Uluslararası Anadolu Sosyal Bilimler Dergisi
Cilt: 7
Sayı: 3
Yıl: 2023

ZİHİN KURAMI GÖREV BATARYASININ (TOMTB) 3-5 YAŞ ÇOCUKLARI İÇİN GEÇERLİK VE GÜVENİRLİK ÇALIŞMASI*

Canan KELEŞ ERTÜRK**
Kezban TEPELİ***

ÖZET

Bu araştırma 3-5 yaş çocukları için Zihin Kuramı Görev Bataryasının (TOMTB) geçerlik ve güvenirlik çalışması amacıyla yapılmıştır. Araştırma nicel araştırmalardan genel tarama modelinde tasarlanmıştır. Araştırmanın çalışma grubunu 2019-2020 eğitim öğretim yılında Konya İl Merkezinde Milli Eğitim Bakanlığına bağlı anaokullarına devam eden 3-5 yaş grubunda 310 çocuk olışturmaktadır. Araştırma verilerinin toplanması amacıyla Zihin Kuramı Görev Bataryası (TOMTB) ve Genel Bilgi Formu kullanılmıştır. Zihin Kuramı Görev Bataryası (TOMTB)'nın geçerlik çalışmaları için kapsam geçerliği (uzman görüşü) ve yapı geçerliği (doğrulayıcı faktör analizi) incelenmiştir. Ölçümlerin iç tutarlılık anlamındaki güvenirliği, KR-20, test tekrar test güvenirliği ve Pearson Korelasyon Katsayısı ile hesaplanmıştır.Yapılan analizlerde Zihin Kuramı Görev Bataryası (TOMTB)'nın 3-5 yaş çocukları için geçerli ve güvenilir bir test olduğu saptanmıştır.

Anahtar Kelimeler: Okul Öncesi, Zihin Kuramı, Zihin Kuramı Görev Bataryası,Yanlış İnanç Görevi.

VALIDITY AND RELIABILITY OF THEORY OF MIND TASK BATTERY (TOMTB) FOR 3-5 YEAR OLD CHILDREN

ABSTRACT

This study was conducted for the validity and reliability study of the Theory of Mind Task Battery (TOMTB) for 3-5 year old children. The study was designed in the general survey model, one of the quantitative research. The study group consists of 310 children in the 3-5 age group attending kindergartens affiliated to the Ministry of National Education in Konya City Centre in the 2019-2020 academic year. Theory of Mind Task Battery (TOMTB) and General Information Form were used to collect the research data. Content validity (expert opinion) and construct validity (confirmatory factor analysis) were examined for the validity studies of the Theory of Mind Task Battery (TOMTB). The reliability of the measurements in terms of internal consistency was calculated with KR-20, test-retest reliability and Pearson Correlation Coefficient. The analyses showed that the Theory of Mind Task Battery (TOMTB) is a valid and reliable test for 3-5 year old children.

Keywords: Preschool, Theory of Mind, Theory of Mind Task Battery, False Belief Task.

1. INTRODUCTION

Since the early 1980s, theory of mind, defined as the ability to predict and explain people's behaviour by referring to mental states, has been regarded as an important milestone in social cognitive development. Theory of mind, also called as mentalising, mind-reading or desire-belief psychology, traditionally views the social world as the basis for adult understanding (Slaughter & Repacholi: 2003). Theory of mind refers to the capacity to interpret, predict and explain the behaviour of others according to their underlying mental states. Theory of mind is an ability that all typically developing individuals have and manifests itself in early childhood (Scholl & Leslie: 1999).

The ability to calculate the mental states of others (beliefs, desires, knowledge, goals, etc.) varies from person to person. Predicting the behavior of others using not only physical and visual stimuli but also inferences

* This study was prepared by making use of the doctoral thesis titled " The Effect Of Social Information Processing, Self-Regulation And Metacognition Variables On Theory Of Mind: Structural Equality Modeling" conducted by the first author under the supervision of the second author.

