognitive and affective-motivational processes involved in reading and improving reading comprehension in students with difficulties in understanding written texts. The inclusion of affective-motivational components is anchored in the conclusions of the previous study, which supported the relationship between metacognition, reading, self-concept as a reader, and attitude toward reading.

General Hypothesis: Participation in the educational therapeutic/speech therapy program for teaching metacognitive reading strategies "I Am a Metareader" will be associated with an increased level of written text comprehension, while also training the metacognitive and affective-motivational components of reading.

Specific Hypotheses:

- **H1.** There will be significant differences in reading comprehension between the experimental group and the control group in the post-test phase, as a result of participating in the educational therapeutic/speech therapy program for teaching metacognitive reading strategies "I Am a Metareader."
- **H2.** There will be significant differences in the awareness of using metacognitive reading strategies between the experimental group and the control group in the post-test phase, as a result of participating in the educational therapeutic/speech therapy program for teaching metacognitive reading strategies "I Am a Metareader."
- **H3.** There will be significant differences in the level of comprehension monitoring between the experimental group and the control group in the post-test phase, as a result of participating in the educational therapeutic/speech therapy program for teaching metacognitive reading strategies "I Am a Metareader."
- **H4.** There will be significant differences in the attitude toward reading between the experimental group and the control group in the post-test phase, as a result of participating in

the educational therapeutic/speech therapy program for teaching metacognitive reading strategies "I Am a Metareader."

- **H5.** There will be significant differences in the perception of reading ability between the experimental group and the control group in the post-test phase, as a result of participating in the educational therapeutic/speech therapy program for teaching metacognitive reading strategies "I Am a Metareader."
- **H6.** There will be significant differences in the evaluation of reading activities by classroom teachers between the experimental group and the control group in the post-test phase, as a result of participating in the educational therapeutic/speech therapy program for teaching metacognitive reading strategies "I Am a Metareader."

VII.4. Research Methodology

VII.4.1. Participant Sample

This study included 31 third and fourth-grade students from two schools in Arad, who exhibited difficulties in understanding written texts. Of these, 16 students were part of the experimental group (10 male and 6 female), and 15 were part of the control group (9 male and 6 female). The students were identified with the help of classroom teachers and confirmed through initial evaluations. In the experimental group, 8 students were in the fourth grade, and 8 students were in the third grade. The subjects were not diagnosed with special educational needs and were not receiving remedial therapy provided by the school. Similarly, in the control group, 8 students were in the third grade and 7 in the fourth grade. They also had no special educational needs diagnoses and did not receive school-provided remedial therapy.

VII.4.2. Research Instruments

1. Reading Comprehension Evaluation Test (TECC) – Mih (2004)
2. Metacomprehension Strategy Index (MSI) – Schmitt (1990)
3. Elementary Reading Attitude Survey (ERAS) – McKenna & Kear (1990)
4. Perception of Reading Ability – Eccles, O'Neill, & Wigfield (2005)
5. Comprehension Monitoring Test (own design)
6. Teacher Questionnaire on Student Reading Performance

VII.4.3. Experimental Design

This study is based on a quasi-experimental design with two groups of subjects: an experimental group and a control group. Differences between the evaluated variables will be analyzed based on pre-test (initial) and post-test (after the intervention program) phases, comparing the experimental and control groups.

The **independent variable** (IV) in the study is the educational therapeutic speech therapy program applied to the subjects in the experimental group.

The **dependent variables** (DVs) in the study are:

- Reading comprehension level of written texts
- Awareness of metacognitive reading strategies
- Comprehension monitoring level (metacognitive control)
- Attitude toward reading
- Perception of reading ability (self-concept as a reader)
- Teacher evaluation of students' reading activities

VII.4.4. Investigation Procedure

The research was conducted in three phases: pre-testing, intervention, and post-testing. All students were evaluated in terms of reading fluency, reading comprehension, awareness of metacognitive strategies, metacognitive control, attitude toward reading, perception of reading ability, and teacher evaluation of reading activities. Only the subjects in the experimental group participated in the speech therapy program based on cognitive and metacognitive strategy instruction. The control group students were only tested in the pre-test and post-test phases. The control group was not included in any remedial programs offered by the school. A control group was used to ensure that any differences in student performance could be attributed to the program and not to other intervening factors. The intervention took place between 2019 and 2024. The intervention group students received speech therapy sessions twice a week, with each session lasting 45 minutes.

1. **Pre-test phase.** During the pre-testing phase, students were identified. Only students with a medium to good level of reading fluency and those who scored in TECC levels I, II, III, and IV (indicating comprehension difficulties) were included in the study. All students had parental consent to participate in the experimental study. Students who met these criteria were included in either the experimental or control group. During the pre-testing phase, the evaluation tests presented in Table 3.VII. were administered to both groups.

2. **Experimental phase.** Each intervention session followed a general procedure. The experimental group met with the experimenter twice a week for 45 minutes. The intervention consisted of two stages: teaching metacognitive reading strategies and learning five specific strategies: prediction, questioning, clarifying, monitoring, and summarizing. The intervention was conducted solely by the author for greater objectivity. Each strategy was practiced until the student was able to verbalize their thoughts during the activities. Once a level was achieved, the next was introduced. The program was individualized, with the volume and type of instruction varying from student to student. The sessions were held in school speech therapy rooms after school hours, which were well-equipped and conducive to learning through various activities.
3. **Post-test phase.** The post-test evaluation took place at the end of the school year. In this phase, the same tests used in the pre-test were administered again, with the procedures being identical. All students were present for the post-test evaluation.

