**Psikoloji Çalışmaları**
**Studies in Psychology**

İSTANBUL UNIVERSITY PRESS

Psikoloji Çalışmaları - Studies in Psychology Cilt/Volume: 43, Sayı/Issue: 1, 2023
DOI: 10.26650/SP2021-1050551 Research Article/Araştırma Makalesi

# Epistemic Curiosity Scale for Young Children: A Scale Adaptation to Turkish

## Küçük Çocuklar için Epistemik Merak Ölçeği: Türkçe Uyarlama Çalışması

Seda Saraç[1], Enisa Mede[2], Tuğba Abanoz[3]

[1]Dr., Bahçeşehir University, Faculty of Educational Sciences, Istanbul, Turkiye
[2]Dr., Bahçeşehir University, Faculty of Educational Sciences, Istanbul, Turkiye
[3]Dr., Ankara University, Faculty of Educational Sciences, Ankara, Turkiye

ORCID: S.S. 0000-0002-3899-6670;
E.M. 0000-0002-6555-5248;
T.A. 0000-0001-8905-4002

**Corresponding author/Sorumlu yazar:**
Tuğba Abanoz,
Ankara Üniversitesi Cebeci Kampüsü Eğitim Bilimleri Fakültesi, Fakülteler, Erdem Cd. No:5, Çankaya/Ankara, Türkiye
**E-mail/E-posta:**
tabanoz@ankara.edu.tr

**Submitted/Başvuru:** 29.12.2021
**Revision Requested/Revizyon Talebi:** 15.06.2022
**Last Revision Received/Son Revizyon:** 14.11.2022
**Accepted/Kabul:** 15.11.2022
**Published Online/Online Yayın:** 05.04.2023

**Citation/Atıf:** Sarac, S., Mede, E., & Sarac, S. (2023). Epistemic Curiosity Scale for Young Children: A scale adaptation to Turkish. *Psikoloji Çalışmaları - Studies in Psychology,* 43(1): 41–58.
https://doi.org/10.26650/SP2021-1050551

**ABSTRACT**

Epistemic curiosity is the desire to seek and acquire new information that motivates knowledge and exploratory behavior. While epistemic curiosity can stimulate positive feelings of interest related to novelty-seeking behavior and the intrinsic joy of discoveries (I-Type), it can also diminish unpleasant and uncertain experiences, which are associated with the feeling of being deprived of information (D-Type). Given the growing interest in epistemic curiosity and its implications in education, specific assessment tools are needed to measure early indicators of Type-I and Type-D epistemic curiosity, particularly in local contexts. In this study, the reliability and validity of the Turkish version of the I-Type/D-Type Epistemic Curiosity Scale for Young Children were investigated. The 10-item I-Type/D-Type Epistemic Curiosity Scale for Young Children was developed by Piotrowski and colleagues (2014) to assess children's epistemic curiosity based on parents' observations. The participants of the study were 636 children (F = 302; M = 334). The ages of the children ranged from 48 to 83 months ($M$ = 68.34; $SD$ = 7.96). Data were obtained from the mothers. The scale's factor structure was tested with Confirmatory Factor Analysis. The results showed that the Turkish version of the scale also has a similar two-factor (I-Type/Y-Type) structure to the original scale. Furthermore, for construct validity, zero-order correlations reported a significant positive relationship between self-regulation and I-Type and D-type epistemic curiosity, as hypothesized. Additionally, a partial correlation between curiosity type and self-regulation highlighted the divergence of two I-Type and D-Type epistemic curiosity. These findings indicated that the 10-item, two-factor I-Type/D-Type Epistemic Curiosity Scale for Young Children is reliable and valid for assessing young children's curiosity through mothers' ratings.

**Keywords**: Early childhood, preschool, epistemic curiosity, scale adaptation

**ÖZ**

Epistemik merak, bilgiyi ve keşif davranışlarını ortaya çıkaran, yeni bilgileri arama ve edinme arzusudur. Epistemik merak, yeni keşiflerden duyulan içsel haz ve yenilik arama davranışına ilişkin olumlu ilgi duygusunu tetikleyebilir (İ-Tipi) ya da bilgi yoksunluğu hissinden kaynaklanan istenmeyen ve belirsiz deneyimleri azaltabilir (Y-Tipi). Epistemik meraka artan ilgi ve bunun eğitimdeki etkileri göz önüne alındığında, özellikle yerel bağlamlarda Tip-I ve Tip-D epistemik merakın erken göstergelerini ölçmek için özel değerlendirme araçlarına ihtiyaç vardır. Bu çalışmada Küçük Çocuklar için İ-Tipi/Y-Tipi Epistemik Merak Ölçeği'nin Türkçe formunun psikometrik özellikleri sınanmıştır. Küçük Çocuklar için 10 maddelik I-Tipi/D-Tipi Epistemik Merak Ölçeği, Piotrowski ve arkadaşları (2014) tarafından ebeveynlerin gözlemlerine dayalı olarak, çocukların epistemik merakını değerlendirmek için geliştirilmiş bir ölçektir (Piotrowski ve ark., 2014). Araştırmanın katılımcıları 636 çocuktur (K = 302; E = 334). Çocukların yaşları 48 ile 83 ay arasında değişmektedir (M=68.34; SS = 7.96). Veriler annelerden elde edilmiştir. Çalışmada çocuklara ilişkin veriler anneler aracılığıyla toplanmıştır. Ölçeğin faktör yapısı Doğrulayıcı Faktör Analizi ile sınanmıştır. Analiz sonuçları, ölçeğin Türkçe formunun, orijinal ölçek ile benzer şekilde iki faktörlü (İ-Tipi/Y-Tipi) yapıya sahip olduğunu göstermiştir. Ayrıca, yapı geçerliliği için sıfır sıralı korelasyonlar, öz-düzenleme ile hem İ-Tipi hem de Y-Tipi epistemik merak arasında, varsayıldığı gibi, anlamlı pozitif ilişki olduğunu ortaya koymuştur. Ek olarak, merak türü ile öz-düzenleme arasındaki kısmi korelasyon değerleri, iki epistemik merak türünün (İ-Tipi ve Y-Tipi) farklılığını göstermiştir. Bu bulgular, iki faktörlü I-Tipi/D-Tipi Küçük Çocuklar İçin Epistemik Merak Ölçeği'nin Türkiye bağlamında meraktaki bireysel farklılıkları ölçmek için geçerli ve güvenilir olduğuna dair kanıtlar sunmuştur.