** Corresponding author, Dr. Öğrt. Üyesi; KTO Karatay University Vocational School Of Health Services, Child Development Program, Konya, Türkiye, canan.erturk@karatay.edu.tr, ORCID: 0000-0001-6247-0073.

*** Prof.Dr.; Selcuk University, Faculty of Health Sciences, Child Development, Konya, Turkey, ktepeli@selcuk.edu.tr, ORCID: 0000-0003-3403-3890.

Research Article Pp:627-639
Arrival Date: 04.07.2023 Acceptance Date: 24.08. 2023 Puplication Date: 30.09.2023

from such mental states is a skill that evolves over time (Welsh: 2021). Children start to understand the social world differently when they begin to consider other people's perspectives, thoughts and feelings. Children's understanding of communication between others changes as they begin to take into account a speaker's communicative intent and learn to look behind the superficial meaning of a statement of what the speaker intends to convey. Finally, children begin to use their skills to achieve social goals such as gaining the acceptance of their peers. Each of these developments depends, at least in part, on the improvements in the child's theory of mind and the child's ability to use this knowledge in daily mind reading (Keenan: 2003).

The false belief task is commonly used to determine theory of mind. It is a task in which accurate predictions about another person's behaviour can be obtained by reference to that person's mental (mis)representation (i.e. their false belief). This task is often referred to as the "important test" for assessing children's mental understanding. The false belief task is considered valuable because it is well standardised,psychometrically reliable, quick and easy to administer, and interesting for children (Slaughter & Repacholi: 2003).

Theory of mind has been a dynamic area of research in developmental psychology for the last 20 years, but surprisingly, the issue of its relationship with social development has only recently come to the fore and been recognised as an important topic (Astington: 2003). The interpretation of behaviour occurs by linking purposefully performed states (i.e. mental states) to other people. Mental states such as perception, attention, belief, desire, intention, emotion, etc. have an important role in the theory. The core of the theory of mind is the assumption that people's actions are motivated by their desires in the light of their beliefs. However, in addition to this assumption, it is accepted that desires also affect beliefs such as attention, perception and emotion. Desires are also affected by emotions and beliefs, and beliefs and desires affect intention. In other words, the theory of mind has to take into account the network of interconnected mental states. Understanding this network is seen as fundamental to social functioning. In the absence of this network, actions cannot be interpreted, cause and effect relationships cannot be made sense of, and situations such as being deprived of understanding the true meaning of what is said may arise. Therefore, theory of mind is accepted as the basis for social functioning (Astington: 2003).

Theory of mind refers to the ability to predict and explain behaviour with reference to internal, mental states. More specifically, it includes different mental states such as emotions, perceptions, intentions, desires,beliefs and relationships [Baron-Cohen:1994 and Lee, Eskritt, Symons, & Muir: 1998 as cited by Repacholi et al.: 2003]. The basic idea in desire-belief psychology is that people's actions stem from beliefs and desires, and more specifically, that people take actions that they believe will fulfil their desires. This system takes people's beliefs as the centre for understanding actions and accepts that people do not take actions that will fulfil their desires, they take actions that they believe they will achieve. Because of this central role of belief in everyday psychology, children's understanding of belief has been the subject of primary investigation in research on theory of mind (Bartsch & Wellman, 1995: 149).

There is a consensus on key milestones in the development of theory of mind, but there are also different perspectives on the essential character of its achievement and how it has been achieved. According to some experts, theory of mind and its development are the product of learning processes. A prominent alternative is that mental states are the product of an advanced theory of mind module. Such a module is active at the beginning of life and and performance factors such as increased language capacity, cognitive complexity or increased capacity for control take into account the changes that occur in the child. However, experts agree that some forms of developmental differences exist, and that developmental data are effective in revealing the nature and acquisition of theory of mind (Wellman: 2011).