VII.4.5. Description of the Therapeutic-Speech Therapy Educational Program

Guiding principles of speech therapy intervention based on scientific theories

The speech therapy intervention program is based on scientific and empirical theories, especially on metacognition and learning theories, and is structured into several stages to guide students toward autonomy in reading. The intervention is constructivist, with the speech therapist working with the student to build learning. The gradual release of responsibility is implemented, and rewards and session structures inspired by behaviorist theory are used. The therapeutic relationship, an essential element of the humanistic intervention, is centered on the unconditional acceptance of the student. The program also integrates concepts from social-cognitive theory and epigenetics, emphasizing the importance of effort, reading strategies, and continuous learning for success in reading and life.

Content of the intervention. Teaching metacognitive strategies

The speech therapy intervention program is based on reading strategies selected from both personal teaching experience and scientific studies that have proven effective for primary school students. Strategies such as prediction, monitoring, and error-detective games were chosen to increase student motivation and attention. The program is structured in two parts: the first part focuses on learning the purpose of reading and raising awareness of thoughts before, during, and after reading, while the second part emphasizes practicing metacognitive reading strategies.

Part 1. Teaching knowledge related to metacognitive strategies

The first part of the speech therapy intervention program focused on teaching knowledge related to metacognitive reading strategies. Students learned to externalize their thoughts before, during, and after reading, using visual materials and interactive games. Activities included modeling thinking out loud through characters, online games on the Wordwall platform, and exploring the purpose of reading through interactive exercises. All educational resources created were organized into a publicly accessible site (https://sites.google.com/view/citire-metacognitiva), providing specialists with useful tools for teaching metacognitive reading strategies.

Part 2. Practicing metacognitive strategies

The strategies taught during the speech therapy sessions were: prediction, questioning, clarifying, summarizing, and monitoring. Table 4.VII. summarizes the content of each strategy. These strategies are taught in three stages: demonstration by the teacher, guided practice, and independent application by the student.

Table 4.VII. Contents of Metacognitive Reading Strategies

Metacognitive Strategy	**Contents**
A. PREDICTION	a1. Prediction based on images a2. Prediction of the title based on images a3. Prediction of the main idea based on the title and images a4. Prediction of the content while reading the text a5. Prediction of the content after reading the text
B. CLARIFICATION	b1. Clarification - text without visual support b2. Clarification - text with visual support
C. QUESTIONING	c1. Teaching questioning based on images and text c2. Teaching questioning and making inferences
D. SUMMARIZATION	d1. Teaching summarization based on sequential images d2. Teaching summarization based on the structure of texts - narrative text d3. Teaching summarization based on the structure of texts - informational text
E. MONITORING (DOES IT MAKE SENSE?)	e1. Teaching monitoring for meaning based on images and the title e2. Teaching monitoring for meaning based on images, the title, and text e3. Teaching monitoring for meaning in texts with external inconsistencies e4. Teaching monitoring for meaning in texts with internal inconsistencies

Here is an example of modeling the strategy of predicting the title based on images (a2):

Modeling the Strategy of Title Prediction Based on Images (a2)

A. Teacher Demonstration of the Strategy (I do it!)

Teaching Scenario: The student is shown a card with an image on it and is informed that this image comes from a short story. It is the only image from the story. On the back of the card, the correct title is written. The student is provided with three possible titles. The task is to predict the correct title based on the image. There are three possible titles available. Based on this image, I will try to guess the correct title (Figures 6.VII and 7.VII).

I think about what the title of this story could be? (Prediction confirmed)

Front of the Card: **Back of the Card:** *The Man Bitten by the Dog*

Three Possible Titles:
1. *The Man Bitten by the Dog*
2. *The Dog Who Lost Its Master*
3. *The Accident*

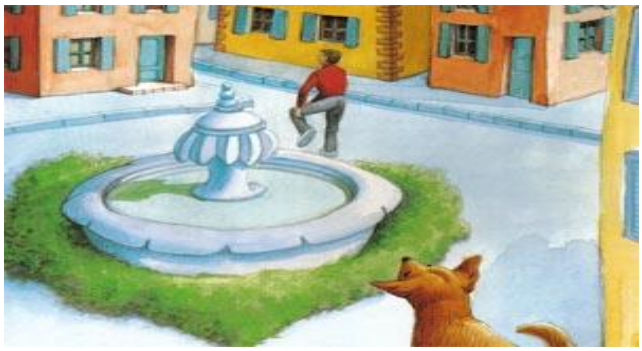

Figure 6.VII. Title Prediction Based on Image – Prediction Confirmed
(*Image sourced from The Most Beautiful Fables by Fedru, Teora Publishing House, 2003*)