**Anahtar kelimeler**: Erken çocukluk, okul öncesi, epistemik merak, Küçük Çocuklar için İ-Tipi/Y-Tipi Epistemik Merak Ölçeği

Curiosity, the starting point of all scientific discoveries and innovations, is also a natural characteristic of young children (Jirout et al., 2018). Both humans and non-humans are inherently curious (Berlyne, 1954). Curiosity motivates the seeking of new stimuli in both humans and non-humans. However, unlike non-humans, there is a special type of curiosity that only humans have, called epistemic curiosity. Epistemic curiosity can be defined as the desire for information and knowledge that motivates people to exploratory behaviors (Berlyne, 1978). Simply put, it is the need for information and the motivation to meet this need through exploration (Grossnickle, 2016).

In the last few decades, the interest in epistemic curiosity has gradually increased, reflecting a renewed interest in the topic across a wide range of disparate disciplines (e.g. Hong et al., 2022; Ishaq et al., 2021; Tang et al., 2020; Totsune et al., 2021; Yang et al., 2020). Epistemic curiosity, a motivational construct, has been studied for a long time in psychology. Many educators and psychologists working in the field of motivation are interested in defining what curiosity is, what it entails, how it works, how it is triggered, in which situations it hides, and in which situations it manifests itself (e.g. Berlyne, 1954; Peters, 1978). Three schools of thought attempt to describe the concept of curiosity (Silvia, 2012). According to the first school of thought, curiosity is a motive that helps reduce the negativity the person feels in situations such as uncertainty, novelty, or knowledge gaps. The second school of thought considers curiosity as an intrinsic motivational source that encourages learning and exploratory behavior. The last school of thought considers curiosity as a stable characteristic that differs from person to person. Proponents of this viewpoint argue that some people are more curious than others, and this individual difference causes variation in experience and achievement among individuals (Silvia, 2012).

Litman (2005), one of the distinguished curiosity scholars, approached curiosity as a trait and developed the I-Type/D-Type Epistemic Curiosity Model by combining drive reduction and intrinsic motivation traditions. While epistemic curiosity can trigger positive feelings of i*nterest* related to seeking novelty and the intrinsic joy of discoveries (I-Type), it can also diminish unpleasant and uncertain experiences, which are related to the feeling of being *deprived* of information (D-Type) (Litman, 2008). Setting mastery-oriented goals is crucial for both I-Type and D-Type epistemic curiosity, which requires energy to discover intrinsic interests. Compared to I-Type epistemic curiosity, D-Type is also concerned with performance-approach-oriented learning goal setting,

triggering effort and persistence to reach extrinsically motivated learning goals (Litman, 2008; Richards et al., 2013).

Epistemic curiosity is the driving force for modernity, science, and innovation (Lindholm, 2018). It is the facilitator of cognitive development from an early age (Sternberg, 1994) and is also the predictor of creative performance and creative problem-solving (Hardy et al., 2017). Epistemic curiosity is also associated with well-being (Kashdan et al., 2018; Lydon-Staley et al., 2020), life satisfaction (Peterson et al., 2007), and job performance (Mussel, 2010). The lack of epistemic curiosity, however, is associated with depression (Kaczmarek et al., 2013; Lydon-Staley et al., 2020). Some researchers regard epistemic curiosity as an antecedent construct that initiates learning in children. In contrast, some researchers consider curiosity as a construct that emerges because of classroom climate and teaching methods and techniques (Kashdan et al., 2018). Aside from the debate of whether curiosity is an antecedent or a result, its importance in the learning process is well recognized (e.g., Bijvoet-van den Berg & Hoicka, 2014; Glogger-Frey et al., 2015; Hassinger-Das & Hirsh-Pasek, 2018; van Schijndel et al., 2018). Epistemic curiosity is also related to learning and teaching in many ways. It motivates learners to fill the knowledge gap. Thus, it becomes a source for the effective functioning of the learning process (Yazıcı & Kartal, 2020). Epistemic curiosity is also positively related to school achievement (Eren & Coskun, 2016; Shah et al., 2018; Tang & Salmela-Aro, 2021). Students with higher levels of epistemic curiosity tend to have mastery goals (Eren, 2009) and deeper strategies for learning (Richards et al., 2013), which leads to effective learning experiences. Therefore, the measurement of epistemic curiosity, which impacts many areas of life, is essential both for understanding the construct's nature and the causes of individual differences. Additionally, to develop learning effectiveness and achievement, triggering curiosity has the potential for early intervention. In this vein, valid and reliable tools to assess curiosity in early childhood are needed.

Considering the importance of epistemic curiosity and the elevated interest in the construct, studies on the epistemic curiosity of young children are scarce. This scarcity is largely due to the lack of tools to measure children's epistemic curiosity (Piotrowski et al., 2014). While there are two instruments recently developed to measure individual differences in I- Type and D- Type epistemic curiosity in adults (Litman & Jimerson, 2004; Litman & Spielberger, 2003), there is a need for assessment tools to measure the

early indicators of I- Type and D- Type epistemic curiosity. To put it simply, such tools should be developed based on the nature of children's cognitive development during their first years of life to gain a deeper understanding of their experiences as well as expressions about I-Type and D-Type epistemic curiosity.

There are no tools in Turkish that directly measure the individual differences in young children's curiosity yet, specifically the I- Type and D- Type factors of epistemic curiosity. Additionally, although epistemic curiosity has received substantial empirical support in research from Turkey, validation of the I-Type/D-Type Epistemic Curiosity model is crucial, particularly for younger children. Thus, this study aims to examine the reliability and validity of the Turkish version of the I-Type/D-Type Epistemic Curiosity Scale for Young Children (Piotrowski et al., 2014).

