





## Correlation of Reading Attitude, Anxiety, Self-efficacy, Metacognition Factors and Their Predictive Power on Reading Comprehension<sup>1</sup>

### Okumaya Yönelik Tutum, Kaygı, Öz Yeterlik ve Üstbiliş Etmenlerinin İlişkisi ve Okuduğunu Anlama Becerisini Yordama Düzeyleri

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**Abstract.** The reading comprehension skill, which is accepted as the basis of academic skills, has been the subject of many studies due to its importance, and various studies have been conducted on which factors affect this skill and to what extent. Contemporary teaching approaches have increased the importance of affective factors such as attitude, anxiety and self-efficacy. At the same time, the rapid change in learning needs has brought metacognitive skills to the forefront. The aim of this study is to determine the relationship between the attitude, anxiety, self-efficacy and metacognition factors, which are accepted to affect reading comprehension skills, and to examine the level to which these factors predict reading comprehension skills through a model. The study was designed using quantitative methods and conducted within a correlational research model. The sample group of the study consists of 386 middle school students at the 7th grade level. In obtaining the data, the attitude towards reading, anxiety, self-efficacy, metacognition scales and the reading comprehension achievement test, whose validity and reliability have been previously proven, were used. Correlation analysis and structural equation model were used in the analysis of the data. According to the findings obtained as a result of the study, it was seen that there was a positive relationship between the variables of attitude, self-efficacy and metacognition, while a negative relationship was seen between these variables and anxiety. While it was observed that reading comprehension skill had a positive relationship with attitude and self-efficacy and a negative relationship with anxiety, no significant relationship was found between reading comprehension skill and metacognition. In the structural equation model created, it was concluded that anxiety and metacognition predicted reading comprehension skill negatively, self-efficacy predicted positively, and attitude did not.

**Keywords:** Reading skills, Reading comprehension, Attitude, Anxiety, Self-efficacy, Metacognition.

**Öz.** Akademik becerilerin temeli olarak kabul edilen okuduğunu anlama becerisi öneminden dolayı birçok çalışmaya konu olmuş, bu beceriyi hangi etmenlerin ne düzeyde etkilediği konusunda çeşitli araştırmalar yapılmıştır. Çağdaş öğretim yaklaşımları tutum, kaygı ve öz yeterlik gibi duyuşsal etmenlerin önemini artırmıştır. Aynı zamanda öğrenme ihtiyaçlarının hızla değişmesi, üstbilişsel becerileri ön plana çıkarmıştır. Bu çalışmanın amacı okuduğunu anlama becerisini etkilediği kabul edilen tutum, kaygı, öz yeterlik ve üstbiliş etmenlerinin birbirleriyle olan ilişkisini belirlemek ve bu etmenlerin okuduğunu anlama becerisini hangi düzeyde yordadığını bir model aracılığıyla incelemektir. Araştırma nicel yöntemlerle tasarlanmış ve korelasyonel modelde yürütülmüştür. Çalışmanın örneklem grubu 7. sınıf düzeyinde 386 ortaokul öğrencisinden oluşmaktadır. Verilerin elde edilmesinde geçerliği ve güvenilirliği önceden kanıtlanmış olan okumaya yönelik tutum, kaygı, öz yeterlik, üstbiliş ölçekleri ve okuduğunu anlama başarı testi kullanılmıştır. Verilerin analizinde korelasyon analizi ve yapısal eşitlik modeli kullanılmıştır. Çalışma sonucunda elde edilen bulgulara göre tutum, öz yeterlik ve üstbiliş değişkenleri arasında pozitif yönlü bir ilişki olduğu görülürken bu değişkenler ile kaygı arasında negatif yönlü bir ilişki görülmüştür. Okuduğunu anlama becerisinin tutum ve öz yeterlik ile pozitif yönlü, kaygı ile negatif yönlü ilişkiye sahip olduğu görülürken okuduğunu anlama becerisi ile üstbiliş arasında anlamlı bir ilişki bulunamamıştır. Oluşturulan yapısal eşitlik modelinde kaygı ve üstbilişin okuduğunu anlama becerisini negatif yönde, öz yeterliğin pozitif yönde yordadığı; tutumun ise yordamadığı sonucuna ulaşılmıştır.

**Anahtar Kelimeler:** Okuma becerisi, Okuduğunu anlama, Tutum, Kaygı, Öz yeterlik, Üstbiliş.



## Genişletilmiş Özet

**Giriş.** Okuma ve okuduğunu anlama becerisi, bireyin eğitim sürecindeki başarısını doğrudan etkileyen temel bir yetkinliktir. Bu beceriler, bireyin bilgi birikimi ve sözcük dağarcığını zenginleştirirken eğitim süreçlerinden daha fazla verim almasını da sağlar. Okuduğunu anlama sürecine tutum, kaygı, öz yeterlik ve üstbilgi gibi duyuşsal ve bilişsel unsurlar önemli düzeyde etki etmektedir. Bu çalışma, okuma ile ilgili bu temel unsurların birbirleriyle olan ilişkilerini ve bu unsurların okuduğunu anlama üzerindeki yordama gücünü incelemeyi amaçlamaktadır. Bu bağlamda, bireylerin duyuşsal özellikleri ile bilişsel beceriler arasındaki bağlantılar somut bir model üzerinden analiz edilmiştir.

**Yöntem.** Araştırma, nicel yöntemlere dayalı olarak tasarlanmış ve korelasyonel araştırma modeline göre yürütülmüştür. Çalışma, İzmir'deki devlet okullarında öğrenim gören 7. sınıf öğrencilerinden oluşan toplam 386 kişilik bir örneklem grubu ile gerçekleştirilmiştir. Veriler, geçerliği ve güvenilirliği kanıtlanmış dört ölçek (Okumaya Yönelik Tutum Ölçeği, Okuma Kaygısı Ölçeği, Okuma Üstbilgi Ölçeği, Okuma Öz Yeterlik Ölçeği) ve bir başarı testi (Okuduğunu Anlama Testi) aracılığıyla toplanmıştır. Analizlerde korelasyon analizleri ve yapısal eşitlik modellemesi (SEM) kullanılmış ve hipotez modelin geçerliliği bu yöntemlerle test edilmiştir.

**Bulgular.** Korelasyon sonuçlarına göre;

- Tutum, öz yeterlik ve üstbilgi değişkenleri arasında pozitif yönlü orta düzeyde anlamlı ilişkiler bulunmuştur.
  - Kaygı ve diğer değişkenler arasında ise negatif yönlü anlamlı ilişkiler gözlemlenmiştir.
  - Özellikle kaygının hem tutum hem de öz yeterlik üzerinde olumsuz bir etkisi olduğu tespit edilmiştir.
- Yapısal Eşitlik Modeli sonuçlarına göre;
- Kaygı ve üstbilginin okuduğunu anlama becerisi üzerinde negatif yönde bir etkisi olduğu görülmüştür.
  - Öz yeterliğin değişkenler arasında okuduğunu anlama becerisini pozitif yönde yordayan en güçlü değişken olduğu bulunmuştur.
  - Tutum değişkeninin, okuduğunu anlamaya doğrudan bir etkisi olmadığı tespit edilmiştir.

**Tartışma ve Sonuç.** Çalışma sonuçları, okuma ve anlamaya yönelik duyuşsal faktörlerin etkisinin oldukça önemli olduğunu ortaya koymaktadır. Özellikle öz yeterlik algısının olumlu etkisi ve kaygının olumsuz etkisi, literatürde yer alan diğer çalışmalarla da uyumludur. Ancak tutumun doğrudan etkisinin olmaması, bu değişkenin dolaylı yollardan (örneğin motivasyon veya çevresel etkenler aracılığıyla) etkili olabileceğini düşündürmektedir. Bu bulgular, eğitim uygulamalarında öğrencilerin duyuşsal özelliklerinin geliştirilmesine yönelik stratejilere ağırlık verilmesi gerektiğini göstermektedir. Araştırma, okuduğunu anlama becerisinin bireysel ve duyuşsal faktörlerden nasıl etkilendiğini somut verilerden oluşan bir model ile açıklamıştır. Eğitim politikaları ve öğretim yöntemlerinin geliştirilmesinde bu bulgular önemli bir rehber niteliğindedir. Özellikle kaygıyı azaltan ve öz yeterliği artıran uygulamaların, öğrencilerin akademik başarılarını yükseltmede etkili olacağını göstermektedir.

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## Introduction

Reading and reading comprehension skills are regarded as the foundation of academic competencies. The development of reading comprehension skills brings numerous benefits to an individual's academic life. First and foremost, it enhances the efficiency of the educational process, enriches an individual's knowledge base and vocabulary, and provides background knowledge essential for new learning experiences. Additionally, it facilitates the assessment and evaluation process, directly contributing to academic success. A comprehensive examination of reading comprehension skills and an in-depth investigation of methods that enhance these skills will not only contribute to the field of reading and comprehension but also serve as a guide for educators and researchers in achieving academic success.