Planning*: I see an image with a fountain, a dog, a man, streets, and houses, and I need to guess what the title of the story is. I have three options. I'm going to analyze them all and make a decision.*
Monitoring/Control*: Could the title The Man Bitten by the Dog be suitable? I think so! The man is holding his leg as if he's hurt, and there's a dog in the background. Maybe the man ran, and the dog left him alone. The Dog Who Lost Its Master could also be correct! The dog is alone without its owner and seems to be looking around for him but can't find him. But why is the man holding his*

leg? Maybe he's in pain or tripped. So, the title The Accident *could also be correct. But since the illustrator drew a man with an injured leg and a dog, I think the first title is right. Dogs usually bite people on the leg. I decide to choose title 1 and turn the card to check.*

Evaluation/Verification*: The title is* The Man Bitten by the Dog! *I guessed correctly! I wonder what the story is about? I'm curious to read the story and find out why the man was bitten by the dog.*

Front of the card:

1.The Giant Frog

2. The Frog Showdown

3. The Frog and the Ox

Back of the card: *The Frog and the Ox*

Figure 7.VII. Title prediction based on image – unconfirmed prediction
(Image taken from *The Most Beautiful Fables*. Phaedrus, Teora Publishing, 2003).

Planning: *I see an image with two frogs on a lake, and I need to guess the title of the story. I have three options. I'm going to analyze them all and make a decision.*

Monitoring/Control: *In the image, there are two frogs: one very big sitting on a rock, and one very small sitting on a leaf. The big one is probably so heavy that it can't sit on a leaf anymore. Maybe it ate too much, or it's a rare species of frog? The Giant Frog could be a suitable title, but The Frog Showdown also seems fitting... the big frog looks very angry and ready to attack, while the small one seems really scared... The Frog and the Ox doesn't make much sense... I don't see any ox! I'll choose the title The Frog Showdown! I turn the card to check.*

Evaluation/Verification: *The title is The Frog and the Ox! I didn't guess it! I wonder what the story is about? I'm curious to read it and find out why this image appears in the story.*

B. Guided Practice (We do it!)

Instructional scenario: The student is presented with a card showing an image, and is told that this image is taken from a short story. It is the only image in the story. The correct title is written on the back of the card. We have three possible titles. Based on this image, we will try to guess the correct title. Both the therapist and the child make predictions and compare them. First, the therapist externalizes their thoughts, then the student is invited to do the same.

C. Independent Application of Strategies (You do it!)

Instructional scenario: The student is presented with a card showing an image, and is told that this image is taken from a short story. It is the only image in the story. The correct title is written on the back of the card. We have three possible titles. Based on this image, you will try to guess the correct title. In this stage, only the child makes predictions, externalizing their thoughts.

VII.5. Research Results

The data obtained from the application of the questionnaires were processed using the IBM SPSS Statistics 20.0 program for Windows.

Descriptive Analysis

In both the pre-experimental and post-experimental phases, the subjects from both groups were individually evaluated using six tests: the TECC Test (reading comprehension), the Metacomprehension Strategy Index (MSI), the Comprehension Monitoring Test, the Reading Attitude Survey (ERAS), and the Reading Ability Perception Test. Additionally, the teachers completed a questionnaire regarding the students' reading activities. Below, we present the average scores for each test (Table 5.VII) and the level at which the subjects are situated in the reading comprehension test (Table 6.VII).

From Table 5.VII, an increase in the average scores for all the investigated variables can be observed in the experimental group. Specifically, in the TECC test, subjects presented an average score of M=26.87 in the pre-test phase, which increased to M=42.93 in the post-test. For the Metacomprehension Strategy Index (MSI), the initial average was M=8.06, and after the intervention, it rose to M=20.50. Regarding Comprehension Monitoring, subjects initially had an average level of M=2.75, which increased to an average of M=7.31 after participating in the

program. The average score on the Reading Attitude Scale in primary school (ERAS) also showed differences between the two experimental phases: M=49.68 in the pre-test and M=57.31 in the post-test. The average level of Reading Ability Perception increased from M=15.75 to M=18.31. Additionally, the teachers' assessments of the students' reading activities improved from a baseline of M=12.25 to M=19.37 after the intervention.

Table 5.VII. Average scores for the dependent variables, from pre-test and post-test, in the experimental and control groups.

	EXPERIMENTAL		**CONTROL**	
	Pre-test	**Post-test**	**Pre-test**	**Post-test**
Testul TECC (comprehensiunea citirii)	26.87	42.93	25.40	30.40
Metacomprehension Strategy Index (MSI)	8.06	20.50	7.80	10.46
Comprehension Monitoring (Errors detection)	2.75	7.31	3.06	4.00
Reading Attitude Survey (ERAS)	49.68	57.31	48.33	48.06
Reading Ability Perception Test	15.75	18.31	14.40	15.06
Aprecierea activității de citire (evaluare cadru didactic)	12.25	19.37	12.93	12.72

As for the control group, there was also an increase in the average scores for the dependent variables TECC, MSI, Comprehension Monitoring, and Reading Ability Perception. However, there was a decrease in the average values for Reading Attitude and the teachers' assessments. Independent sample t-tests showed no significant differences between the two groups in the pre-test phase for the measured variables ($p>0.050$). In the next stage, we will check if the differences between the mean scores obtained by the two experimental groups in the post-test are statistically significant.