**Research on I- Type and D- Type Epistemic Curiosity: The Turkish Context**

Investigating epistemic curiosity has attracted the attention of scholars in Turkey. A recent study by Bacanlı and Türk Kurtça (2020) reported a review of the theories and related concepts of curiosity referring to previous studies. In this review, the types and functions of curiosity are examined, and the problem of measuring curiosity is highlighted. In their qualitative case study, Vardi and Demiriz (2019) interviewed ten preschool teachers to explore their perceptions of children's curiosity. The results revealed that children were curious about animals, the earth, natural events, and space. They also enjoyed science centers and science activities. Therefore, the teachers preferred to play as a method to promote children's curiosity.

Additionally, Ceylan and colleagues (2016) explored whether motivation, curiosity, and attitudes are influencing factors in the achievement of tertiary-level students with a science major. Based on the results obtained from the questionnaire, while motivation did not have a significant connection with achievement, attitude and curiosity directly affected science achievement. Eren and Coşkun (2016) examined the relationship between boredom, strategies to cope with boredom, and epistemic curiosity among high school students reporting a significant relationship between the three variables. In other words, epistemic curiosity decreased boredom while promoting boredom-coping strategies. Finally, Demirel and Coşkun (2009) aimed to find if any relationship exists between curiosity levels and demographics such as gender, faculty, university entrance scores, and achievement. The results indicated that while achievement was not a predictive fac-

tor in the curiosity levels, the other three factors were positively correlated with curiosity.

**I-Type/D-Type Epistemic Curiosity Scale for Young Children**

As mentioned earlier, there is a need for assessment tools to measure the early indicators of I- Type and D- Type epistemic curiosity. Piotrowski and colleagues (2014) developed the I-Type /D-Type Epistemic Curiosity Scale for Young Children to respond to this need. The scale was based on the adult epistemic curiosity scale developed by Litman (2008). The scale development study was conducted with a total number of 316 parents. The average age for children in their sample was 5.30 years (*SD* = 1.44). Some items of the adult scale have been adapted, and new items have been added for different manifestations of curiosity in young children. The authors reported that I-Type epistemic curiosity might manifest itself alternating between novel sources of stimulation, delight in meeting new people or things, and a preference for novelty over a thorough investigation of familiar objects. On the contrary, D-Type epistemic curiosity may manifest itself in such ways as paying close attention to and inspecting sources of intellectual stimulation, such as toys or other people's behavior. All 10 items of the scale were written around these proposed manifestations of epistemic curiosity. Confirmatory Factor Analysis showed an acceptable fit for the two-factor model of the scale and factors were highly correlated. The five items in the Interest Type Curiosity (I-Type) dimension aimed to reveal the curiosity of children arising from their interests, and the five items in the Deprivation Type Curiosity (D Type) dimension aimed to reveal the curiosity of children arising from their lack of knowledge. The internal consistency coefficients were .85 for I-Type and .80 for D-Type (Piotrowski et al., 2014).

For criterion validity, Piotrowski and colleagues (2014) calculated correlations between the I- Type epistemic curiosity and other related constructs. I-Type epistemic curiosity factor scores correlated positively to the measure of sensation seeking and negatively to the measure of shyness. No significant correlation was found between the I-Type epistemic curiosity factor and the measures of lack of inhibitory control and hyperactivity-inattention. However,, the D-Type epistemic curiosity factor correlated positively to the measure of sensation seeking and negatively to the measures of shyness, lack of inhibitory control and hyperactivity-inattention.

The aim of this study is to examine the reliability and validity of the Turkish version of the I-Type/D-Type Epistemic Curiosity Scale for Young Children. In this vein, the

scale was initially translated into Turkish for this study. The internal consistency coefficients of the I-Type/D-Type Epistemic Curiosity Scale were examined to determine its reliability. Additionally, item-total correlations were examined for item validity. Three hypotheses were tested for the study. First, the first hypothesis was that the Turkish version of the scale would reflect the two-factor structure of the original scale. The scale's conformance to the original structure was assessed by using Confirmatory Factor Analysis. Thus, our first hypothesis is as follows:

*H1*: Similar to the original scale, the Turkish version of the scale has two factors: D Type and I Type.

Second, it was hypothesized that both I-Type and D-Type epistemic curiosity would correlate positively with self-regulation. Self-regulation is the capacity to monitor and control one's attention, cognition, emotions, and behaviors to achieve one's goal (Perry et al., 2018). Specifically, self-regulation is an individual's capacity that is needed for goal-directed behavior. As epistemic curiosity involves cognitive effort to gain new knowledge, it requires attention regulation, persistence, and emotional and behavioral regulation for goal-directed behavior (Lauriola et al., 2015). Thus, second hypothesis of the study is as follows:

*H2*: Both I-Type and D-Type epistemic curiosity correlate positively with self-regulation.

Thirdly, it was hypothesized that the correlation between D-Type epistemic curiosity and self-regulation would be more pronounced than the correlation between I-Type epistemic curiosity, which corresponds to circumstances in which people do not feel they're lacking information but see an opportunity to learn something enjoyable Since D-Type is triggered when people believe they are missing knowledge that is needed to deepen their comprehension, it necessitates a high level of focus, perseverance, and cognitive effort to acquire new information. In other words, D-Type epistemic curiosity is more about goal-oriented effort and persistence (Litman, 2008; Piotrowski et al., 2014). Thus, third hypothesis of the study is as follows:

*H3*: The correlation between D-Type epistemic curiosity is higher than the correlation between I-Type epistemic curiosity and self-regulation.