Reading is also an affective process. An individual's perceptions and emotional state influence the reading and comprehension process. Contemporary educational approaches acknowledge that psychological factors play a crucial role in an individual's learning process. According to Ülper (2019:3), definitions of reading often emphasize its cognitive aspects while neglecting its affective dimensions. However, modern educational approaches frequently highlight the necessity of considering affective factors as well. For this reason, Ülper (2019:3) redefined the act of reading by incorporating affective aspects, stating that reading is "a repetitive meaning-making process with an affective dimension, in which individuals who recognize the semantic and grammatical properties of the language in which the written text is produced decode information rapidly and employ various strategies in accordance with specific purposes." The emphasis on affective factors in contemporary educational approaches has led to an increasing focus on concepts such as attitude, anxiety, self-efficacy, and motivation in recent research on the learning process.

Since reading and comprehension are multidimensional and complex processes, numerous factors influence reading comprehension skills. Among the primary factors highlighted in contemporary educational approaches are attitude, anxiety, self-efficacy, and metacognition. Many studies have examined the relationship between these factors, language skills, and reading. Investigating the interactions between these concepts, constructing a model that demonstrates the factors influencing reading comprehension, and empirically testing this model would provide significant insights. A deeper understanding of the reading comprehension process and the integration of findings from such studies into educational practices will not only facilitate better academic outcomes but also clarify the impact of these critical factors.

Empirical evidence from research suggests that cognitive and affective instructional practices reinforce one another. Guthrie et al. (2007) found that elementary school students who received both cognitive and affective instructional support demonstrated greater improvements in reading comprehension, content knowledge, reading attitudes, and strategy use compared to those who received only cognitive support. Similarly, Dolezal et al. (2003) discovered that teachers who foster high levels of student motivation tend to employ cooperative learning techniques, encourage student autonomy, and use various motivation-enhancing strategies that promote student

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responsibility. These findings emphasize the importance of integrating instructional practices designed to enhance both reading comprehension and motivation.

Given that reading comprehension is fundamental to academic achievement and plays a vital role in instructional processes, it is essential to examine it in conjunction with key concepts emphasized in contemporary teaching methods. The restructuring of knowledge concerning attitude, anxiety, self-efficacy, and metacognition— affective factors that have gained significance in modern educational approaches—will contribute significantly to the field. It is imperative to determine the extent to which these factors influence reading comprehension skills and to elucidate their interrelationships in a concrete manner. Educational practices and research should be structured within this framework of interconnected relationships. In this regard, mapping the network of interactions between these factors and reading comprehension will lead to a more comprehensive understanding of the nature of reading comprehension and provide valuable insights for future research.

### **Reading and attitude**

Research indicates that a positive attitude toward reading has a greater impact on an individual's academic success than many other variables. According to the findings of a study conducted by Clark, Torsi, and Strong (2005), a love for reading influences children's academic achievement more significantly than their family's socioeconomic status or wealth. Similarly, Petscher (2010), through a meta-analysis of 32 studies, found that the overall strength of the relationship between reading attitude and academic success was moderate. However, this relationship was stronger for elementary school students compared to middle school students. Fishbein and Ajzen (1975) define attitude as a learned predisposition acquired over time, rather than an innate characteristic, which leads an individual to respond positively or negatively based on specific experiences. Therefore, an individual's attitude toward reading develops gradually as a result of values, beliefs about the outcomes of reading, and specific reading experiences. In other words, social factors and expectations progressively shape reading attitudes (McKenna et al., 1995).

Reading comprehension, or the process of constructing meaning while reading, is not merely a cognitive effort but also a motivated action. Given the intentional nature of reading comprehension, attitude and motivation toward reading are essential components of students' reading success (Guthrie and Wigfield, 1999). Therefore, it is crucial to consider the factors influencing reading attitude. Kanmaz and Saracaloğlu (2012) suggest that parental education levels, children's access to reading materials, and the reading attitudes of their social environment play a significant role in fostering a positive reading attitude in children.

### **Reading and anxiety**

One of the affective factors identified in the literature as influencing reading comprehension skills is anxiety. Defined in the Turkish Language Association Dictionary (2005) as "a state of distress,

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worry, or concern,” anxiety is described by Bandura (1997) as a state of apprehension that arises in response to situations perceived as potentially harmful to the individual. Jalongo and Hirsh (2010) examined the concept of anxiety as used by psychologists in the literature and explained it in relation to fear. According to their findings, while fear is a reaction to present or imminent threats, anxiety is a fear response to imagined or distant threats. Anxiety can be described as a future-oriented sense of helplessness that threatens self-esteem. When experienced intensely, it interferes with concentration.

Several theories have been developed to explain the effects of anxiety on individual performance. One such theory is the Processing Efficiency Theory, proposed by Eysenck and Calvo (1992). According to this theory, anxiety affects an individual's performance in terms of efficiency and competence. Anxiety also impacts working memory, which consists of three main components. The first is the central executive, which plays a role in processes such as planning, strategy formation, and attention control. The second component is the phonological loop, which is responsible for rehearsing verbal information. The third is the visuospatial sketchpad, which processes visual information. Thoughts unrelated to the task at hand negatively affect the functioning of the central executive. According to this theory, individuals experiencing high levels of anxiety struggle to perform effectively because their central executive is occupied with managing both task-related and anxiety-related processes simultaneously (Derakshan and Eysenck, 2009).

Building on this theory, the Attentional Control Theory was later developed as an extended model (Eysenck et al., 2007). According to this theory, anxiety disrupts the central executive's ability to regulate attention, which, in turn, impairs cognitive performance (Derakshan and Eysenck, 2009). Individuals with high anxiety levels tend to allocate their cognitive attention resources to internal worries or external threat-related stimuli, thereby reducing their ability to focus on the actual task and leading to decreased performance (Yamaç and Çeliktürk Sezgin, 2018).

Based on the synthesis of existing literature, reading anxiety can be defined as the state of concern that individuals develop toward reading due to negative experiences encountered in reading processes. In three studies conducted in Turkey to determine the relationship between reading comprehension skills and anxiety, it was concluded that there was a significant and negative relationship between anxiety and reading comprehension (Yamaç and Çeliktürk Sezgin, 2018; Altunkaya and Erdem, 2017; Katrancı and Kuşdemir, 2016). Furthermore, an individual's anxiety toward reading not only disrupts reading processes but also prevents reading from becoming a habitual practice. Tonka (2020) found a significant negative correlation between reading anxiety and reading habits. This finding suggests an important implication: reducing anxiety should be considered a prerequisite for fostering reading habits in individuals.

The fundamental goal of reading activities is to construct meaning from the text, and all other objectives stem from this process. However, anxiety occupies cognitive resources, leaving insufficient mental capacity for meaning-making, thereby preventing full comprehension. The mind becomes preoccupied with the source of anxiety rather than focusing on the reading task. Empirical

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studies support this claim. In a study investigating the relationship between anxiety and reading comprehension, Katrancı and Kuşdemir (2016) found a significant negative correlation between the two variables. Their findings also indicated that students with lower reading anxiety were more successful in identifying the main idea of a text. Both results highlight the detrimental effect of high anxiety levels on the meaning-making process during reading.

### **Reading and self-efficacy**

Self-efficacy, defined by Bandura (1986: 391) as “an individual’s judgment regarding their capacity to coordinate and successfully execute the necessary actions to achieve a specific performance,” is described by Snyder and Lopez (2002: 278) as being less about a perceived skill acquired through observation and more about how individuals respond to the question, “What can I do?” given their existing abilities under specific conditions. An individual’s self-efficacy is not determined by their level of competence in a given skill but rather by their belief in their ability to use that skill effectively. The way individuals feel, think, and behave is shaped by their self-efficacy perceptions. Increased personal satisfaction, leading to higher levels of success, is strongly associated with a high level of self-efficacy. While individuals with high self-efficacy exhibit confidence, resilience, and a strong stance when facing challenging tasks, those with low self-efficacy tend to perceive tasks as more difficult than they actually are, which prevents them from effectively addressing the problems they encounter in the process (Kaptan and Korkmaz, 2001: 1; Senemoğlu, 2002: 235-236).

Bandura (2004: 622) identifies four fundamental sources for developing a strong sense of self-efficacy: mastery experiences (direct experiences), vicarious experiences (indirect experiences), verbal persuasion, and physiological and emotional states. Individuals process the information derived from these sources to construct their self-efficacy beliefs.

Given that reading and comprehension skills involve not only cognitive but also affective dimensions, it is crucial to examine self-efficacy—one of the most predictive factors of learning success—within the context of reading skills. Based on the definition of self-efficacy, reading self-efficacy can be defined as an individual's perception of their competence in reading skills and processes. Reading self-efficacy has been widely explored in both national and international research. Studies investigating the relationship between self-efficacy beliefs and reading skills have consistently reported a significant positive correlation between these two variables (Ülper and Şirin, 2019; Altunkaya, 2018: 209; İnnalı and Aydın, 2014; Solheim, 2011).