Regarding the level of reading comprehension, the TECC test standard classifies students into 9 reading levels. Subjects who fall within the first 4 levels, below the average, can be considered students with comprehension difficulties. By examining Table 6.VII and Figure 21.VII, we observe that there are differences in scores and comprehension levels in both experimental groups between the two phases. In the experimental group, before the intervention, out of a total of 16 students, 6 were at level III, and 10 were at level IV. After the intervention, 5 students were at level V, 7 students at level VI, 3 students at level VII, and 1 student at level VIII. As for the control group, the pre-test situation was as follows: level III - 7 students, and level IV - 8 students. In the post-test,

changes were observed as follows: level III - 4 students, level IV - 4 students, level V - 6 students, and level VI - 1 student.

Table 6.VII. TECC Scores (Reading Comprehension) and the Comprehension Level, from Pre- and Post-Test, in the Experimental Group and Control Group.

Group	**EXPERIMENTAL**				**CONTROL**			
Testing phase	**Pre-test**		**Post-test**		**Pre-test**		**Post-test**	
	Score	Level	Score	Level	Score	Level	Score	Level
Participant 1	32	4	49	7	32	4	34	5
Participant 2	29	4	48	7	32	4	41	6
Participant 3	30	4	48	7	21	3	24	3
Participant 4	25	4	45	6	25	3	25	3
Participant 5	22	3	44	6	26	4	34	5
Participant 6	25	4	44	6	24	3	36	5
Participant 7	32	4	53	8	26	4	33	5
Participant 8	24	3	33	5	26	4	28	4
Participant 9	25	3	41	6	24	3	26	4
Participant 10	24	3	38	5	21	3	24	3
Participant 11	24	3	33	5	18	3	22	3
Participant 12	27	4	44	5	30	4	32	4
Participant 13	31	4	37	5	23	3	29	4
Participant 14	23	3	46	6	25	4	33	5
Participant 15	27	4	43	6	28	4	35	5
Participant 16	30	4	41	6				

** Level ≤4 - students with reading comprehension difficulties*

Inferential Processing

Verification of Specific Hypothesis 1 (H1)

To test whether the differences in TECC test scores (evaluation of reading comprehension), as a result of participation in the intervention, between the two experimental groups are significant, we will use the ANOVA test - the GLM path - Repeated Measures, since we have one factor that involves independent samples - type of group (experimental and control), and one that involves paired samples - the moment of testing (before and after). We introduced the TECC scores (pre- and post-test) as the dependent variable (DV), and the type of group (experimental and control) as the fixed factor. The results obtained are presented in Table 7.VII.

Table 7.VII. ANOVA analysis for revealing differences in the post-test phase in the level of reading comprehension performance between the subjects from the experimental group and those from the control group.

Source of variance	Sum of squares	df	Mean square	F	Sig.
Between-Subjects grup exp	760.065	1	760.065	21.945	.000
Between-Subjects error	1004.419	29	34.635		
Within-Subjects factor 1	1717.273	1	1717.273	184.811	.000
Within-Subjects error	269.469	29	9.292		
Interaction factor 1*group exp.	473.725	1	473.725	50.982	.000

We will discuss the interaction between factor 1 (the reading comprehension results from the two experimental phases) and the experimental group. We observe that the interaction between the two testing phases and the experimental groups is statistically significant (p = .000). This means that between the testing phases, there are significant differences between the two groups, experimental and control.

Figure 23.VII shows the differences between the two experimental groups. While in the experimental group the difference between pre- and post-test is substantial (due to participation in the training), in the control group, this difference is much smaller.

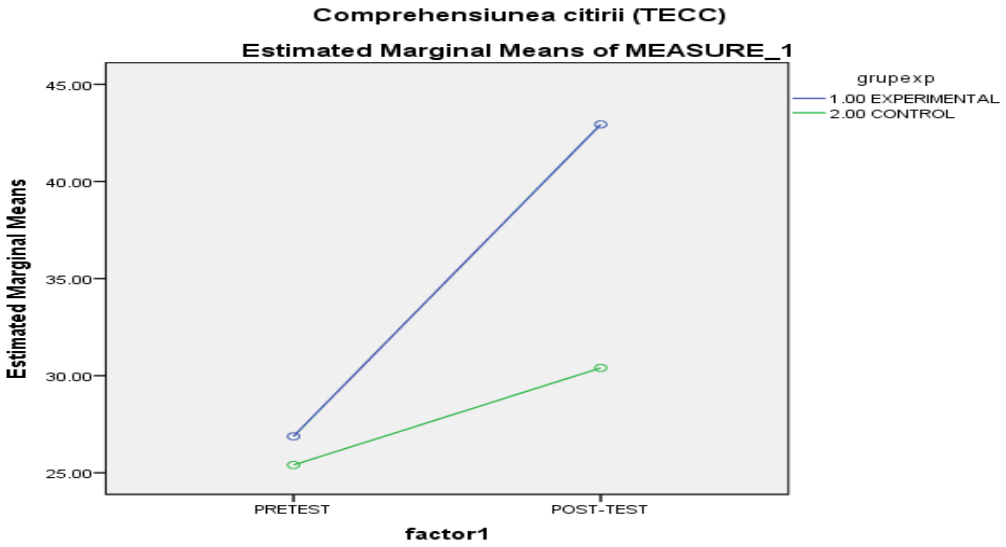

Figure 23.VII ANOVA interaction for revealing performance on the TECC test - control and experimental groups, in the pre-test and post-test phases.