## Method

### Participants

The participants of this study were 636 (F = 302; M = 334) children's mothers. Almost half of the mothers (49.1%) had a bachelor's degree, while 32.5% had a graduate degree. Mothers with associate degrees made up 9.7% of the Participants. All the remaining mothers (8%) were high school graduates. All mothers voluntarily participated in the study and were residents of Istanbul. The ages of the children ranged from 48 to 83 months ($M$ = 68.34; $SD$ = 7.96). There were 109 children (F = 53; M = 56) between 48-59 months, 260 children between 60-71 months (F = 137; M = 123), and 267 children between 72-83 months (F = 112; M = 155). There were no missing data.

### Measures

#### *I-Type/D-Type Epistemic Curiosity Scale for Young Children*

The 10-item I-Type/D-Type Epistemic Curiosity Scale for Young Children was developed by Pietrowski and colleagues (2014) to assess children's epistemic curiosity based on parents' observations. The scale consists of two factors. In the Interest Type Curiosity (I-Type) factor, there are five items targeting children's epistemic curiosity due to interest (e.g., *My child shows visible enjoyment when discovering something new.*), and in the Deprivation Type Curiosity (D Type) factor, there are five items are targeting children's epistemic curiosity due to lack of knowledge (e.g., *My child is bothered when s/he doesn't understand something and tries hard to make sense of it*). Parents rate how frequently their children exhibit the behaviors or characteristics mentioned in each item on a four-point Likert scale (1 = never; 4 = always). There are no reverse items in the scale. Higher scores indicate higher epistemic curiosity.

#### *Self-Regulation Skills Scale for Children aged 4-6 (Mother Form)*

The scale was developed by Erol and İvrendi (2018) to assess the self-regulatory skills of 4-6 year-old children based on mother ratings. The items are formulated into statements so mothers could rate their children on a five-point scale (1= never; 5=always). Higher scores indicate higher levels of self-regulation. In the original study, the internal consistency coefficient for the whole scale was .90. Internal consistency coefficients for the factors were .89 for the Attention factor, .82 for the Working Memory factor, .77 for the Inhibitory Control-Emotion factor, .75 for the Inhibitory Control-Behaviour factor (Erol & İvrendi, 2018). The correlation of the measurement tool with the Child Behavior Rating Scale was investigated for external criterion validity.

The Child Behavior Rating Scale was developed by Bronson and colleagues (1990) to measure children's self-regulation skills and was adapted into Turkish by Sezgin and Demiriz (2016). The total scores of the two measurement tools are highly correlated ($r$ = .84). The scores can be calculated on a whole-scale or factor basis. Therefore, the total scale scores were used.

**Procedure**

As the preliminary step, the researchers who developed the I-Type and D-Type Epistemic Curiosity Scale for Young Children were contacted via e-mail, and permission was obtained for the Turkish adaptation of the scale. Following the approval from the Ethics Committee of Bahçeşehir University, where two of the researchers are currently teaching, and permission from the authors of the original scale, a translation of the scale from English to Turkish was initiated (The approval document number is E-20021704-604.01.02-16779, on 07th October 2021).

For the translation of the scale, the committee approach was adopted. In this approach, experts conduct the translation collaboratively and iteratively. Several researchers recommend this approach over the back-translation approach (Behr, 2017; Douglas & Craig, 2007; Epstein et al., 2015). Following the recommendations, the researchers decided there was no need for a back-translation since the scale has plain language consisting of short statements with simple words. Therefore, the committee approach was more suitable. In this vein, three lecturers from the English Language Teaching department of the university, who are experts in English, independently translated the scale items into Turkish. After the translations were completed, these three experts congregated to discuss the translations. They prepared the final version of the scale in Turkish by examining the original English version and the three Turkish versions of the items and harmonizing the translations. This final version was further examined by two developmental psychologists and a researcher with a Ph.D. in early childhood education. After the Turkish version was finalized, two school chains located in Turkey were contacted, and the central administration agreed to contribute to this study. The electronically prepared Google forms and yes/no consent forms were emailed to the mothers of the children enrolled in those schools. Data were collected between June 1 and June 30, 2021.

**Data Analysis**

For reliability, internal consistency coefficients were calculated. For item validity and item-total, correlations were investigated. The original scale has two independent

factors: I-Type Curiosity and D-Type Curiosity. Confirmatory Factor Analysis with Maximum Likelihood Estimation was conducted to examine whether data from the Turkish sample supports this two-factor structure (*H1*). To evaluate model fit, chi-square (χ2) goodness-of-fit value, CFI, TLI, RMSEA, and SRMR fit indices were examined as recommended by Kline (2005). The general recommendation for a model's fit is a non-significant chi-square (χ 2). However, since the chi-square value is affected by the sample size, this value may be significant in the case of large samples. In such a case, a χ2/sd ratio of less than 5 is acceptable for model fit (Sümer, 2000). For evaluations of the other fit indices, criteria suggested by Hu and Bentler (1999) were used: Tucker–Lewis Index (TLI) > .90 (acceptable), Comparative Fit Index (CFI) > .90 (acceptable), standardized root mean square residual (SRMR) < 0.08, root mean square error of approximation (RMSEA) < .06. To further investigate construct validity, Pearson correlations between curiosity constructs and self-regulation were calculated (*H2* and *H3*). All analyses were conducted using SPSS 27.0.

## Results

Before proceeding with the analysis, data were screened for missing values and normality of the distribution. No missing data were detected. First, Q-Q plots and Stem-Leaf plots were examined for outliers. It was observed that there were a significant number of outliers in Item 3. However, there were no outliers in the remaining nine items. Since it was not desirable to compromise the integrity of the scale by removing an item, the analyses were carried out both with and without this item 3. Univariate kurtosis and skewness values were examined for all items, and all the values were lower than 2 for skewness and lower than 7 for kurtosis. It was decided that the distribution was normal.