### **Reading and metacognition**

John Flavell first introduced the term metacognition in the late 1970s, defining it as “cognition about cognitive phenomena” or, more simply, “thinking about thinking” (Flavell, 1979, p. 906). Many educators have adopted this simplified definition, describing metacognition as “thinking about thinking” (Livingston, 2003; Lai, 2011). However, a more precise definition considers

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metacognition as the monitoring and regulation of thought processes (Martinez, 2006, p. 696). Cross and Paris (1988) define metacognition as “children’s knowledge and control over their own thinking and learning activities.” According to Livingston (2003), metacognition refers to higher-order thinking that actively controls cognitive processes related to learning. Since metacognition plays a crucial role in successful learning, it is important to focus on its development to help students effectively manage their cognitive resources through metacognitive control.

Lai (2011) identifies two fundamental components of metacognition: knowledge and regulation. Metacognitive knowledge includes awareness of oneself as a learner, factors that influence performance, knowledge of strategies, and understanding when and why to use them. Metacognitive regulation refers to monitoring one's cognition, involving planning activities, awareness of comprehension and task performance, and evaluating the effectiveness of monitoring processes and strategies. Many researchers (Flavell, 1979; Cross and Paris, 1988; Paris and Winograd, 1990; Whitebread et al., 2009) agree that metacognition consists of knowledge about cognition and monitoring of cognition. They also highlight the interrelationship between these two components, as they mutually influence one another. Later metacognition researchers proposed different frameworks to classify cognitive knowledge. For instance, many scholars distinguish between declarative and procedural knowledge (Cross and Paris, 1988; Schraw and Moshman, 1995; Kuhn, 2000; Schraw et al., 2006). The second component of metacognition—monitoring cognition—encompasses planning, monitoring/regulating, and evaluating cognitive activities.

Haller et al. (1988) identify three mental activity clusters inherent in metacognition within the context of reading comprehension: awareness, monitoring, and regulation. In this framework, awareness involves recognizing explicit and implicit information, as well as responding to textual inconsistencies or errors. Monitoring includes setting goals, self-questioning, paraphrasing, activating relevant background knowledge, making connections between new and previously learned content, and summarizing to enhance comprehension during reading. Finally, regulation refers to compensatory strategies used to restructure and support comprehension when errors occur in the reading process.

When metacognitive and reading processes are considered together, it becomes clear that individuals must first possess cognitive knowledge about reading. Students with adequate cognitive knowledge of reading and comprehension gain the opportunity to compare their learning processes with the expected outcomes of reading comprehension. During this process, they engage in the self-monitoring aspect of metacognition. Subsequently, when encountering difficulties or misunderstandings while reading, they self-regulate by applying new learning strategies. The key factor in this process is the ability of individuals to select and apply strategies appropriate to their learning domain, the text being read, and their personal learning needs. Only in this way can the metacognitive reading process yield more effective results.

The primary aim of this study is to examine the relationships among attitude, anxiety, self-efficacy, and metacognition, which are factors influencing reading comprehension skills. Another



objective of this research is to determine how these factors predict reading comprehension ability. The study is unique in that it integrates key variables widely studied in reading research—attitude toward reading, reading anxiety, reading self-efficacy, and metacognition—and investigates their interconnections. By examining these variables collectively, the study provides a comprehensive perspective on the factors affecting reading comprehension, ultimately leading to the development of a theoretical model.

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The main research question of this study is: "What is the relationship among attitude toward reading, reading anxiety, reading self-efficacy, and metacognition in relation to reading comprehension skills, and to what extent do these factors predict reading comprehension ability?"

Based on this research question, the following sub-questions have been formulated:

- What is the relationship among attitude toward reading, reading anxiety, reading self-efficacy, and metacognition?
  - What is the relationship between attitude toward reading and reading anxiety?
  - What is the relationship between attitude toward reading and reading self-efficacy?
  - What is the relationship between attitude toward reading and metacognition?
  - What is the relationship between reading anxiety and reading self-efficacy?
  - What is the relationship between reading anxiety and metacognition?
  - What is the relationship between reading self-efficacy and metacognition?
- To what extent do attitude, anxiety, self-efficacy, and metacognition predict reading comprehension ability?
  - To what extent does the attitude variable predict reading comprehension ability?
  - To what extent does the anxiety variable predict reading comprehension ability?
  - To what extent does the self-efficacy variable predict reading comprehension ability?
  - To what extent does the metacognition variable predict reading comprehension ability?

This study offers a holistic approach by analyzing multiple interrelated variables that impact reading comprehension. The findings will provide valuable insights into how these factors interact and contribute to students' reading success. Ultimately, the study aims to establish a predictive model for understanding the role of attitude, anxiety, self-efficacy, and metacognition in reading comprehension.

## Method

### Type of research

This study aims to examine the relationships among participants' attitude toward reading, reading anxiety, reading self-efficacy, and metacognition and determine how these variables predict reading comprehension skills. Before conducting the main study, a preliminary study was carried out, including a literature review, to develop a hypothetical model.

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The study follows a quantitative research design and adopts a correlational research method. In line with this approach, the relationships among reading attitude, reading anxiety, self-efficacy, and metacognition were analyzed. Subsequently, Structural Equation Modeling (SEM) was used to test how these variables predict reading comprehension skills and to determine whether the hypothetical model developed in the preliminary study is supported by the data.

### Hypothesis model

A preliminary study titled "A Literature Review on Factors Affecting Reading Comprehension Skills" (Demircan and Aydın, 2020) was conducted to identify the variables to be used in the study and to develop a model based on their effects on reading comprehension. Drawing from this study and the findings of the reviewed literature, a hypothesis model was proposed, as shown in Figure 1.

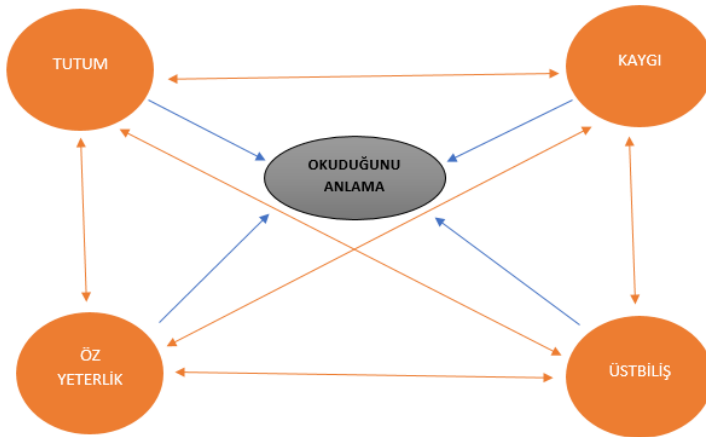


Figure 1. Hypothesis model

In Figure 1, blue arrows represent predictive relationships, while orange arrows indicate correlation levels. According to the literature review, metacognition, self-efficacy, and attitude are expected to have a positive effect on reading comprehension, whereas anxiety is anticipated to have a negative impact. Additionally, attitude, self-efficacy, and metacognition are expected to be positively correlated with each other, while these variables are expected to be negatively associated with anxiety. The model was tested through data analysis, and modifications were made based on the results obtained.

### Target group

The population of the study consists of students enrolled in middle schools affiliated with the Ministry of National Education (MEB) in İzmir. The sample includes 386 seventh-grade students who voluntarily participated in the study during the 2020–2021 academic year. These students were Demircan, U. ve Aydın, I.S. (2025). Correlation of reading attitude, anxiety, self-efficacy, metacognition factors and their predictive power on reading comprehension. *Western Anatolia Journal of Education*, 16(3), 4516-4550.



selected from public schools located in different socio-cultural regions of İzmir using the "convenience sampling" method. When determining the grade level, particular attention was given to ensuring that students were not in the preparatory period for high school entrance exams, as this could affect their anxiety levels.

### Data collection tool and process

In this study, the following instruments, whose reliability and validity had been previously established, were used: the Reading Comprehension Test (Ülper, Çetinkaya, and Bayat, 2017), the Attitude Toward Reading Scale (Uyar, 2009), the Reading Anxiety Scale (Çeliktürk and Yamaç, 2015), the Reader Self-Efficacy Scale (Ülper, Yaylı, and Karakaya, 2013), and the Metacognitive Awareness of Reading Strategies Inventory (Öztürk, 2012). The Reader Self-Efficacy Scale and the Reading Anxiety Scale are unidimensional measures. The Metacognitive Awareness of Reading Strategies Inventory is a scale adapted into Turkish and consists of three subdimensions: general reading strategies, problem-solving strategies, and support strategies for reading. The Attitude Toward Reading Scale comprises four subdimensions: free reading, books, general reading, and academic reading.

Since the data collection process was lengthy, the instruments were administered in three stages at one-month intervals. First, the Reading Comprehension Test was applied, followed by the Attitude Toward Reading Scale and the Reading Anxiety Scale. Finally, the Reader Self-Efficacy Scale and the Metacognitive Awareness of Reading Strategies Inventory were administered.