Theory of mind is a framework in which certain perceptual inputs are interpreted or conceptualized as a means, an intentional action, or belief. This input also frames and directs further operations performed on it.

People with underdeveloped theory of mind, on the other hand, can receive all the available information, but they lack the conceptual network that will help them to interpret its meaning easily and quickly (Malle: 2005). The development of comprehension skills begins with birth. Only a few- day-old babies prefer to look at people and faces, imitate people, listen to human voices rather than inanimate devices. Babies'' initial views on intentions result in their understanding that purposeful factors act according to their desires and emotions restricted by their perceptual experience. This understanding of desire, emotion and perception includes the awareness of the primitive but impressive representatives of the events or their unawareness of the events. If the individuals do not update their experience of the situation as the event changes, then they are not aware of the underlying conditions.Being ignorant about something is not the same as having a false belief about it. Therefore, beliefs focus more clearly on the person's mental content. The mental content such as ideas, thoughts and images is the distinguishing feature of the representational theory of mind. False belief task reveals the theory of mind success of the child, which has a universal value. Although the false belief task has different forms, it is generally used in relation to changes in positions. For example, a candy is placed in one of two different locations. The location of the candy is changed when the character does not see it, and the child is asked where the character will look for the candy. Another frequently used task as an alternative is the task of using deceptive content. In this task, for example, children see a crayon box and think it contains crayons. However, after opening the box, they see that there are candies inside. The children are asked what an outsider who does not see the inside of the box thinks is in the box (Wellman: 2011).

The false belief task is frequently used in assessing the ability related to theory of mind. The practical importance of representing another person's false beliefs lies in using that representation as a frame of reference for interpreting or predicting the other person's actions. That is, interpretations and expectations should be limited to the other person's area of belief. In the sample false belief practice, each child was told two stories with two different versions. The first version involved co-operation and the second version involved competition with an opponent (Wimmer & Perner: 1983). This false belief task can be used to empirically determine the age at which children begin to have adult-like theory of mind skills. A different perspective on theory of mind is whether some individuals, children or adults, may have deficiencies in terms of theory of mind (Zufferey, 2010: 8). This perspective is a hypothesis made by Baron Cohen et al. (1985). Baron Cohen et al. (1985) designed a simplified version of the false belief task to study with typically developing children, individuals with down syndrome and autism spectrum disorder. The so-called Sally-Anne task has become the most popular version of the false belief task. The story, played by two puppets named Sally and Anne, is as follows: Sally has a basket and Anne has a box. Sally has a marble in her hand and puts it in her basket. She then goes outside. Anne takes out Sally's marble and puts it in her box while Sally is away. Then Sally comes back and wants to play with her marble. The practitioner asks, “Where will Sally look for her marble?”. If children point to the previous location of the marble, they understand the puppet's false belief and pass the Belief Question. However, if they point to the current location of the marble, they fail the question, ignoring the puppet's belief. These results are confirmed if the two control questions are answered correctly: "Where is the marble really?" (Reality Question); “Where was the marble in the beginning?” (Memory Question). Control questions are considered very important to ensure that the child both has knowledge of the actual current location of the object and has an accurate memory of the previous location. The result of this study is that children with autism spectrum disorder fail to use a theory of mind as a group. This failure is explained as the inability to represent mental states.

Theory of mind is rapidly acquired by individuals with typical development. It covers a few basic understandings and requires significant learning and development based on a set of specialized abilities in infancy. However, it is severely delayed in children with both autism spectrum disorder and hearing impaired children of hearing parents (Wellman, 2014: 31). Typically, there is a clear developmental sequence in the typically developing child's acquisition of the theory of mind between the ages of 2.5 and 5. Therefore, tasks

related to theory of mind are targeted at children of this age. The capacity of preschool children to correctly understand mental states in these tasks is the basis for determining individual differences in mind reading (Slaughter & Repacholi: 2003).