For construct validity and for testing the first hypothesis that the Turkish version of the scale would reflect the two-factor structure of the original scale (*H1*), all 10 items were included in Confirmatory Factor Analysis. The chi-square ($\chi 2$) goodness of fit value was calculated as $\chi 2 = 152.46$; $df = 34$, $p = .00$. Accordingly, $\chi 2/df = 4.48$. The fit indices were as follows; TLI = .90, CFI = .93, RMSEA = .07, and SRMR= .05. The results indicated an acceptable fit. To see whether the fit indices would improve or not, the analysis was repeated with 9 items by excluding Item 3. The results of the Confirmatory Factor Analysis for 9 items also showed an acceptable fit. The chi-square ($\chi 2$) goodness of fit value was calculated as $\chi 2 = 72.66$; $df = 23$, $p = 0.00$. Accordingly, $\chi 2/df = 3.16$. The

fit indices were as follows; TLI = .95, CFI = .92, RMSEA = .06, and SRMR= .04. In this respect, the hypothesized two-factor solution of the original scale was supported for the Turkish version. Table 1 shows standardized loadings for the 2-Factor Confirmatory Model of the I-Type and D-Type Epistemic Curiosity Scale for Young Children. All factor loadings were acceptable and significant. In sum, both the model with 9 items and 10 items has acceptable fit indices. The model with 10 items, which includes Item 3, has a higher TLI value. This demonstrates that the model's fit is better in terms of TLI. Despite being lower, the CFI value is still acceptable. The values for RMSEA and SMRM are higher but still acceptable. These findings led to the decision to maintain Item 3 on the scale and to keep the scale in its initial 10-item format.

**Table 1**

*Standardized Loadings, Item-Factor Total, and Item-Total Correlations for a 2-Factor Confirmatory Model of I-Type and D-Type Epistemic Curiosity Scale for Young Children*

| | I-Type | D-Type | Item-Factor Total Correlations | Item-Total Correlations |
|---|---|---|---|---|
| 1. Çocuğum yeni şeyler ya da konular öğrenirken eğlenir. | .58 | | .68 | .60 |
| 3. Çocuğum, çevresindeki yeni şeylere ilgi duyar. | .51 | | .62 | .51 |
| 5. Çocuğum yeni öğrendiği konular hakkında konuşmaktan hoşlanır. | .57 | | .71 | .55 |
| 7. Çocuğum yeni bir şey keşfederken gözle görülür bir zevk alır. | .61 | | .70 | .61 |
| 9. Çocuğum yeni bir şey öğrendiğinde konuyla ilgili birçok soru sorar. | .66 | | .72 | .65 |
| 2. Çocuğum, zor bir sorunla karşılaştığında, tüm dikkati ile o sorunu çözmeye odaklanır. | | .59 | .72 | .63 |
| 4. Çocuğum, kafa karıştırıcı ya da belirsiz şeyleri anlamak için ciddi bir çaba gösterir. | | .69 | .73 | .71 |
| 6. Çocuğum bir şeyi anlamadığında rahatsız olur ve onu anlamak için epey uğraşır. | | .61 | .70 | .66 |
| 8. Çocuğum, cevabı bilmek istediğinden, bir sorunu çözmek için saatlerce çalışır. | | .62 | .74 | .66 |
| 10. Çocuğum olayları her açıdan dikkatle inceler. | | .61 | .69 | .66 |

For item validity, item-factor and item-total correlations were investigated. Zero-order correlations between each item and total epistemic curiosity score were high (ran-

ging between .51 and .71, $p < .01$). These values indicated that those who score high on an item also score high on the full scale. Additionally, the correlation between the I-Type epistemic curiosity factor scores and the items on this factor was high and statistically significant (varied between .62 and .72, $p < .01$). Similarly, the correlation between the D-Type epistemic curiosity factor score and the items on this factor was high and statistically significant (varied between .69 and .74, $p < .01$). These results showed that children who scored high on each item also scored high on the factor to which that item belongs. Table 1 shows the item-factor and item-total score correlations.

To investigate the reliability of the I-Type/D-Type Epistemic Curiosity Scale, internal consistency coefficients were investigated. Table 2 shows internal consistency coefficients I-Type, D-Type, and the total epistemic curiosity. Cronbach's Alpha coefficients (I-Type = .72, D-Type = .76, and the epistemic curiosity = .83) were acceptable. Additionally, Table 2 shows means, standard deviations, and zero-order correlations for the study variables.

To test the second hypothesis that both I-Type and D-Type epistemic curiosity would correlate positively with self-regulation (*H2*), zero-order correlations were calculated. Zero-order correlations indicated a positive and significant relationship between self-regulation and both I-type ($r = .41$) and D-type ($r = .53$) epistemic curiosity.

**Table 2**
*Means, Standard Deviations, and Zero-Order Correlations between I-Type, D-Type Epistemic Curiosity, and Total Epistemic Curiosity*

| | M | SD | Min | Max | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| 1. I-type curiosity | 17.68 | 1.99 | 10 | 20 | (.72) | .59* | .85* | .41* |
| 2. D-type curiosity | 14.88 | 2.69 | 7 | 20 | | (.76) | .93* | .53* |
| 3. Total Epistemic Curiosity | 33.03 | 4.15 | 19 | 40 | | | (.83) | .54* |
| 4. Self regulation | 81.04 | 9.01 | 41 | 100 | | | | (.87) |

*Not.* $N = 636$, $*p < .01$. The values given in parentheses in the table represent Cronbach's alpha coefficients of the relevant scales.

To test the third hypothesis that the correlation between D-Type epistemic curiosity and self-regulation would be more pronounced than the correlation between I-Type epistemic curiosity (*H3*), partial correlations were calculated. Zero-order correlations reflect the relationship between curiosity types and self-regulation. However, partial correlations reflect the relation between one type of epistemic curiosity and self-regulation when the variance accounted for by the other curiosity type partialled out of the correlation. This unique correlation between curiosity type and self-regulation shows

the divergence of two I-Type and D-Type epistemic curiosity. Both I-Type epistemic curiosity ($r$ = .48) and D-Type epistemic curiosity ($r$ = .53) correlated moderately positively to self-regulation. However, when the variance accounted for by the other curiosity construct partialled out, the correlation between I-Type epistemic curiosity and self-regulation (although still significant) became weak ($r$ = .14), whereas the correlation between D-Type and self-regulation was still moderate ($r$ = .39). This shows that D-Type was more strongly related to self-regulation.