### Data analysis

The scales administered by the researcher were transferred to a digital environment using the SPSS 24 software package, with each participant assigned a subject number. Necessary adjustments were made to correct erroneous or incomplete data. Outlier analysis was conducted on the collected data, and based on standardized z-scores (using a threshold of  $\pm 3$ ), 17 participants were excluded from the dataset (Çokluk, Şekercioğlu, and Büyüköztürk, 2018). After removing these outliers, the final analyses were conducted with data from 369 participants. Since structural equation modeling (SEM) was used in the analyses, the adequacy of the sample size was considered. Various researchers have suggested that an appropriate sample size for SEM should range between 200 and 500 participants (Kline, 1998; Möbius, 2003). Therefore, the collected dataset was deemed sufficient for conducting the analyses.

For data analysis, SPSS 24, TAP, and MPLUS 8 software programs were used. To assess the validity of the scales, construct validity was examined through Confirmatory Factor Analysis (CFA). The validity of the achievement test was evaluated by calculating item statistics. To assess the reliability of the scales, Cronbach's Alpha coefficients were computed, while the reliability of the achievement test was examined using KR-20 and KR-21 coefficients. Finally, Structural Equation Modeling (SEM) was employed to investigate the relationships between students' reading anxiety,



reading attitudes, metacognitive awareness of reading strategies, and reader self-efficacy, as well as their effects on reading comprehension skills.

### Validity and reliability evidence for the scales

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#### **Validity and reliability evidence for the Reading Anxiety Scale**

To provide evidence for the construct validity of the Reading Anxiety Scale used in the study, Confirmatory Factor Analysis (CFA) was conducted on the obtained scores. The standardized factor loadings, which indicate the correlations between each observed variable and its associated latent variable, were found to range between 0.564 and 0.804.

Alternative fit indices were also used to assess the compatibility between the expected and observed covariance matrices. The fit index values and their levels of adequacy are presented in Table 1.

Table 1.  
Fit Index Values for the Reading Anxiety Scale

Fit Index	$\chi^2/df$	$p$	RMSEA	SRMR	TLI	CFI
Value	1245.924/377 = 3.305	0.000	0.079	0.049	0.863	0.873
Fit Level	Good Fit		Good Fit	Good Fit	Acceptable Fit	Acceptable Fit

When examining Table 1, it is observed that the model is statistically significant ( $p < 0.05$ ). The fit indices indicate that the model demonstrates an acceptable to good fit: The  $\chi^2/df$  ratio = 3.305 falls within an acceptable range, though values below 3.00 are considered ideal (Carmines and McIver, 1981). The RMSEA = 0.079 suggests a good fit, as values below 0.08 are indicative of good model fit (Steiger, 2007). The SRMR = 0.049 also indicates a good fit, as values  $\leq 0.08$  are considered acceptable (Brown, 2006, cited in Çokluk, Şekercioğlu, and Büyüköztürk, 2010). TLI (0.863) and CFI (0.873) approach the 0.90 threshold for good fit, though values of 0.80 and above are still considered acceptable (Tabachnick and Fidell, 2001).

To assess the reliability of the Reading Anxiety Scale, the Cronbach's alpha internal consistency coefficient was calculated based on the collected scores. The results are presented in Table 2.

Table 2.  
Cronbach's Alpha Coefficient for the Reading Anxiety Scale

	Reading Anxiety
Cronbach's Alpha	0.964
Number of Items	29

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When examining Table 2, it is observed that the Cronbach's alpha internal consistency coefficient for the 29-item scale was found to be 0.964. This indicates that the obtained scores are highly reliable (Özdamar, 2004).

### **Validity and reliability results for the Attitude Toward Reading Scale**

To provide evidence for the construct validity of the Attitude Toward Reading Scale used in the study, Confirmatory Factor Analysis (CFA) was conducted. The standardized factor loadings, which indicate the correlations between each observed variable and its associated latent variable, were found to range between: 0.430 – 0.753 for the Free Reading factor, 0.327 – 0.738 for the Books factor, 0.610 – 0.721 for the General Reading factor, 0.416 – 0.665 for the Academic Reading factor.

Alternative fit indices were also used to assess the compatibility between the expected and observed covariance matrices. The fit index values and their levels of adequacy are presented in Table 3.

Table 3.  
Fit Index Values for the Attitude Toward Reading Scale

Fit Index	$\chi^2/df$	<i>p</i>	RMSEA	SRMR	TLI	CFI
Value	696.454/271 = 2.570	0.000	0.065	0.072	0.848	0.863
Fit Level	Good Fit		Good Fit	Acceptable Fit	Acceptable Fit	Acceptable Fit

When examining Table 3, it is observed that the model is statistically significant ( $p < 0.05$ ). The fit indices indicate that the model demonstrates an acceptable to good fit:

The  $\chi^2/df$  ratio = 2.570 falls within the good fit range, as values below 3.00 indicate strong model fit (Carmines and Mclver, 1981). The RMSEA = 0.065 is below the 0.08 threshold, suggesting a good fit (Steiger, 2007). The SRMR = 0.072 is within the acceptable range ( $\leq 0.08$ ), indicating a good fit (Brown, 2006, cited in Çokluk, Şekercioğlu and Büyüköztürk, 2010). TLI (0.848) and CFI (0.863) are slightly below the 0.90 threshold for a good fit, but values above 0.80 are still considered acceptable (Tabachnick and Fidell, 2001). These findings suggest that the Attitude Toward Reading Scale has an acceptable to good level of construct validity.

To assess the reliability of the Attitude Toward Reading Scale, Cronbach's alpha internal consistency coefficients were calculated based on the collected scores. The results are presented in Table 4.



Table 4.  
Cronbach's Alpha Coefficients for the Attitude Toward Reading Scale

	Free Reading	Books	General Reading	Academic Reading	Attitude
Cronbach's Alpha	0.813	0.776	0.817	0.718	0.895
Number of Items	7	8	6	4	25

Table 4 shows that the Cronbach's alpha internal consistency coefficient for the 7 items in the free reading factor is 0.813, for the 8 items in the books factor is 0.776, for the 6 items in the general readings factor is 0.817, and for the 6 items in the academic reading factor is 0.718. The overall Cronbach's alpha internal consistency coefficient for the 25-item scale is found to be 0.895. When these values are examined, it is evident that the obtained scores are quite reliable (Özdamar, 2004).

#### **Results of confirmatory factor analysis and reliability test for the Reading Metacognition Scale**

To obtain evidence regarding the construct validity of the Reading Metacognition Scale used in the study, confirmatory factor analysis was applied to the obtained scores. The standardized factor loading values showing the correlations between each observed variable and the latent variable to which it is related ranged from 0.449 to 0.662 for the general reading strategy factor, from 0.483 to 0.587 for the problem-solving strategy factor, and from 0.447 to 0.665 for the reading strategies support factor.

Alternative fit indices are also used to examine the fit between the expected and observed covariance matrices. The fit index values and adequacy levels of the scale are presented in Table 5.

Table 5.  
Fit Index Values of the Reading Metacognition Scale

Fit Index	$\chi^2/sd$	$p$	RMSEA	SRMR	TLI	CFI
Value (743.379/402)	1.849	0.000	0.048	0.046	0.898	0.906
Fit	Good	Good	Good Fit	Good	Good	Good

When examining Table 5, it is observed that the model is statistically significant ( $p < 0.05$ ). The fit indices indicate that the model demonstrates an acceptable to good fit: The  $\chi^2/df$  ratio = 2.570 falls within the good fit range, as values below 3.00 indicate strong model fit (Carmines and McIver, 1981). The RMSEA = 0.048 is below the 0.08 threshold, suggesting a good fit (Steiger, 2007). The SRMR = 0.046 is within the acceptable range ( $\leq 0.08$ ), indicating a good fit (Brown, 2006, cited in Çokluk, Şekercioğlu and Büyüköztürk, 2010). TLI and CFI values above 0.80 indicate good fit (Tabachnick and Fidell, 2001).



To obtain evidence for the reliability of the Metacognitive Reading Strategies Scale used in the study, Cronbach's alpha internal consistency coefficients were calculated based on the obtained scores. The results are presented in Table 6.

Table 6.  
Cronbach's Alpha Internal Consistency Coefficients for the Metacognitive Reading Strategies Scale

	General Reading Strategy	Problem-Solving Strategy	Support for Reading Strategies	Metacognition
Cronbach's Alpha	0.808	0.797	0.868	0.932
Madde Sayısı	8	9	13	30

### **Confirmatory factor analysis and reliability test results for the Reading Self-efficacy Scale**

To obtain evidence for the construct validity of the Reading Self-efficacy Scale used in the study, Confirmatory Factor Analysis (CFA) was conducted. The standardized factor loadings, which indicate the correlations between each observed variable and its associated latent variable, were found to range between 0.382 and 0.672 for the Reading Self-Efficacy Scale.

Alternative fit indices were also used to assess the compatibility between the expected and observed covariance matrices. The fit index values and their levels of adequacy are presented in Table 7.