Verification of specific hypothesis 2 (H2)

To test whether the differences in the scores on the Metacomprehension Strategy Index (MSI) between the two experimental groups are significant, as a result of participation in the intervention, we will use the ANOVA - GLM Repeated Measures path, since we have one factor that assumes independent samples - group type (experimental and control) - and one that assumes paired samples - testing moment (before and after). We introduced MSI scores (pre- and post-test) as the dependent variable (DV), and group type (experimental and control) as the Fixed Factor. The results obtained are presented in Table 8.VII.

Table 8.VII ANOVA analysis for revealing post-test differences in the level of awareness of metacognitive reading strategies between subjects in the experimental group and those in the control group.

Source of variance	**Sum of squares**	**df**	**Mean square**	**F**	**Sig.**
Between-Subjects grup exp	410.339	1	410.339	11.719	.002
Between-Subjects error	1015.435	29	35.015		
Within-Subjects factor 1	883.107	1	883.107	109.616	.000
Within-Subjects error	233.635	29	8.056		
Interaction factor 1*group exp.	369.558	1	369.558	45.871	.000

We will discuss the interaction between Factor 1 (MSI results from the two experimental phases) and the experimental group. We observe that the interaction between the two testing phases and the experimental groups is statistically significant ($p = .000$). This means that there are significant differences between the two groups, experimental and control, across the testing phases. While the difference between pre- and post-test in the experimental group is substantial (due to participation in the intervention), in the control group, the difference is much smaller but still statistically significant ($t = -2.337$, $p < 0.50$).

Testing Specific Hypothesis 3 (H3)

To test whether the differences in the Comprehension Monitoring Test (Metacognitive Control) between the two experimental groups are significant as a result of the intervention, we will use the ANOVA - GLM Repeated Measures method, as we have one factor that assumes independent samples – group type (experimental and control) – and one that assumes paired samples

– testing moment (before and after). We entered the Comprehension Monitoring Test scores as the dependent variable (pre- and post-test) and the group type (experimental and control) as the Fixed Factor. The results are presented in Table 9.VII.

Table 9.VII ANOVA Analysis for Revealing Post-Test Differences in Comprehension Monitoring Levels between Subjects in the Experimental Group and the Control Group.

Source of variance	**Sum of squares**	**df**	**Mean square**	**F**	**Sig.**
Between-Subjects grup exp	34.742	1	34.742	8.616	.006
Between-Subjects error	116.935	29	4.032		
Within-Subjects factor 1	116.919	1	116.919	88.217	.000
Within-Subjects error	38.435	29	1.325		
Interaction factor 1*group exp.	50.984	1	50.984	38.468	.000

We will discuss the interaction between factor 1 (results for Reading Comprehension Monitoring from the two experimental phases) and the experimental group. We observe that the interaction between the two testing phases and the experimental groups is statistically significant ($p = .000$). This means that between the testing phases, there are significant differences between the two groups, experimental and control. In the experimental group, the difference between the pre- and post-test is considerable (due to participation in the training), while in the control group, this difference is much smaller but still statistically significant ($t = -3.287$, $p < 0.10$).

Verification of Specific Hypothesis 4 (H4)

To test whether the differences in the Reading Attitude evaluation scale between the two experimental groups are significant as a result of participating in the intervention, we will use the ANOVA test – GLM Repeated Measures path, as we have one factor with independent samples – group type (experimental and control) and one with paired samples – testing moment (before and after). We introduced the dependent variable (DV) as the scores for Reading Attitude (pre- and post-test), with group type (experimental and control) as the Fixed Factor. The obtained results are presented in Table 10.VII. We will discuss the interaction between factor 1 (Reading Attitude results from the two experimental phases) and the experimental group. We observe that the interaction between the two testing phases and the experimental groups is statistically significant ($p = .050$). This means that between the testing phases, there are significant differences between the two groups,

experimental and control. In the experimental group, the difference between the pre- and post-test is significant (due to participation in the intervention), while in the control group, the difference is negative.

Table 10.VII ANOVA Analysis for Revealing Post-Test Differences in Reading Attitude Levels between Subjects in the Experimental Group and the Control Group.

Source of variance	**Sum of squares**	**df**	**Mean square**	**F**	**Sig.**
Between-Subjects grup exp	434.942	1	434.942	1.701	.202
Between-Subjects error	7414.800	29	255.683		
Within-Subjects factor 1	209.594	1	209.594	3.630	.067
Within-Subjects error	1674.342	29	57.736		
Interaction factor 1*group exp.	241.078	1	241.078	4.176	.050

Verification of Specific Hypothesis 5 (H5)

To test whether the differences in the Perception of Reading Ability evaluation scale between the two experimental groups are significant as a result of participating in the intervention, we will use the ANOVA test – GLM Repeated Measures path, as we have one factor with independent samples – group type (experimental and control) and one with paired samples – testing moment (before and after). We introduced the dependent variable (DV) as the scores for Perception of Reading Ability (pre- and post-test), with group type (experimental and control) as the Fixed Factor. The obtained results are presented in Table 11.VII.

Table 11.VII ANOVA Analysis for Revealing Post-Test Differences in Perception of Reading Ability Levels between Subjects in the Experimental Group and the Control Group.