Having a theory of mind means being aware that the individual has knowledge and beliefs shaped by his/her own experiences, and that other people's experiences shape their knowledge and beliefs. This awareness of cognition and separation of cognition from perception typically occurs around the age of 3 (Kuhn: 2000).

Theory of mind is also called belief-desire psychology because of the value given to the concepts of belief and desire in the predictions and explanations of the individual's daily actions (Karmiloff-Smith: 2010). During the child's development, the ability to reason about desires develops approximately one and a half years before the ability to reason about belief. Even 18-month-old babies have a limited ability to reason about people's desires in a non-egocentric way. When they reach the age of 2.5, they realize that people are happy when they get something they want. In other words, by the age of 2.5, children are able to grasp the causal relationship between desires and emotional outcomes. Language analyses have also provided evidence that 3-year-olds understand beliefs, talk about them frequently, and even understand false beliefs (Bartsch & Wellman: 1995). However, the full realization of the false belief understanding occurs approximately at the age of 4. Children aged 3 and younger fail to understand that a person's mental representation of reality can differ from reality. Other conceptual distinctions that require an understanding of representational diversity are the appearance-reality distinction and the ability to understand that the same entity can be perceived differently from two different visual perspectives. These distinctions are also learned at around the age of 4 in close relation with the understanding of belief. From the age of 4 onwards, children begin to systematically resort to beliefs in their daily actions (Flavell & Miller: 1998 as cited in Sodian & Kristen: 2010).

Theory of mind is also a social concept. It is a belief structure that is held, operated and transmitted by adults in the child's world. Children start to pretend at about one and a half years of age and are therefore capable of reaching a theory of mind from then on. It is generally accepted that at the age of 3 to 6, children develop their first theory of mind as they develop an understanding of mental states as representations and can see the action caused by mental representational states such as beliefs. It is belief-desire psychology that put forward the first true theory of mind, and this belief-desire psychology starts approximately at the age of 3. The fact that 3-year-olds have and use a theory of mind is an impressive and important achievement. Three-year-olds initially have a belief-desire theory of mind, but this initial theory changes significantly towards an active, interpretive theory between the ages of three and six. The belief-desire system has four stages. First, children should be able to predict actions from information given about an individual's beliefs and desires. Second, children should be able to make predictions based only on their beliefs and desires, and explain observed movements by referring spontaneously to their own beliefs and desires. Third, children should also be able to accept the emotional responses of one of the information about beliefs, desires, and consequences. Finally, they should be able to deduce beliefs from information about individuals' perceptions and they should be able to deduce desires from information about individuals' physiological states. Providing data and discussing these four points is the simplest way to document and detail the early belief-desire psychology of young children. This process is summarized in Figure 1. Centrally, people take actions that they believe will get what they want. However, basic emotions and physiological states feed one's desires; perceptual and evidential experiences ground one's beliefs and knowledge, and actions do not only take place, but they also lead to results to which the individual reacts (Wellman, 1990: 100).