Table 7.  
Fit Index Values for the Reading Self-efficacy Scale

Fit Index	$\chi^2/df$	P	RMSEA	SRMR	TLI	CFI	AIC
Value	(1502.581/594) 2.529	0.000	0.064	0.058	0.810	0.821	34437.448
Fit	Good Fit	Good Fit	Good Fit	Good Fit	Good Fit	Good Fit	—

When Table 7 is examined, it is observed that the model is statistically significant ( $p < 0.05$ ). The fit indices in the table indicate that  $\chi^2/df = 2.529$ , and the calculated  $\chi^2/df$  value ( $< 3.00$ ) meets the good fit criterion (Carmines and Mclver, 1981). Additionally, RMSEA = 0.064, which satisfies the good fit criteria ( $< 0.08$ ) (Steiger, 2007), and SRMR = 0.058, which also meets the good fit threshold ( $\leq 0.08$ ) (Brown, 2006; cited in Çokluk, Şekercioğlu and Büyüköztürk, 2010). TLI and CFI values above 0.80 indicate a good fit (Tabachnick and Fidell, 2001).

To assess the reliability of the Reading Self-Efficacy Scale used in the study, Cronbach's alpha internal consistency coefficients were calculated based on the obtained scores. These results are presented in Table 8.



Table 8.  
Cronbach's Alpha Internal Consistency Coefficients for the Reading Self-efficacy Scale

	Reading Self-efficacy
Cronbach's Alpha	0.933
Number of Items	36

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When Table 8 is examined, it is observed that the Cronbach's alpha internal consistency coefficient for the 36-item scale is 0.933. This indicates that the obtained scores are highly reliable (Özdamar, 2004).

### **Item statistics and reliability results of the Reading Comprehension Ability Test**

To obtain evidence for the validity of the Reading Comprehension Ability Test used in the study, item analysis was conducted based on the obtained scores. The item statistics for the Reading Comprehension Achievement Test are presented in Table 9.

Table 9.  
Item Statistics for the Reading Comprehension Ability Test

Items	Number of Correct Respondents	Item Difficulty	Item Discrimination	Correct Responses from Upper Group	Correct Responses from Lower Group	Point-Biserial Correlation
1st Item	310	0.84	0.31	106	72	0.41
2nd Item	285	0.77	0.32	100	64	0.40
3rd Item	345	0.94	0.17	109	90	0.37
4th Item	222	0.60	0.64	98	28	0.52
5th Item	201	0.55	0.27	75	45	0.31
6th Item	158	0.43	0.51	78	22	0.44
7th Item	90	0.24	0.16	38	20	0.16
8th Item	234	0.64	0.46	91	41	0.36
9th Item	176	0.48	0.40	75	31	0.34
10th Item	62	0.17	0.11	26	14	0.08
11th Item	104	0.28	0.47	63	12	0.40
12th Item	88	0.24	0.04	21	25	0.01
13th Item	171	0.46	0.36	71	32	0.31
14th Item	185	0.50	0.54	83	24	0.41
15th Item	136	0.37	0.38	62	20	0.33
16th Item	247	0.67	0.55	97	37	0.50
17th Item	184	0.50	0.62	95	37	0.48
18th Item	192	0.52	0.60	87	21	0.49
19th Item	199	0.54	0.71	95	17	0.58
20th Item	263	0.71	0.67	106	33	0.61
21st Item	222	0.60	0.66	100	28	0.57
22nd Item	272	0.74	0.49	105	51	0.47
23rd Item	120	0.33	0.40	58	14	0.35

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24th Item	158	0.43	0.45	70	21	0.35
25th Item	66	0.18	0.38	43	2	0.38
26th Item	283	0.77	0.66	107	35	0.67
27th Item	289	0.79	0.55	105	45	0.60
28th Item	291	0.79	0.34	100	62	0.38

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Average Item Difficulty: 0.539	Arithmetic Mean: 15.090
Average Item Discrimination: 0.433	Standard Deviation: 5.106
Maximum Obtainable Score: 28	Variance: 26.071
Minimum Obtainable Score: 0	Skewness: -0.454
Kurtosis: -0.348	

In Table 9, the item difficulty, item discrimination, the number of correct respondents for each item, the number of correct responses from the upper group, the number of correct responses from the lower group, and the point-biserial correlation coefficients for each item are provided. The item difficulties in the achievement test range between 0.17 and 0.94, indicating that the test contains items of varying difficulty levels. The item discrimination values in the achievement test range between 0.04 and 0.71, showing variability in the ability of items to differentiate between high- and low-performing individuals. The average item difficulty of the test was found to be 0.539, and since this value is around 0.50, it suggests that the difficulty level of the test items is appropriate (Tan and Erdoğan, 2004). The average item discrimination value was found to be 0.433, and as it exceeds 0.40, this indicates that the test has a high level of item discrimination (Baykul, 2000). The standard deviation of the scores obtained from the achievement test was 5.106, with a mean score of 15.090.

To obtain evidence of the reliability of the Reading Comprehension Ability Test used in this study, the KR20 and KR21 internal consistency coefficients calculated from the obtained scores are presented in Table 10.

Table 10.

KR20 and KR21 Internal Consistency Coefficients for the Reading Comprehension Ability Test

Class	KR20	KR21
Ability Test	0.808	0.760
Number of Items	28	28

When Table 10 is examined, it is observed that the KR-20 internal consistency coefficient of the achievement test is 0.808, while the KR-21 internal consistency coefficient is 0.760. These values indicate that the scores obtained from the achievement test are highly reliable (Özdamar, 2004).



## Descriptive statistics of the measurement instruments used

Table 11.  
Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Reading Comprehension Skill	369	1.00	27.00	15.103	5.108
Attitude Towards Reading	369	45.00	122.00	89.965	14.006
Reading Metacognition	369	40.00	150.00	103.523	21.240
Reading Anxiety	369	29.00	136.00	59.697	26.179
Reading Self-Efficacy	369	75.00	176.00	136.840	20.345

When Table 11 is examined, it is observed that the students' mean scores are as follows: reading comprehension skill ( $\bar{X}=15.103$ ), attitude towards reading ( $\bar{X}=89.965$ ), reading metacognition ( $\bar{X}=103.523$ ), reading anxiety ( $\bar{X}=59.697$ ) and reading self-efficacy ( $\bar{X}=136.840$ ).

## Findings

This section presents the findings obtained from the study and their interpretations.

### Relationships and structural equation model results

Structural equation modeling was conducted to examine the accuracy of the hypotheses formulated to investigate the effects of scores obtained from the Reading Self-Efficacy, Reading Anxiety, Attitude Towards Reading, and Reading Metacognition Scales on the scores obtained from the Reading Comprehension Achievement Test, as well as the relationships among these scores.

### Results regarding the first sub-problem statement

The results regarding the relationships among the scores obtained from the Reading Self-Efficacy, Reading Anxiety, Attitude Towards Reading, and Reading Metacognition Scales are presented in Table 12.

Table 12.  
Correlations Among Variables

Variable	Anxiety	Attitude	Metacognition	Self-efficacy	Reading Comprehension	Variable
Anxiety	1	-0.365**	-0.179**	-0.345**	-0.285**	Anxiety
<i>p</i> -value	-	0.000	0.001	0.000	0.000	<i>p</i> -value
<i>N</i>	369	369	369	369	369	<i>N</i>
Attitude	-	1	0.396**	0.477**	0.216**	Attitude
<i>p</i> -value	-	-	0.000	0.000	0.000	<i>p</i> -value
<i>N</i>	-	369	369	369	369	<i>N</i>
Metacognition	-	-	1	0.454**	0.035	Metacognition

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<i>p</i> -value	-	-	-	0.000	0.508	<i>p</i> -value
<i>N</i>	-	-	369	369	369	<i>N</i>
Self-efficacy	-	-	-	1	0.311**	Self-Efficacy
<i>p</i> -value	-	-	-	-	0.000	<i>p</i> -value
<i>N</i>	-	-	-	369	369	<i>N</i>
Reading	-	-	-	-	1	Reading
Comprehension	-	-	-	-	-	Comprehension
<i>p</i> -value	-	-	-	-	-	<i>p</i> -value
<i>N</i>	-	-	-	-	369	<i>N</i>

Note:  $p < 0.01$  (significant at the 0.01 level).

When Table 12 is examined, it is observed that there are statistically significant negative correlations at different levels between students' reading anxiety and other variables: a moderate negative correlation with attitude towards reading ( $r=-0.365$ ,  $p<0.01$ ), a moderate negative correlation with reading self-efficacy ( $r=-0.345$ ,  $p<0.01$ ), a low negative correlation with reading metacognition ( $r=-0.179$ ,  $p<0.01$ ), and a low negative correlation with reading comprehension skill ( $r=-0.285$ ,  $p<0.01$ ).

Furthermore, statistically significant positive correlations were found between students' attitude towards reading and other variables: a moderate positive correlation with reading metacognition ( $r=0.396$ ,  $p<0.01$ ), a moderate positive correlation with reading self-efficacy ( $r=0.477$ ,  $p<0.01$ ), and a low positive correlation with reading comprehension skill ( $r=0.216$ ,  $p<0.01$ ).

A statistically significant moderate positive correlation was observed between students' reading metacognition and reading self-efficacy ( $r=0.454$ ,  $p<0.01$ ), while no statistically significant correlation was found between reading metacognition and reading comprehension skill ( $r=0.035$ ,  $p>0.01$ ).