Source of variance	**Sum of squares**	**df**	**Mean square**	**F**	**Sig.**
Between-Subjects grup exp	81.761	1	81.761	7.948	.009
Between-Subjects error	298.335	29	10.287		
Within-Subjects factor 1	40.365	1	40.365	14.166	.001
Within-Subjects error	82.635	29	2.849		
Interaction factor 1*group exp.	13.913	1	13.913	4.883	.035

We will discuss the interaction between factor 1 (results for Perception of Reading Ability in the two experimental phases) and the experimental group. We observe that the interaction between the two testing phases and the experimental groups is statistically significant (p = .035). This means that there are significant differences between the two groups, experimental and control, across the testing phases. While the difference between the pre- and post-test in the experimental group is substantial (due to the intervention), the difference in the control group is much smaller and statistically insignificant (t = -1.022, p > 0.50).

Verification of Specific Hypothesis 6 (H6)

To test whether the differences in the Teacher Evaluation of Reading Activity between the two experimental groups are significant as a result of the intervention, we will use the ANOVA test – GLM Repeated Measures path, as we have one factor with independent samples – group type (experimental and control) and one with paired samples – testing moment (before and after). We introduced the dependent variable (DV) as the scores for Teacher Evaluation of Reading Activity (pre- and post-test), with group type (experimental and control) as the Fixed Factor. The obtained results are presented in **Table 12.VII**.

Table 12.VII ANOVA Analysis for Revealing Post-Test Differences in Teacher Evaluation of Reading Activity Levels between Subjects in the Experimental Group and the Control Group.

Source of variance	**Sum of squares**	**df**	**Mean square**	**F**	**Sig.**
Between-Subjects grup exp	12705.813	1	12705.813	658.519	.000
Between-Subjects error	559.542	29	19.295		
Within-Subjects factor 1	185.635	1	185.635	57.839	.000
Within-Subjects error	93.075	29	3.209		
Interaction factor 1*group exp.	207.699	1	207.699	64.714	.000

We will discuss the interaction between factor 1 (results on the Teacher Evaluation of Reading Activity - from the two experimental phases) and the experimental group. We observe that the interaction between the two testing phases and the experimental groups is statistically significant (p = .000). This means that there are significant differences between the two groups, experimental and control, across the testing phases.

VII.6. Conclusions of the Study

The main objective of this study was to investigate the reading comprehension levels of students with difficulties in understanding written texts who participated in a speech therapy program designed to train the metacognitive processes involved in reading, while also addressing affective-motivational components. The statistical results supported the hypotheses, with students in the experimental group showing significant improvements in both reading comprehension and metacognitive and attitudinal aspects.

In the TECC test, each student in the post-test phase increased by one, two, three, or four levels, with the most significant improvement observed in student no. 7, who rose by four levels (from level IV to level VIII). The results show that the students' participation in the speech therapy program, which involved practicing metacognitive knowledge and the five metacognitive strategies of comprehension (prediction, clarification, questioning, summarization, and monitoring), had significant benefits, with all students surpassing the risk zone for learning disorders.

Although the control group also showed significant differences in the post-test, these were considerably smaller compared to the experimental group. The differences in the control group could be due to neuro-biological maturation, classroom instruction, or other factors that may have influenced these children, which we could not control. Another factor that may have influenced the results is that the same comprehension test was used in both the pre-test and post-test phases, as no other testing instruments were available at the time of initial testing. However, it should be noted that most students in the control group who had a low level of reading comprehension remained stagnant. These children, if not supported, may face significant learning challenges in secondary education. This could confirm the Matthew effect, which suggests that students with learning deficits accumulate more gaps over time, with their results regressing as the difficulty of academic requirements increases (Stanovich, 1986). In an extensive study, Kraus (1993, as cited in Mih, 2004) demonstrated that students with low reading activity scores (1.5 standard deviations below the expected level) who do not receive specialized help are likely to experience generalized academic failure later on.

Other significant results of this study are related to the increase in the metacognitive component, measured through both an offline test (the MSI questionnaire) and an online test (comprehension monitoring - metacognitive control). Many activities in the speech therapy program involved error detection and awareness of metacognitive strategies, so this result is not surprising. More interesting is the observation of the combination of the metacognitive and affective-

motivational components in the two experimental groups. Even though the control group showed improvements in comprehension performance and metacognitive components, their attitude towards reading decreased, and their self-concept did not improve significantly compared to the experimental group, where all these components improved remarkably. We believe that students with reading comprehension difficulties should be approached individually through specific therapies that also lead to increased self-confidence and awareness of the importance of reading written texts in everyday life.

Another conclusion of the research refers to the effectiveness of including technology and online games in teaching metacognitive strategies. Braad et al. (2022) tested the effectiveness of a digital support focused on the self-explanation method to develop metacognition in students. The results showed that subjects with high levels of metacognition considered the digital support irrelevant, while students with low levels of metacognition did not know how to take advantage of the digital tool. Therefore, in this study, care was taken to ensure that the digital educational materials were relevant, attractive, and adapted to the learning pace and psycho-pedagogical characteristics of the students included in the experimental investigation.