## Discussion

This study aimed to examine the reliability and validity of the Turkish version of the I-Type/D-Type Epistemic Curiosity Scale for Young Children. After translation and linguistic adaptation, data were obtained for 48–83 month-old children, and the scale's psychometric properties were investigated. Confirmatory Factor Analysis confirmed the two-factor structure of the 10-item Turkish version. This finding is consistent with the original scale study (Piotrowski et al., 2014) that also distinguishes between I/Type and D/Type of epistemic curiosity. All factor loadings for ten items were acceptable and significant. Zero-order correlations between each item and total epistemic curiosity score were high, supporting the fact that those who score high on an item also score high on the full scale. Additionally, correlations between the total scores of the I-Type epistemic curiosity and the D-Type epistemic curiosity were statistically significant. In other words, children who scored high on each item also scored high on the factor to which that item belongs.

Additionally, the calculated Cronbach's Alpha coefficients for the factors and the overall scale revealed that the internal consistency was satisfactory. Further, for the construct validity of the scale, zero-order correlations reported a significant positive relationship between self-regulation and both I-Type and D-Type epistemic curiosity, as hypothesized (Piotrowski et al., 2014). Conversely, partial correlations reflected the relationship between one type of epistemic curiosity and self-regulation when the variance was accounted for by the other curiosity type partially out of the correlation. These findings revealed the unique correlation between curiosity type and self-regulation, highlighting the divergence of two I-Type and D-Type epistemic curiosity. This result contributes to the international debate on understanding the dimensions and correlates of curiosity (e.g., Huang et al., 2010; Litman & Mussel, 2013; Karandikar et al., 2021)

and confirms Litman's theory of two-dimensional curiosity for the Turkish context (2008, 2019).

Furthermore, the relationship between self-regulation and D-Type epistemic curiosity remained moderate even when controlling for I-Type epistemic curiosity. In contrast, the relationship between self-regulation and I-Type epistemic curiosity decreased from moderate to weak. This finding backs up the findings of several studies by Litman and colleagues (i.e., Litman et al., 2005; Litman, 2008; Litman et al., 2010; Litman & Mussel, 2013) and also, the hypothesis of this study by showing that D-Type encourages goal-oriented effort and persistence (Litman, 2008; Piotrowski et al., 2014) and requires a high level of focus, perseverance, and cognitive work to learn new material and thus, is related more to persistence which is an expression of higher self-regulation as shown by Lunkenheimer and colleagues (2019).

In brief, the findings of this study provided evidence that the 10-item Turkish version of the I-Type and D-Type Epistemic Curiosity Scale for Young Children can be used to assess young children's curiosity through mothers' ratings. The obtained results are hoped to inspire and motivate further research related to developing and adapting other instruments focusing on early childhood.

**Ethics Committee** Approval: Approval was obtained from Bahçeşehir University Scientific Research and Publication Ethics Committee. (E-20021704-604.01.02-16779).
**Peer-review:** Externally peer-reviewed.
**Author Contributions:** Conception/Design of Study- S.S., E.M. T.A.; Data Acquisition- S.S., E.M. T.A.; Data Analysis/Interpretation- S.S., E.M. T.A.; Drafting Manuscript- S.S., E.M. T.A.; Critical Revision of Manuscript- S.S., E.M. T.A.; Final Approval and Accountability- S.S., E.M. T.A.
**Conflict of Interest:** The authors have no conflict of interest to declare.
**Grant Support:** The authors declare that this study has received no financial support.

**Etik Komite: XXXX**
**Hakem Değerlendirmesi:** Dış bağımsız.
**Yazar Katkıları:** XXXXXX.
**Çıkar Çatışması:** Yazarlar çıkar çatışması bildirmemiştir.
**Finansal Destek:** Yazarlar bu çalışma için finansal destek almadığını beyan etmiştir.

## References/Kaynakça

Bacanlı, H., & Türk Kurtça, T. (2020). Eğitim psikolojisi açısından merak: Genel bir değerlendirme. *HAYEF: Journal of Education, 17*(1), 103-120. DOI: 10.5152/hayef.2020.1923.

Behr, D. (2017). Assessing the use of back translation: The shortcomings of back translation as a quality testing method. *International Journal of Social Research Methodology*, *20*(6), 573–584.