Finally, a statistically significant low positive correlation was found between students' reading self-efficacy and reading comprehension skill ( $r=0.311$ ,  $p<0.01$ ).

### **Results regarding the second sub-problem statement**

The results regarding the extent and direction to which the factors of attitude, anxiety, self-efficacy, and metacognition related to reading comprehension predict reading comprehension skill are presented in Table 13.

Table 13.  
Correlations Regarding the Predictive Levels of Variables on Reading Comprehension Skill

Predicted Variable	Predictor Variable	<i>B</i>	Standard Error of <i>B</i>	Beta	Standard Error of Beta	<i>t</i>	<i>p</i>
Reading Comprehension	Attitude Towards	0.157	0.084	0.132	0.070	1.874	0.061

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Skill	Reading						
	Reading Anxiety	-	0.359	-0.216	0.052	4.165	0.000
		1.408					
	Reading Metacognition	-	0.052	-0.160	0.059	2.729	0.006
		0.141					
	Reading Self-efficacy	2.729	0.607	0.294	0.060	4.919	0.000

When Table 13 is examined, it is seen that attitude towards reading does not significantly predict reading comprehension skill ( $t=1.874$ ,  $p>0.05$ ). However, reading anxiety ( $t=-4.165$ ,  $p<0.05$ ), reading metacognition ( $t=-2.729$ ,  $p<0.05$ ), and reading self-efficacy ( $t=4.919$ ,  $p<0.05$ ) are found to significantly predict reading comprehension skill. When the B coefficients in the table are examined, it is observed that a one-unit increase in reading anxiety leads to a 1.408-unit decrease in reading comprehension skill. Similarly, a one-unit increase in reading metacognition results in a 0.141-unit decrease in reading comprehension skill. Conversely, a one-unit increase in reading self-efficacy causes a 2.729-unit increase in reading comprehension skill.

When the model is analyzed, it is understood that students' reading comprehension skills are predicted by their reading anxiety, reading metacognition, and reading self-efficacy. Therefore, the path between attitude towards reading and reading comprehension skill was removed from the model, and the analysis was finalized accordingly. The path diagram obtained through structural equation modeling is presented in Figure 2.

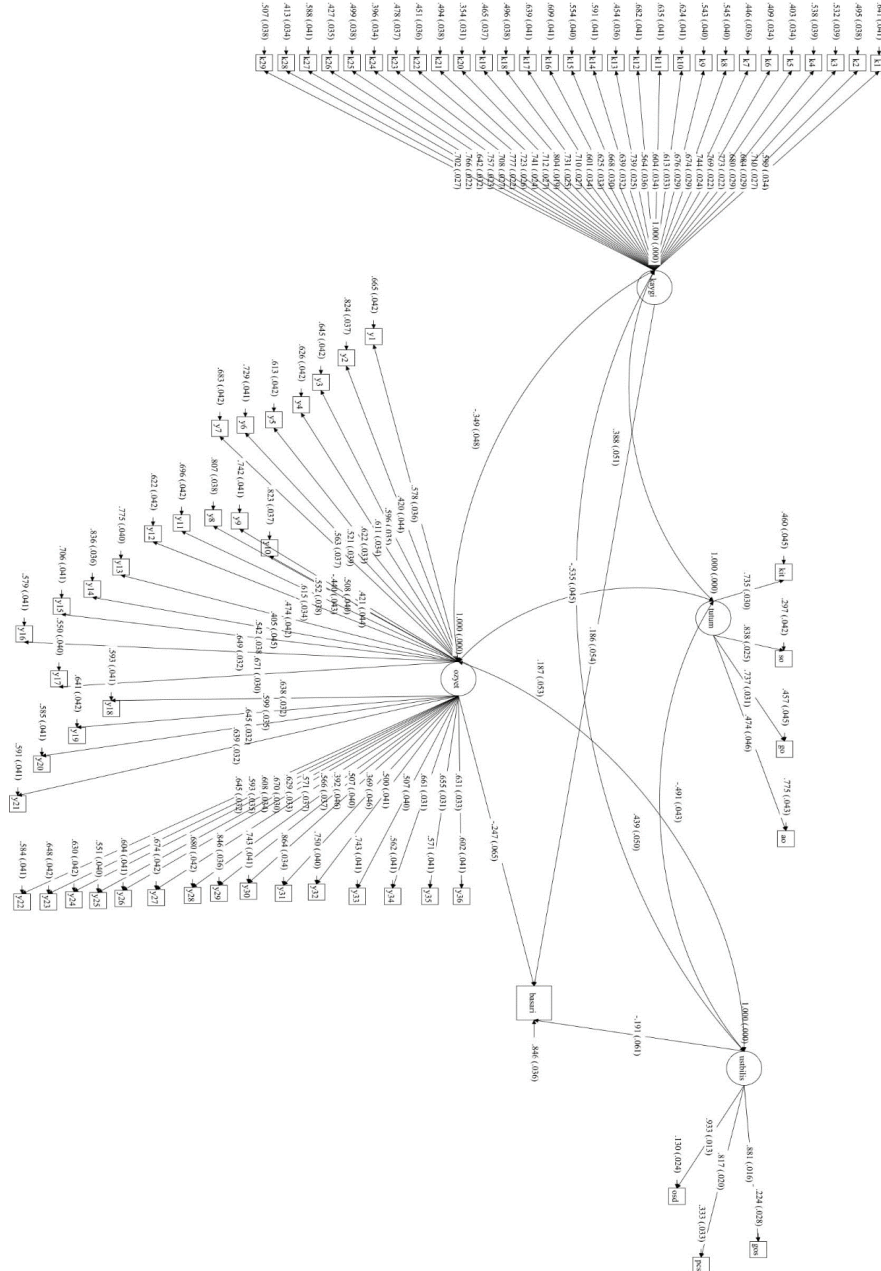


Figure 2. The path diagram of structural equation modelling

The fit indices related to the structural model that examines the effect of scores obtained from the Reading Self-Efficacy, Reading Anxiety, Attitude Towards Reading, and Reading

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Metacognition scales on the score obtained from the Reading Comprehension Achievement Test are presented in Table 14.

Table 14.  
Fit Index Values of the Structural Model

Fit Index	$\chi^2/df$ (5127.596/2547)	$p$	RMSEA	SRMR	TLI	CFI	AIC
Value	2.013	0.000	0.052	0.059	0.813	0.819	80931.753
Fit	Good Fit		Good Fit	Good Fit	Good Fit	Good Fit	

When Table 14 is examined, it is seen that the model is statistically significant ( $p=0.000$ ,  $p<0.05$ ). Regarding the fit indices, the  $\chi^2/df$  value is 2.013, which meets the good fit criterion of being less than 3.00 (Carmines and McIver, 1981). The RMSEA value is 0.052, which satisfies the good fit criterion of being below 0.08 (Steiger, 2007). Similarly, the SRMR value is 0.059, which also falls within the acceptable range for good fit ( $\leq 0.08$ ), as suggested by Brown (2006, cited in Çokluk, Şekercioğlu and Büyükoztürk, 2010). Moreover, TLI and CFI indices with values of 0.813 and 0.819 respectively indicate a good model fit, as values of 0.80 and above are considered indicative of good fit (Tabachnick and Fidell, 2001; Kline, 1998).

## Discussion, Conclusion, and Recommendations

When the results of the correlation analysis obtained from the study are examined, it is observed that there is a moderate negative correlation between the variables of attitude towards reading and reading anxiety. This finding is consistent with the hypothesis model of the study. Logically, it is expected that attitude, which has a positive effect on achievement, and anxiety, which has a negative effect, would demonstrate a negative relationship with each other. Dursun and Özenç (2019) found a moderate negative correlation between fourth-grade primary school students' reading anxiety and their attitudes towards the Turkish course. Due to the limited number of studies on reading attitude and anxiety, it is useful to consider research investigating the relationship between anxiety and attitude in similar fields. Coşkun and Taşgın (2018) reported that attitude and anxiety factors in foreign language learning showed a negative relationship. Similarly, Akpur (2015) found a negative correlation between students' attitudes towards English and their foreign language classroom anxiety. Kağıtçı (2014) found a moderate negative correlation between students' science anxiety and their attitudes towards the science course. Tan (2015) and Doruk et al. (2016) concluded in their studies that there is a significant negative correlation between math anxiety and attitudes towards mathematics. Serin et al. (2015) reported a moderate negative relationship between prospective classroom teachers' attitudes towards the teaching profession and their level of anxiety about the profession. The results of all these aforementioned studies support the finding of this study that there is a negative relationship between anxiety and attitude.