In terms of observations made during interactive online activities, the main finding is that students display both positive emotions such as joy and excitement and negative ones such as frustration, anger, or sadness. The students' attention is focused during the games, and in the vast majority of cases, they complete the tasks. There is also a noticeable concern for the computer's feedback, even when the teacher confirms the correct answer beforehand. Among the activity templates proposed in Wordwall, the favorite game was "Win or Lose the Test," where the goal is to earn as many points as possible. This type of game involves betting on a number of points, and the more confident the player is in the correctness of their answer, the more points they can win. Although the motivation is external, the student's attention is highly focused, and the items are processed deeply. For example, some children read a passage three or four times to bet on as many points as possible. This type of activity closely aligns with the specific nature of speech therapy, where exercises are progressive and repeated until the new skill is mastered. Additionally, the "Win or Lose the Test" game facilitates the training of metacognitive experiences, judgments, and metacognitive sensitivity by asking students to anticipate their performance level and receive immediate feedback on the accuracy of their self-assessment.

Students with reading difficulties tend to avoid or abandon tasks that involve reading, as this is a domain they struggle to master. Digital games, with their imagery and interactivity, maintain focused attention on the task and increase student engagement. Reading becomes a game, making it

more enjoyable and attractive. The musical background creates an environment conducive to learning and adventure, reducing possible effects related to a lack of interest or motivation. Moreover, feedback is objective and provided by a robot rather than a human, which reduces the level of frustration in the case of an incorrect answer. Although the students were informed that the game developer was the researcher, they eagerly awaited the computer's feedback. This indicates a high level of trust in an external, objective device compared to a human, subjective evaluator. Feedback from a teacher is often perceived as subjective and accompanied by a judgment of personal value, which is not the case with robotic evaluators. However, it is necessary to remind students that behind computers are people, and information must always be analyzed and filtered.

In conclusion, along with teachers who positively assessed the reading activity of students who participated in speech therapy, we believe that an intervention designed to facilitate the cognitive, metacognitive, and affective-motivational aspects of reading has positive effects on the student's overall personality.

We cannot, however, claim with certainty that the results are solely due to the method taught. It is possible that other variables, such as the attention given to the students or the novelty of the elements, may have intervened. Nevertheless, the statistical results support that much of the progress in the post-test phase can be attributed to the educational program.

This study provides a valuable tool for speech therapists and other educational professionals. The exercises proposed in the "I am a Metareader" program can be implemented by parents or other professionals in the educational field. The therapy program is based on scientific data, and the results of this work have demonstrated the effectiveness of teaching metacognitive strategies to young students with comprehension difficulties.

Regarding the limitations of the present study, we can mention challenges related to program implementation and sample size. First, the program's implementation is time-consuming. It requires varying amounts of time and limits a correct prognosis regarding the duration of the intervention. Additionally, being an individualized intervention program, it depends on other factors that could interact with the expected results.

Second, although the hypotheses were supported, further research is necessary, including various types of interventions for control groups. These interventions would guarantee that the superior performance in comprehension activity in the experimental group is due to the training itself and not the experimental situation, interaction with the experimenter, the therapeutic relationship, or even the novelty of the tests.

Furthermore, a larger sample would increase the predictive power of the independent variable. Although identifying children with similar characteristics to those in this study is challenging, replication of the study by other researchers or with a larger group of subjects is necessary.

CHAPTER VIII. FINAL CONCLUSIONS

The aim of this research was to investigate the relationship between metacognition and reading comprehension at the primary school level. To achieve this goal, both actors in the educational dyad—teachers and students—were considered. Thus, the research was divided into three studies, each designed to identify and explore the factors related to reading comprehension and metacognitive strategies in primary education.

In Study 1, we examined the awareness of teachers regarding their teaching practices related to metacognitive reading comprehension strategies. In Study 2, we investigated whether and to what extent students are aware of and apply these strategies, and their relationship to reading performance. Study 3 was an experimental intervention designed to empirically test the association between metacognitive training and the level of understanding of written texts. Additionally, we explored the connection between cognition, metacognition, and affective-motivational aspects of personality, based on the premise that reason and emotion cannot be separated but work together in shaping human behavior.

The investigative approach addressed the research questions, and the main conclusions of the studies are as follows:

- The level of awareness of teaching practices related to metacognitive reading strategies among primary school teachers is high;
- There is a significant positive relationship among teachers between the awareness of teaching metacognitive reading strategies, general metacognitive teaching awareness, and the awareness of their own reading strategies;
- Among 4th-grade students, there is a significant positive association between reading comprehension and the awareness of metacognitive reading strategies;
- Among 4th-grade students, there is a significant positive association between reading comprehension performance, the metacognitive component, and the affective-motivational component of reading (reflected in reading attitude and self-concept as a reader);

- Online metacognitive evaluation tools (such as error detection) are stronger predictors of reading comprehension than offline tools;
- Reading difficulties can be improved by teaching metacognitive strategies, with most students participating in the intervention reaching a post-test comprehension level comparable to the average of students without difficulties;
- The educational intervention program, of a therapeutic/logopedic nature, improves both reading performance, metacognitive knowledge, and the affective-motivational aspects of students with reading difficulties.

This research highlights the need for individualized intervention in teaching metacognitive reading strategies to students with reading comprehension difficulties. It emphasizes the necessity of explicitly teaching reading comprehension strategies to improve both metacognitive knowledge and skills. Additionally, building a strong therapeutic relationship and designing and selecting modern and engaging teaching materials are key elements in fostering a positive attitude toward reading among students with comprehension difficulties. Explicitly teaching metacognitive reading strategies in a logopedic therapeutic setting improves reading comprehension levels in primary school students with comprehension difficulties.