DOI: 10.1080/13645579.2016.1252188
Berlyne, D. E. (1954). A theory of human curiosity. *British Journal of Psychology*, 45, 180–191.
Berlyne, D. E. (1978). Curiosity and learning. *Motivation and Emotion*, 2, 97–175.
Bijvoet-van den Berg, S., & Hoicka, E. (2014). Individual differences and age-related changes in divergent thinking in toddlers and pre-schoolers. *Developmental Psychology*, *50*(6), 1629–1639. https://doi.org/10.1037/a0036131
Bouchacourt, F., & Buschman, T. J. (2019). A flexible model of working memory. *Neuron*, *103*(1), 147-160. https://doi.org/10.1016/j.neuron.2019.04.020
Bronson, M. B., Goodson, B. D., Layzer, J. J., & Love, J. (1990). *Child Behavior Rating Scale*. Abt. Associates.
Ceylan, E., Sağırekmekçi, H., Tatar, E., & Bilgin, İ. (2016). Investigation of middle school students' science course achievement according to their curiosity, attitude, and motivation levels. *Uşak University Journal of Social Sciences*, *9*(1), 39-52. DOI: 10.12780/uusbd.50837
Demirel, M., & Coşkun, Y. D. (2009). Üniversite öğrencilerinin meraklılık düzeylerinin bazı değişkenler açısından incelenmesi. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, *18*, 111-134.
Douglas, S. P., & Craig, C. S. (2007). Collaborative and iterative translation: An alternative approach to back translation. *Journal of International Marketing*, *15*(1), 30–43. https://doi.org/10.1509/jimk.15.1.030
Epstein, J., Osborne, R. H., Elsworth, G. R., Beaton, D. E., & Guillemin, F. (2015). Cross-cultural adaptation of the health education impact questionnaire: An experimental study showed expert committee, not back-translation, added value. *Journal of Clinical Epidemiology*, *68*(4), 360–369. https://doi.org/10.1016/j.jclinepi.2013.07.013
Eren, A., & Coskun, H. (2016). Students' level of boredom, boredom coping strategies, epistemic curiosity, and graded performance. *The Journal of Educational Research*, *109*(6), 574-588. DOI:10.1080/00220671.2014.999364
Erol, A., & İvrendi, A. (2018). 4-6 Yaş Çocuklarına Yönelik Öz-Düzenleme Becerileri Ölçeğinin Geliştirilmesi (anne formu). *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi*, *44*(44), 178-195. doi: 10.9779/PUJE.2018.213
Glogger-Frey, I., Fleischer, C., Grüny, L., Kappich, J., & Renkl, A. (2015). Inventing a solution and studying a worked solution prepare differently for learning from direct instruction. *Learning and Instruction*, *39,* 72–87.https://doi.org/10.1016/j.learninstruc.2015.05.001
Grossnickle, E. M. (2016). Disentangling curiosity: Dimensionality, definitions, and distinctions from an interest in educational contexts. *Educational Psychology Review*, *28*(1), 23-60. https://doi.org/10.1007/s10648-014-9294-y
Hardy, J. H., Ness, A. M., & Mecca, J. (2017). Outside the box: Epistemic Curiosity as a predictor of creative problem solving and creative performance. *Personality and Individual Differences, 104,* 230–237. https://doi.org/10.1016/j.paid.2016.08.004
Hassinger-Das, B., & Hirsh-Pasek, K. (2018). Appetite for knowledge: curiosity and children's academic achievement. *Pediatric Research*, *84*(3), 323-324. DOI:10.1038/s41390-018-0099-4
Hong, J. C., Hwang, M. Y., Liu, Y. H., & Tai, K. H. (2022). Effects of gamifying questions on English grammar learning mediated by epistemic curiosity and language anxiety. *Computer Assisted Language Learning*, *35*(7), 1458-1482. http://dx.doi.org/10.1080/09588221.2020.1803361
Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Huang, D., Wang, L., Zhou, M., & Zhang, J. (2010, August). Gender difference in motives of knowledge searching: Measurement invariance and factor mean comparison of the interest/deprivation epistemic curiosity. In *2010 IEEE 2nd Symposium on Web Society* (pp. 258–263). IEEE.

Ishaq, E., Bashir, S., Khan, A. K., Hassan, M. M., & Zakariya, R. (2021). Epistemic curiosity and perceived workload: A moderated mediation model of achievement striving and overwork climate. *The International Journal of Human Resource Management*, *32*(18), 3888-3911. https://doi.org/10.1080/09585192.2019.1657662

Jirout, J. J., Vitiello, V. E., & Zumbrunn, S. K. (2018). Curiosity in schools. In G. Gordon (Ed.), *The new science of curiosity* (pp. 243–266). Nova.

Kaczmarek, L. D., Kashdan, T. B., Kleiman, E. M., Baczkowski, B., Enko, J., Siebers, A., Szäefer, A., Król, M., & Baran, B. (2013). Who self-initiates gratitude interventions in daily life? An examination of intentions, curiosity, depressive symptoms, and life satisfaction. *Personality and Individual Differences*, *55*, 805–810. http://dx.doi.org/10.1016/j.paid.2013.06.013

Karandikar, S., Kapoor, H., & Litman, J. (2021). Why so curious? Validation and cross-cultural investigation of the Hindi Epistemic Curiosity Scale. *Asian Journal of Social Psychology*, *24*(1), 69-82. https://doi.org/10.1111/ajsp.12425

Kashdan, T. B., Stiksma, M. C., Disabato, D. J., McKinght, P. E., Bekier, J., Kaji, J., & Lazarus, R. (2018). The Five-Dimensional Curiosity Scale: Capturing the bandwidth of curiosity and ıdentifying four unique ungroups of curious people. *Journal of Research in Personality, 73*, 130–149. https://doi.org/10.1016/j.jrp.2017.11.011

Kline, T. J. B. (2005). *Psychological testing. A practical approach to design and evaluation.* Sage.

Lauriola, M., Litman, J. A., Mussel, P., De Santis, R., Crowson, H. M., & Hoffman, R. R. (2015). Epistemic curiosity and self-regulation. *Personality and Individual Differences*, *83*, 202–207. http://dx.doi.org/10.1016/j.paid.2015.04.017

Lindholm, M. (2018). Promoting curiosity. *Science & Education*, *27*(9-10), 987–1002. https://doi.org/10.1007/s11191-018-0015-7

Litman, J. (2019). Curiosity: Nature, dimensionality, and determinants. In K. A. Renninger & S. E. Hidi (Eds.), *The Cambridge handbook of motivation and learning* (pp. 418–442). Cambridge University Press.

Litman, J. A. (2005). Curiosity and the pleasures of learning: Wanting and liking new information. *Cognition and Emotion*, *19*, 793–814. https://doi.org/10.1080/02699930541000101

Litman, J. A. (2008). Interest and deprivation dimensions of epistemic curiosity. *Personality and Individual Differences, p. 44*, 1585–1595. doi:10.1016/j.paid.2008.01.014

Litman, J. A., & Jimerson, T. L. (2004). The measurement of curiosity is a feeling of deprivation. *Journal of Personality Assessment*, *82*, 147–157. https://doi.org/10.1207/s15327752jpa8202_3

Litman, J. A., & Mussel, P. (2013). Validity of the interest-and deprivation type epistemic curiosity model in Germany. *Journal of Individual Differences*, *34*, 59–68. https://doi.org/10.1027/1614-0001/a000100

Litman, J. A., & Spielberger, C. D. (2003). Measuring epistemic curiosity and its diversive and specific components. *Journal of Personality Assessment*, *80*(1), 75–86. https://doi.org/10.1207/S15327752JPA8001_16