According to the results of the correlation analysis obtained from the study, a moderate positive relationship was found between attitude towards reading and self-efficacy. This finding is consistent with the hypothesis model of the study. Theoretically, since self-efficacy is considered to have a positive effect on academic achievement, it is expected to be positively correlated with attitude, which is another factor contributing to achievement. Innalı and Aydın (2014), in their study conducted with 8th-grade students, found a linear relationship between students' perceptions of reading self-efficacy and their attitudes. Moreover, their regression analysis revealed that attitude towards reading was a significant predictor of reading self-efficacy. Similarly, Eyüp and Uzuner Yurt (2015), in a study on middle school students, concluded that there was a significant positive relationship between students' reading attitudes and their self-efficacy regarding reading comprehension. Armut and Türkyılmaz (2018) also found a positive relationship between middle school students' perceptions of reading self-efficacy and their attitudes towards reading. Karakoç Öztürk (2015), in a study at the middle school level, concluded that students who stated that they enjoyed reading had higher levels of perceived reading self-efficacy compared to those who did not enjoy reading. In addition to studies examining the relationship between attitude and self-efficacy regarding reading comprehension, it is also beneficial to explore how these two factors relate in different fields. For instance, Tuncer and Akmençe (2019), in a study conducted with high school students, found through multiple regression analysis that attitude towards a foreign language explained 40.6% of the variance in foreign language self-efficacy. Likewise, Doruk et al. (2016) found a significant positive relationship between middle school students' attitudes towards mathematics and their mathematics self-efficacy. The results of these aforementioned studies appear to support the findings of the present study.

According to the results of the correlation analysis obtained from the study, a moderate positive relationship was found between attitude towards reading and metacognitive factors. This finding is seen to be consistent with the hypothesis model of the study. Theoretically, researchers suggest that metacognitive awareness has a positive effect on academic achievement; therefore, it is expected that metacognition, which positively affects achievement, would also be positively correlated with another variable that supports success: attitude. Kandemir and Demiroğlu Memiş (2019), in their study conducted with fifth-grade students, found a low-level but significant positive correlation between metacognitive reading awareness and attitude towards reading. This result supports the finding within the scope of the current study that attitude and metacognitive factors are positively correlated. Edizer (2015), in a study with Turkish language teacher candidates, concluded that there was a significant positive relationship between the candidates' attitudes towards reading books and their level of using metacognitive reading strategies. The relationship between attitude and metacognition has also been the subject of studies in different language skills: Meral (2019), in a study with fourth-grade primary school students, found a high-level positive relationship between students' metacognitive listening awareness and their attitudes towards listening. In an experimental study conducted by Küçükakça (2021) with sixth-grade students, an eight-week metacognitive strategy training was implemented. As a result, it was found that metacognitive strategy instruction in mathematics did not affect students' attitudes towards the mathematics course. This result may have been influenced by the effectiveness of the instruction,

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the duration of the intervention, and the characteristics of the sample group. It is notable that there is a growing body of opinions and studies suggesting a relationship between metacognitive and attitudinal variables.

According to the results of the correlation analysis obtained from the study, a moderate negative relationship was found between reading anxiety and self-efficacy. This finding is consistent with the hypothesis model of the study. It is expected that self-efficacy, which has a positive effect on achievement, and anxiety, which has a negative effect, would show a negative relationship. According to social cognitive theory, as a result of a student's low perception of self-efficacy in a particular academic subject, the student becomes anxious in that academic area. Social cognitive theory suggests that anxiety is one of the four sources of self-efficacy (Bandura, 1986, 1997). Therefore, anxiety can be said to play a role both as a source and as an influential factor in self-efficacy perception. Ghonsooly and Elahi (2010) found a significant negative relationship between students' reading self-efficacy in their native language and their reading anxiety in a foreign language. Since studies examining the relationship between reading comprehension self-efficacy and anxiety are limited, it is useful to look at studies that explore the relationship between these two factors in different fields. Cheng (2001) stated that as students' anxiety towards foreign languages increased, their self-efficacy in the same area decreased, indicating a negative relationship between the two factors. Similarly, Woodrow (2001) concluded that there is a negative relationship between anxiety and self-efficacy in foreign language learning. Erkan and Saban (2011) also found a negative relationship between writing anxiety and writing self-efficacy in a foreign language. There are also other studies in the literature that support the conclusion that anxiety and self-efficacy have a negative relationship in various domains (Mills et al., 2006; Noghabi, 2012; Tsai, 2013; Kağıtçı, 2014; Doruk et al., 2016).

According to the results of the correlation analysis obtained from the study, a low-level negative relationship was found between reading anxiety and metacognitive awareness. This finding is consistent with the hypothesis model of the study. It is an expected outcome that there would be a negative relationship between anxiety, which has a negative effect on achievement, and metacognitive awareness, which positively influences achievement. Schraw (2002) states that students who possess metacognitive awareness experience less anxiety and are generally more successful (as cited in Kalemkuş, 2021, p. 476). In a study conducted by Melanlıoğlu (2014b) on sixth-grade students, the experimental group received eight weeks of metacognitive reading instruction. As a result, a significant reduction in reading anxiety was observed both within the experimental group (comparing pre-test and post-test scores) and when compared to the control group. No significant difference was observed in the control group's pre- and post-test scores, which did not receive metacognitive reading instruction. This outcome supports the finding in this study that there is a negative relationship between anxiety and metacognition. There are also studies that examine the relationship between anxiety and metacognition in different fields. Ekenel (2005) found no significant relationship between high school senior students' test anxiety levels and their ability to use metacognitive learning strategies. Akdağ (2014), on the other hand, in a study conducted with prospective primary school teachers, found a significant positive relationship between their levels of

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math anxiety and metacognitive awareness. In a similar study, Öztürk and Serin (2020) found a negative relationship between the metacognitive awareness of undergraduate primary education students and their anxiety about teaching mathematics. Although a generally negative relationship between anxiety and metacognitive variables is observed in the literature, it is noteworthy that some studies found no significant relationship or even a positive one. This situation may be related to the characteristics of the sample groups, the specific skills that the variables target, or the analysis methods used in the studies.

According to the results of the correlation analysis obtained from the study, a moderately positive relationship was found between students' perceptions of reading self-efficacy and their metacognitive awareness. This finding is consistent with the hypothesis model of the study. It is an expected outcome that two variables known to have a positive effect on academic achievement—self-efficacy and metacognition—would also be positively correlated with each other. Bakracevic Vukman and Licardo (2010) stated that self-regulation skills and self-efficacy perceptions are effective in the development of metacognitive skills. This view is supported by various other findings in the literature. Bağcı and Ünveren (2020), in their study with eighth-grade students, found that students who used metacognitive reading strategies had higher perceptions of reading self-efficacy. Bedir and Dursun (2022) found a significant relationship between high school students' metacognitive awareness in English reading skills and their self-efficacy in English. Studies conducted in different fields and with different skills also support the relationship between self-efficacy and metacognitive skills. Kahramanoğlu and Deniz (2017) found a moderate, positive, and significant relationship between middle school students' metacognitive skill scores and their mathematics self-efficacy scores. Koç and Arslan (2017) found a moderate, positive relationship between middle school students' academic self-efficacy perceptions and the planning, organizing, and evaluating sub-dimensions of their reading strategy metacognitive awareness. Similarly, Oğuz and Kutlu Kalender (2018) found that middle school students' general metacognitive awareness was highly positively related to their academic self-efficacy, moderately positively related to their social self-efficacy, moderately positively related to their emotional self-efficacy, and highly positively related to their total self-efficacy perceptions. In a study conducted in Morocco with university psychology students, those who received metacognitive strategy instruction showed significant differences in their self-efficacy perceptions (Bouchkioua, 2021, as cited in Sayiner, 2022). Likewise, Bozgün and Pekdoğan (2018) found in their study with middle school students that self-efficacy perception was a predictor of metacognition based on the results of a multiple regression analysis.

According to the results of the structural equation model obtained in this study, it is observed that attitude does not predict reading comprehension success, and this result is not consistent with the hypothesized model. This result should be evaluated together with the effects of other dependent variables within the context of the model. Ürün Karahan and Taşdan (2016) reached a similar result using the multiple regression analysis method and stated that attitude does not predict reading comprehension success. Başaran (2021), on the other hand, concluded in a model using regression analysis that attitude towards reading is effective on surface and deep reading comprehension. It can be thought that the different results reached in the literature through

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regression or model analysis stem from the differences in the models used. According to the results of the correlation analysis obtained from the study, it is observed that there is a low-level positive relationship between attitude and reading comprehension. This result is consistent with the hypothesized model. Many studies in the literature indicate that attitude and reading comprehension show a positive relationship; in other words, as the attitude towards reading increases, the level of reading comprehension also increases. Sallabaş (2008) concluded that there is a low-level positive relationship between the reading attitudes and reading comprehension scores of eighth-grade students; Balcı (2009) found a low-level positive relationship between the reading attitudes and reading comprehension scores of eighth-grade students; Karabay and Kuşdemir Kayıran (2010) concluded that there is a low-level positive relationship between the reading attitudes and reading comprehension scores of fifth-grade students. Contrary to these results, Kandemir and Demiroğlu Memiş (2019) concluded in a study conducted on fifth-grade students that there is no significant relationship between reading comprehension and attitude. It is thought that this variation in the correlation results in the literature may arise from the characteristics of the sample group or the differences in the measurement tools used.