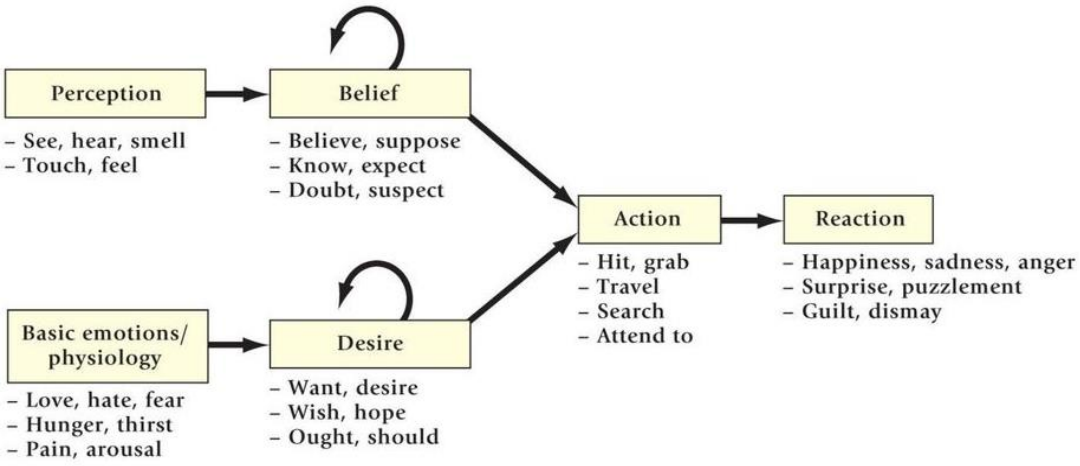

Figure 1.Simplified Scheme Showing Belief-Desire Reasoning
Source: Wellman, 1990: 100.

The development rate of Theory of Mind abilities varies from person to person. Even though the age of success on the classical version of the false belief task is usually set at four years, some typically developing children succeed at the age of three, while others may fail by the age of five. Therefore, it is important to investigate the reasons for these individual differences to find out whether they are caused by genetic factors or the environment of the child (Zufferey, 2010: 38). In a study conducted with identical and fraternal twins, Hughes et al. (2005) indicated that the main factors affecting the development of Theory of Mind are environmental, not genetic. Ruffman et al. (1998) pointed out the important role of the presence of older siblings in facilitating the understanding of belief. They also emphasized both the importance of social interactions to facilitate the understanding of belief and the importance of understanding beliefs to facilitate social interactions.

Babies are able to distinguish the movements of animate and inanimate objects at about the sixth month, and their joint attention ability begins to develop at the age of twelve months. It is accepted that the theory of mind manifests itself for the first time developmentally in the joint attention ability at the age of about eighteen months. At the age of three, children cannot distinguish the beliefs of others from their own beliefs and understand them, but by the age of 4, they develop the ability to understand the beliefs of others (Şahin et al: 2019).

Theory of mind develops gradually with intuitive social skills that emerge in infancy and reflective social cognition that develops in childhood when walking begins and in preschool years. At the age of 3, they know that different people may want, love and feel different things, while at the age of 4-5, they know that people may think of different things. They realize that sometimes a person may believe something that is not true, but in this case they understand that what the person does or says is based on false belief. Theory of mind refers to understanding people as mental beings, each with their own mental states (such as thoughts, desires, motives, and emotions). People use theory of mind to explain their own behaviour by telling their thoughts and feelings to others and interpret other people's speech and behaviour by taking their thoughts and wishes into account (Astington & Edward: 2010).

Theory of mind and language are complex and multifaceted systems that develop tremendously, especially in the second to fifth years of life. As these systems mature, the relationship between them also changes, and a developmental change in one encourages further progress in the other. It is essential to consider representation and communication for both language and theory of mind. Language allows people to convey representations of reality, namely their point of view. Theory of mind involves an understanding of representation and communication, that is, the realisation that people have different perspectives underlying all their communicative interactions and can communicate directly with others. Theory of mind requires awareness of mental states and the ability to use one's awareness of this network of mental states to explain, predict and interpret the behavior of others, the ability to interpret one's own and others' behavior, not only physical actions

but also speech-related actions. In short, theory of mind forms the basis of the ability to interpret human action and communication (Astington: 2020).

Using theory of mind requires the ability to recognise ambiguous situations in oneself and others. One of the most important developments of the second year of human life is the emergence of the ability to pretend/act. Pretend/fake games are an early manifestation of theory of mind. Pretending/fake games are among the earliest manifestations of one's ability to characterize and manipulate one's own and others' cognitive relationships with knowledge. This ability, which is central to theory of mind, will eventually involve characterising relationships such as believing, expecting and hoping, and manipulating these relationships in others (e.g. someone promising and expecting something to happen). Intentional communication emerges in gesture and vocalization at the beginning of the second year, and these abilities may also have some implications for theory of mind (Leslie: 1987).