Litman, J. A., Crowson, H. M., & Kolinski, K. (2010). Validity of the interest- and- deprivation- type epistemic curiosity distinction in non-students. *Personality and Individual Differences, 49*(5), 531–536. DOI:10.1016/j.paid.2010.05.021

Litman, J. A., Hutchins, T., & Russon, R. (2005). Epistemic curiosity, feeling-of-knowing, and

exploratory behavior. *Cognition and Emotion, 19*(4), 559–582. DOI: 10.1080/02699930441000427

Lunkenheimer, E., Panlilio, C., Lobo, F. M., Olson, S. L., & Hamby, C. M. (2019). Preschoolers' self-regulation in context: Task persistence profiles with mothers and fathers and later attention problems in kindergarten. *Journal of Abnormal Child Psychology*, *47*(6), 947-960. https://doi.org/10.1007/s10802-019-00512-x

Lydon-Staley, D. M., Zurn, P., & Bassett, D. S. (2020). Within-person variability in curiosity during daily life and associations with well-being. *Journal of Personality*, *88*(4), 625–641. https://doi.org/10.1111/jopy.12515

McClelland, M. M., & Cameron, C. E. (2012). Self-regulation in early childhood: Improving conceptual clarity and developing ecologically valid measures. *Child Development Perspectives*, *6*(2), 136–142. https://doi.org/10.1111/j.1750-8606.2011.00191.x

Munakata, Y., Herd, S. A., Chatham, C. H., Depue, B. E., Banich, M. T., & O'Reilly, R. C. (2011). A unified framework for inhibitory control. *Trends in Cognitive Sciences*, *15*(10), 453–459. doi: 10.1016/j.tics.2011.07.011

Mussel, P. (2010). Epistemic curiosity and related constructs: Lacking evidence of discriminant validity. *Personality and Individual Differences*, *49*(5), 506-510. https://doi.org/10.1016/j.paid.2010.05.014

Perry, N. B., Dollar, J. M., Calkins, S. D., Keane, S. P., & Shanahan, L. (2018). Childhood self-regulation is a mechanism through which early overcontrolling parenting is associated with adjustment in preadolescence. *Developmental Psychology*, *54*(8), 1542. DOI: 10.1037/dev0000536

Peters, R. A. (1978). Effects of anxiety, curiosity, and perceived instructor threat on student verbal behavior in the college classroom. *Journal of Educational Psychology, 70*(3), 388–395. https://doi.org/10.1037/0022-0663.70.3.388

Peterson, C., Ruch, W., Beermann, U., Park, N., & Seligman, M. E. (2007). Strengths of character, orientations to happiness, and life satisfaction. *Journal of Positive Psychology*, *2*, 149–156. https://doi.org/10.1080/17439760701228938

Piotrowski, J. T., Litman, J. A., & Valkenburg, P. (2014). Measuring epistemic curiosity in young children. *Infant and Child Development*, *23*(5), 542-553. https://doi.org/10.1002/icd.1847

Richards, J. B., Litman, J., & Roberts, D. H. (2013). Performance characteristics of measurement instruments of epistemic curiosity in third-year medical students. *Medical Science Educator*, *23*(3), 355–363. https://doi.org/10.1007/BF03341647

Sezgin, E., & Demiriz, S. (2016). Çocuk Davranış Değerlendirme Ölçeği'nin (ÇODDÖ) Türkçe'ye uyarlanması: Geçerlik ve güvenirlik çalışması. *Mersin Üniversitesi Eğitim Fakültesi Dergisi, 12*(2), 702-718. https://doi.org/10.17860/efd.15303

Shah, P. E., Weeks, H. M., Richards, B., & Kaciroti, N. (2018). Early childhood curiosity and kindergarten reading and math academic achievement. *Pediatric Research*, *84*(3), 380–386. DOI: 10.1038/s41390-018-0039-3

Silvia, P. J. (2012). Curiosity and motivation. In R. M. Ryan (Ed.), *The oxford handbook of human motivation* (pp. 157–167). Oxford University Press

Sternberg, R. J. (1994). Answering questions and questioning answers: Guiding children to intellectual excellence. *The Phi Delta Kappan*, *76*(2), 136-138.

Sümer, N. (2000). Yapısal eşitlik modelleri: Temel kavramlar ve örnek uygulamalar. *Türk Psikoloji Yazıları. 3*(6), 49-74.

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics*, 5, 481-498. Pearson.

Tang, X., & Salmela-Aro, K. (2021). The prospective role of epistemic curiosity in national standardized test performance. *Learning and Individual Differences*, *88*, 102008.

Totsune, T., Matsudaira, I., & Taki, Y. (2021). Curiosity–tourism interaction promotes subjective well-being among older adults in Japan. *Humanities and Social Sciences Communications*, *8*(1), 1-11. https://doi.org/10.1057/s41599-021-00748-3

Van Schijndel, T. J., Jansen, B. R. & Raijmakers, M. E. (2018). Do individual differences in children's curiosity relate to their inquiry-based learning? *International Journal of Science Education*, *40*(9), 996-1015. https://doi.org/10.1080/09500693.2018.1460772

Vardi, Ö., & Demiriz, S. (2019). Okul öncesi öğretmenlerinin çocukların meraklarına yönelik görüşleri. *E-Kafkas Eğitim Araştırmaları Dergisi, 6*(4), 44-58. https://doi.org/10.30900/kafkasegt.655872

Wass, S. V., Scerif, G., & Johnson, M. H. (2012). Training attentional control and working memory–Is younger better? *Developmental Review*, *32*(4), 360–387. https://doi.org/10.1016/j.dr.2012.07.001

Yang, S., Carlson, J. R., & Chen, S. (2020). How augmented reality affects advertising effectiveness: The mediating effects of curiosity and attention toward the ad. *Journal of Retailing and Consumer Services*, 54, 102020. DOI:10.1016/j.jretconser.2019.102020

Yazıcı, T., & Kartal, O. Y. (2020). Epistemik merakın eğitimdeki rolü. *Ahi Evran Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 6*(2), 570-589.