In the structural equation model, it was concluded that anxiety is a negative predictor of reading comprehension. At the same time, according to the results of the correlation analysis obtained from the study, a low-level, negative, and significant relationship was found between reading anxiety and reading comprehension. These results are consistent with the hypothesized model of the study. Many studies in the literature indicate that there is a negative relationship between anxiety and reading comprehension; in other words, high levels of anxiety negatively affect the level of reading comprehension (Katrancı and Kuşdemir, 2016; Altunkaya and Erdem, 2017; Yamaç and Çeliktürk Sezgin, 2018; Türkben, 2020; Aygün, 2021). The result obtained in the study is seen to be in line with the findings of these studies in the literature. A high level of anxiety leaves less cognitive space available for performance. This negatively affects the brain's capacity for comprehension, thereby adversely influencing the reading process (Carpenter et al., 1995). Accordingly, as reading anxiety increases, an individual's level of reading comprehension is negatively affected (Murray and Janelle, 2003). It is observed that the results obtained through both correlation analysis and the structural equation model regarding the effect of anxiety on reading comprehension are supported both theoretically and by the results of various studies.

According to the results obtained from the structural equation model, the perception of reading self-efficacy positively predicts reading comprehension. At the same time, the results of the correlation analysis conducted in the study revealed a low-level positive relationship between the perception of reading self-efficacy and reading comprehension skills. These results are consistent with the hypothesized model of the study. Many studies have shown that self-efficacy perception affects an individual's performance (Gordon et al., 1998; Tschannen et al., 1998; Henson, 2001; Skaalvik and Skaalvik, 2014; Dicke et al., 2014). Numerous studies in the literature indicate that self-efficacy is positively associated with reading comprehension; in other words, as the level of reading self-efficacy perception increases, the level of reading comprehension also increases (Solheim, 2011; İnnalı and Aydın, 2014; Erdem et al., 2017; Altunkaya, 2018; Ülper and Şirin, 2019). The results

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obtained in this study are seen to be in harmony with the findings of the aforementioned studies in the literature. There are also studies indicating that self-efficacy plays an effective role in reading in a foreign language (Mills, 2006; Naseri and Zaferanieh, 2012; Erdem et al., 2017). Although limited in number, there are also studies that report results contrary to these findings, indicating that there is no significant relationship between reading self-efficacy and reading comprehension. In a study by Carroll and Fox (2017) examining the relationship between self-efficacy, word reading, and reading comprehension, it was found that while there was a relationship between reading self-efficacy and word reading, no relationship was found between reading self-efficacy and reading comprehension for either girls or boys. The researchers noted that this result may point to certain issues related to the measurement of reading self-efficacy. Similarly, Corkett et al. (2011) argued that some studies demonstrating a positive relationship between self-efficacy and reading (e.g., Shell et al., 1995; Solheim, 2011) are not consistent. They asserted that only one of these studies (Solheim, 2011) actually explained cognitive skills related to reading, while the others used different reading motivation and self-efficacy measures. It is also noted that the scales used in these studies include items that reflect self-concept rather than self-efficacy (e.g., "I am a good reader": Solheim, 2011), making it difficult to obtain clear results. Sakız (2013: 188–199) stated that the concept of self-efficacy is often confused with other constructs and that this confusion leads to problems in scale development studies. It is an acceptable view that the inability of some researchers to clearly distinguish the aspects of self-efficacy from related concepts such as self-concept, motivation, self-esteem, self-confidence, and self-regulation negatively affects the validity of measurement tools and research studies; however, it cannot be claimed that this issue affects the results of all studies. The theoretical view that high self-efficacy positively influences achievement is widely accepted, and this view is also supported by the findings of the studies mentioned above.

According to the results of the correlation analysis conducted in the study, no statistically significant relationship was found between metacognitive awareness and reading comprehension. However, the result of the structural equation modeling revealed a negative relationship between the two variables. This finding does not align with the hypothesized model of the study. Many studies in the literature have reported a positive relationship between the level of metacognitive awareness and reading comprehension, in other words, as the level of metacognitive awareness increases, so does the level of reading comprehension (Şeflek Kovacıoğlu, 2006; Anastasiou and Griva, 2009; Karabay and Kuşdemir Kayıran, 2010; Tavakoli, 2014; Tunde–Awe, 2014; Zahra et al., 2016; Kandemir and Demiroğlu Memiş, 2019). However, contrary to this, there is also a considerable number of studies that found no significant relationship between metacognition and reading comprehension (Hollingsworth and Reutzell, 1990; Başaran, 2013; Meniado, 2016; Ürün Karahan and Daştan, 2016). The inconsistent results found in these studies bring to mind the ongoing discussions in the literature regarding the measurement of metacognitive skills. The fact that metacognition cannot be directly measured negatively affects the reliability of the assessment and evaluation processes. Whitebread et al. (2009) stated that in self-report-based methods, the results may be influenced by verbal expression skills, while in think-aloud methods, implicit processes may be inadequately captured. Furthermore, especially in younger participants, the lack of awareness of their own cognitive knowledge and monitoring may lead to underestimation in measurement. The complex nature of

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metacognition and its composition of multiple processes also pose challenges for the assessment and evaluation stages. According to Lai (2011), the complexity of metacognition, its unobservable nature, its potential confusion with verbal ability and metacognitive memory skills, and the narrow focus of existing tools make its assessment and evaluation particularly difficult.

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Saraç (2010) found that metacognitive monitoring and metacognitive skills, together with general intelligence, made a significant contribution to the variance in reading comprehension levels, whereas metacognitive knowledge alone did not contribute to the variance in reading comprehension. This result is important in that it highlights the distinction between possessing metacognitive knowledge and being able to transform it into a skill and apply it during reading processes. Additionally, Kahramanoğlu and Deniz (2017), in a regression model where metacognition and self-efficacy factors were jointly examined in predicting mathematics achievement, concluded that metacognitive skills did not significantly predict mathematics achievement, while self-efficacy did. The findings of these studies support the result of the present study by indicating that metacognitive skills alone may not influence performance.

## Conclusion

In this study, the effects of attitude, anxiety, self-efficacy, and metacognitive factors on reading comprehension were investigated in order to better understand the processes of reading and reading comprehension, which are considered the foundation of academic skills. The results obtained from the analysis of the data collected from the sample group were compared with findings from similar studies in the literature, and a general conclusion was sought. In order to gain a more comprehensive understanding of the nature and components of reading comprehension skills, the metacognitive factor was included in the study alongside affective factors such as attitude, anxiety, and self-efficacy, with the aim of holistically revealing the relationships among these variables.

According to the findings obtained from the study, a positive relationship was found among the variables of attitude, self-efficacy, and metacognition, while a negative relationship was observed between these variables and anxiety. Reading comprehension skills were found to have a positive relationship with attitude and self-efficacy, a negative relationship with anxiety, and no significant relationship with metacognition. In the constructed structural equation model, it was concluded that anxiety and metacognition negatively predicted reading comprehension skills, self-efficacy positively predicted it, and attitude did not predict it.

During the literature review conducted as part of the research process, it was observed that there were certain difficulties and ensuing debates regarding the measurement of affective characteristics. It can be stated that, in measuring affective characteristics, it is first necessary to clearly define the scope of the concept to be measured and to delineate its boundaries well in order to avoid confusion with other concepts. Careful studies in this regard will enhance the quality of scale development studies and will lead to more accurate results in the measurement and evaluation processes in which the scale is used. Considering that affective characteristics are likely to be

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influenced by an individual's current state, it would be beneficial to conduct the measurement process over multiple administrations. This is particularly relevant in the case of anxiety, where both state (momentary) anxiety and general anxiety concepts are encountered. Consequently, it is possible that averaging measurements taken at different times may yield more accurate results when measuring other affective characteristics as well. The measurement of the metacognitive construct, like affective characteristics, also entails certain difficulties due to the inability to measure it directly and its complex nature, as it encompasses various processes. Furthermore, when measuring the metacognitive construct, clearly distinguishing it from abilities such as working memory and verbal ability will increase the reliability of the studies.

### Recommendations

Based on the findings of the study, the following recommendations are offered to the literature and researchers:

- An individual's reading comprehension skills significantly affect academic success in many areas. Therefore, problems related to reading and comprehension should be identified and addressed as early as possible through targeted interventions.
- In developing reading comprehension skills, affective characteristics such as students' attitudes, anxiety levels, and self-efficacy should be carefully considered. It can be generalized that this approach is also applicable to other areas of education.
- Incorporating metacognitive processes into the development of reading comprehension skills is beneficial. It is important to recognize that metacognitive awareness alone is not sufficient; this awareness must be transformed into skill. In measuring metacognition, clearly defining the scope and boundaries of the concept is also essential.
- In measuring affective factors such as attitude, anxiety, and self-efficacy, the scope of the measured concept must be well understood and clearly distinguished from other similar concepts. This will enhance the validity and reliability of both the assessments and the studies that utilize them.
- Considering that affective characteristics may be influenced by an individual's emotional state, conducting multiple assessments and using the average scores may increase the likelihood of obtaining more reliable results.
- Testing different models that include various variables affecting the reading and comprehension process would contribute to a deeper understanding of reading comprehension. Therefore, further studies should explore alternative models.



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