Cultural-social-speech experiences shape children's developing theory of mind, resulting in notable differences in the order and timelines for children to reach these conceptual understandings. The difficult task, however, is to properly understand how differences illuminate the universal situation and how communities frame differences. Examining the developmental sequences in the success of theory of mind provides a perspective. This highlights both cultural speech influences on the development of theory of mind and universal social cognitive achievements in childhood. In short, theory of mind constitutes a basic human cognition which helps define basic cognitive perspectives common to all humans (Wellman, 2014: 107).

In preschool years, children's social lives and emotional well-being are primarily affected by interactions with parents and siblings, which is significantly related to individual differences in theory of mind (Slaughter et al.: 2015).

Individual diversity in the development of theory of mind led to consideration of antecedents such as participation in imaginary games, the presence of siblings, the frequency of participation in explanatory conversations and bilingual growth. Researchers also emphasize that the development of theory of mind has significant effects on children's friendships and popularity, playing skills, persuading and discussing strategies with others and the transition to school (Wellman: 2017).

The mechanism linking early child-mother interaction, later child-friend interaction, especially socially complex play, are children's “Theory of Mind” skills. Children with a secure attachment history are more likely to use their theory of mind skills with their friends for positive purposes (McElwain, et al.: 2019).

To summarize briefly, studies tend to show that the child's environment plays an important role in the development of his/her theory of mind skills. However, this does not mean that the theory of mind does not have a genetic basis. The theory of mind has a genetic basis, but environmental factors play an important role in its development. In other words, innate theory of mind is shaped by the developmental time process and certain factors in the child's environment (Zufferey, 2010: 39).

2. METHOD

2.1.Study Group

The study group consists of a total of 310 children aged 3-5, attending preschools and kindergartens affiliated to the Ministry of National Education in the city center of Konya, and their mothers. The sample size is estimated based on relative criteria such as the number of items or factors. For factor analysis, the sample size is reported to be 100=poor, 200=adequate, 300=good, 500=very good, and 1000 and above=excellent. The sample size recommendation of Bryman and Cramer is to apply as much as the number obtained by multiplying the number of items by 5 or 10 (Cokluk et al: 2018). Therefore, in this study, the sample was determined as 310 people, based on 5 times the number of items.

2.2.Data Collection Tools

In the study, the Validity and Reliability Study of the Theory of Mind Task Battery (TOMTB) was conducted for Turkish children aged 3-5 years. In addition, a general information form was used to obtain information about the demographic characteristics of the participants.

2.2.1. General Information Form

In the study, the "General Information Form" prepared by the researcher was used to determine the demographic characteristics of children aged 3-5 years and their parents. This form consists of multiple-choice questions about the child's gender, date of birth, birth order, number of siblings, duration of preschool attendance, socio-economic level of the family, age of the parents, education level of the parents, occupation of the parents, working status of the parents.

2.2.2.Theory of Mind Task Battery (TOMTB)

Theory of Mind Task Battery was developed by Hutchins, Prelock and Chace in 2008, and was revised by Hutchins and Prelock in 2014. The TOMTB was designed to assess the theory of mind of children with diverse cognitive and language profiles. The final version of the task battery includes 15 main questions and 10 control questions within 9 tasks. These tasks are: Emotion Recognition Task, Desire-Based Emotion Task, Seeing Leads To Knowing Task, Line of Sight Task, Perception-Based Action Task, Standard False Belief Task, Belief- and Reality-Based Emotion and Second-order Emotion Task, Message-Desire Discrepant Task and Second Order False Belief Task. The validity and reliability study of the Theory of Mind Task Battery was conducted with both typical developing children and children diagnosed with autism spectrum disorder. In the analyzes performed, the internal consistency was found to be $\alpha = .91$ in T1 and $\alpha = .94$ in T2. Each page has colorful illustrations and accompanying text. The questions are answered by children either by pointing to a picture showing the correct answers or by answering verbally. Each correct answer gets 1 point and wrong answer gets 0 points. When validation questions are also included in the scoring, scoring is carried out over 1, 2 and 3, and a child gets a maximum of 45 points in this test. Tasks A and B represent Early Theory of Mind skills, task C - F represent Basic Theory of Mind skills and task G - I represent Advanced Theory of Mind Skills (Hutchins & Prelock: 2010).