At the theoretical level, this work contributes by offering an explanatory model of reading comprehension in students with comprehension difficulties (Study 2) and underlines the need for a comprehension curriculum based on scientific evidence in speech therapy practice.

At the practical level, the contribution of this research includes:

- Providing researchers with a tool for measuring the teaching of metacognitive strategies (Study 1);
- Suggesting an instructional design for training teachers in teaching metacognitive strategies, following the identification of a significant positive association between general metacognitive teaching and the teaching of metacognitive reading strategies (Study 1);
- Offering specialists a tool for assessing comprehension monitoring (error detection) (Study 2);
- Providing speech therapists and other specialists with a set of classic and digital exercises and activities to train five metacognitive reading comprehension strategies, correlated and articulated, based on scientific data, which can be used in remedial interventions for primary school students (Study 3).

However, the intervention program does not allow for specifying which instructional sequences contributed directly to improving reading competence. Future studies could identify which metacognitive strategy has the greatest impact on reading comprehension in this category of students. Moreover, testing the program on students with other types of learning difficulties could further illustrate the educational benefits brought by metacognitive instruction.

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SUMMARY OF THE RESEARCH

	Study 1	Study 2a	Study 2b	Study 3
Research Problem	Are primary education teachers aware of the teaching practices of metacognitive reading strategies?	Is there an association between the awareness of metacognitive reading strategies and reading comprehension of written texts among primary school students?	Is there an association between comprehension monitoring and text comprehension among primary school students?	Does the inclusion of students with text comprehension difficulties in the "I Am a Metareader" program affect reading comprehension?
Period	2017-2018	2018-2019	2019-2020	2019-2024
Design Type	Descriptive and correlational	Descriptive and correlational	Descriptive and correlational	Quasi-experimental
Subjects	Primary education teachers (N=70)	Fourth-grade students (N=85)	Third- and fourth-grade students (N=51)	Experimental group: N=16 third- and fourth-grade students Control group: N=15 third- and fourth-grade students
Instruments	1. Awareness of teaching practices for metacognitive reading strategies – self-developed 2. The Metacognitive Awareness Inventory for Teachers-MAIT (Balcikanli, 2011) – adapted 3. Metacognitive Awareness of Reading Strategies Inventory-MARSI (Mokhtari & Reichard, 2002) – adapted	1. Metacomprehension Strategy Index-MSI (Schmitt, 1990) – adapted 2. The Elementary Reading Attitude Survey-ERAS (McKenna & Kear, 1990) – adapted 3. Reading ability perception (adapted from Eccles et al., 1993) 4. National reading comprehension assessment (Romanian Language, 2019)	1. Evaluation of Reading Comprehension Monitoring (error detection) – self-developed 2. Reading Comprehension Test (TECC), Mih (2004)	Pre-test and post-test 1. Reading Comprehension Test (TECC), Mih (2004) 2. MSI (Schmitt, 1990) – adapted 3. ERAS (McKenna & Kear, 1990) – adapted 4. Reading ability perception (adapted from Eccles et al., 1993) 5. Evaluation of comprehension monitoring – self-developed 6. Teacher assessment of student reading activity – self-developed

	Study 1	Study 2a	Study 2b	Study 3
Procedure	- Development of instrument no.1, piloting, validation - Translation and validation of instruments 2 and 3 - Application of instruments 1, 2, and 3	- Translation and adaptation of instruments 1, 2, and 3 - Application of instruments 1, 2, and 3 - Collection of results from instrument 4	- Development of reading comprehension monitoring assessment (error detection) - Application of instruments	- Pre-test: Assessment of baseline skills - Intervention: Teaching five metacognitive strategies: prediction, clarification, questioning, summarization, and monitoring during speech therapy sessions - Post-test: Assessment of skills after intervention
Main Results	- High level of awareness regarding the teaching of metacognitive reading strategies - Significant positive relationship between the awareness of teaching metacognitive reading strategies, general metacognitive teaching awareness, and metacognitive awareness of personal reading strategies	Significant positive relationships between: - reading comprehension and awareness of metacognitive reading strategies - reading comprehension and reading ability perception - reading comprehension and attitude towards reading - reading ability perception and attitude towards reading	Significant positive relationships between: - comprehension monitoring and reading comprehension	In the experimental group: - Improvement in text comprehension skills - Increased awareness of the use of metacognitive reading strategies - Improved comprehension monitoring - Enhanced perception of ability and attitude towards reading - More positive evaluation from teachers
Main Conclusion Related to the Study Objective	The need for individualized teaching of metacognitive reading strategies for students with text comprehension difficulties.	The need for explicit teaching of reading comprehension strategies to improve both metacognitive strategy awareness and affective-motivational components, such as the perception of ability and attitude towards reading.	Metacognitive skills, such as detecting internal inconsistencies in texts, are a stronger predictor of comprehension compared to metacognitive knowledge (study 2a) and need to be systematically trained.	Explicit teaching of metacognitive reading strategies in a therapeutic speech therapy setting improves reading comprehension levels in primary school students with comprehension difficulties.