2.3.Data Collection

In the study, data were collected by face-to-face and individual interviews with children and their mothers using data collection tools.

2.4.Analysis of Data

Content validity (expert opinion) and construct validity (confirmative factor analysis) were examined for validity studies of Theory of Mind Task Battery (TOMTB). For content validity, the test was sent to 5 academicians, 1 with a doctorate degree in guidance and psychological counselling and 4 with a doctorate degree in child development and education, and expert opinion was obtained in terms of the suitability of the items to the relevant age group and developmental area and the appropriateness of the way the items were presented. The reliability of the measurements in terms of internal consistency was calculated by KR-20, test-retest reliability and Pearson Correlation Coefficient.

3. RESULTS

For the expert evaluations of the Theory of Mind Task Battery (TOMTB), whose validity-reliability analyses for 3-5-year-old children were conducted, expert opinions were obtained from 5 academicians, 1 with a doctorate degree in guidance and psychological counselling and 4 with doctorate degrees in child development and education. As a result of the expert evaluations, the content validity rate was calculated for each item of the test.

The validity evidence of the Theory of Mind Task Battery (TOMTB) was analysed by CFA, and reliability was calculated by KR-20, test-retest reliability and Pearson Correlation Coefficient. TOMTB with 15 items was administered to 310 typically developing children. The battery consists of three subscale that are not related to each other. The first subscale consisting of five items could not be included in the analyses because all of the students gave correct answers in 4 items (Table 1).

Table 1. Descriptive Statistics for the Theory of Mind Early Subscale

	Valid Answer	f	%
TOMTB Task A Test 1	1	310	100.0
TOMTB Task A Test 2	1	310	100.0
TOMTB Task A Test 3	1	310	100.0
TOMTB Task A Test 4	1	310	100.0
TOMTB Task B Test 5	0	64	20.6
	1	246	79.4

When Table 1 was analysed, it was seen that the first 4 questions of the Theory of Mind Task Battery were answered correctly by 310 people. In question 5, 64 people gave wrong answers (0), 246 people gave correct answers (1).

There were no reverse coded items in the measurement tools. No missing data and both univariate and multivariate extreme values were found in the scales included in the analysis. For TOMTB construct validity, Confirmatory Factor Analysis was performed with the data obtained from each scale. The limit values in CFA analysis (Schumacker & Lomax: 2004; Hu & Bentler: 1999; Thompson: 2004; Kline:2015) were evaluated according to Table 2.

Table 2. Limit Values in CFA Analysis

Indices	**Limit Values**
$\chi^2/_{sd}$	Excellent ≤ 3≤ Good ≤ 5
RMSEA	Excellent ≤ 0.05 ≤ Good ≤ 0,08
SRMR	Excellent ≤ 0.05 ≤ Good ≤ 0,08
CFI	Excellent ≥ 0.95 ≥ Good ≥ 0,90
NNFI	Excellent ≥ 0.95 ≥ Good ≥ 0,90
GFI	Excellent ≥ 0.95 ≥ Good ≥ 0,90
AGFI	Excellent ≥ 0.95 ≥ Good ≥ 0,90

KR-20 reliability coefficients were analysed for the reliability of the subscales in the TOMTB battery. For test-retest reliability, data were collected from 30 people at 3-week intervals. It was found that the score distributions did not deviate from normal (between -1.5 and +1.5) according to the kurtosis and skewness coefficients, and the relationship between the two measurements was examined with Pearson Correlation Coefficient. Confirmatory Factor Analysis was conducted for the validity evidence of the structure of the two subscales consisting of five items each. Since the RMSEA value was greater than 0.05 and the χ^2⁄sd value was five and greater than five in the first CFA results, modifications were made by correlating the errors between the second (VAR7) and third (VAR8) items in the Basic Subscale and the fourth (VAR14) and fifth (VAR15) items

in the Advanced Subscale. The CFA results obtained before and after the modification and the limit values of the indices are given in Table 3.

Table 3. CFA Error and Fit Indices and Values Obtained as a Result of Modification

	Basic Subscale		Advanced Subscale	
Indices	Before modification	After modification	Before modification	After modification
$\chi^2/_{sd}$	10.21	2.20	4.96	1.88
RMSEA	0.17	0.06	0.11	0.05
SRMR	0.09	0.04	0.06	0.02
CFI	0.78	0.98	0.96	0.99
NNFI	0.56	0.94	0.92	0.98
GFI	0.94	0.99	0.97	0.99
AGFI	0.81	0.96	0.91	0.96

When Table 3 is analysed, it is seen that χ^2⁄sd and RMSEA values are not between the limit values taken as criterion in both scales before modification. After the modification, χ^2⁄sd value is less than 3; RMSEA and SRMR values are 0.05 and less than 0.05; CFI and NNFI values are greater than 0.90; GFI and AGFI values are greater than 0.95. Therefore, it can be said that the model-data fit of both subscales is generally excellent. The tested models and coefficients are shown in Figure 2.

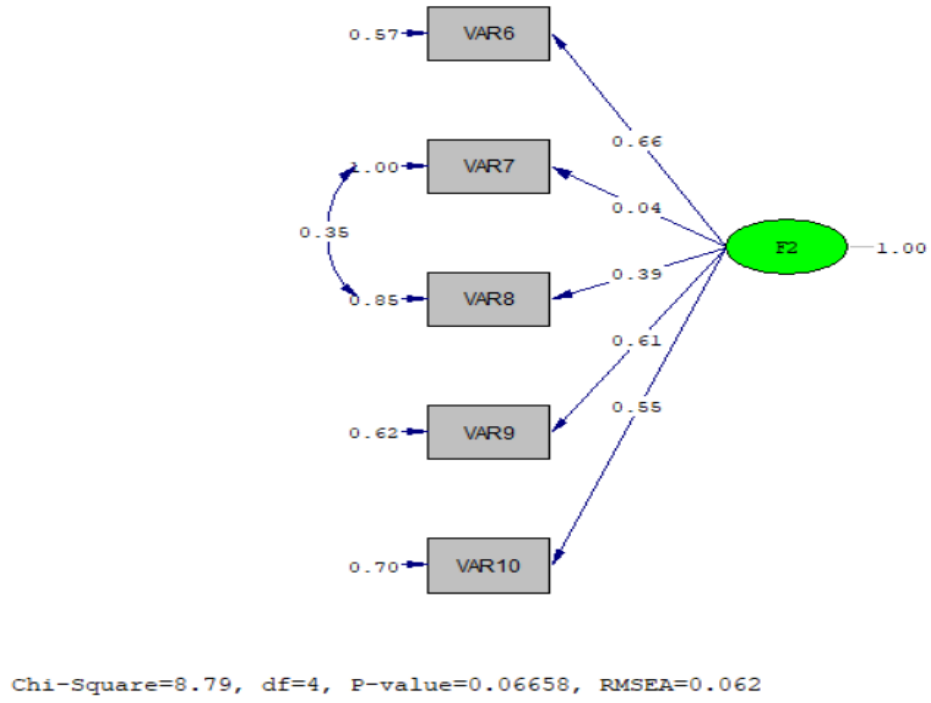

Figure 2. CFA Results for the Basic Subscale (Standard Coefficients)

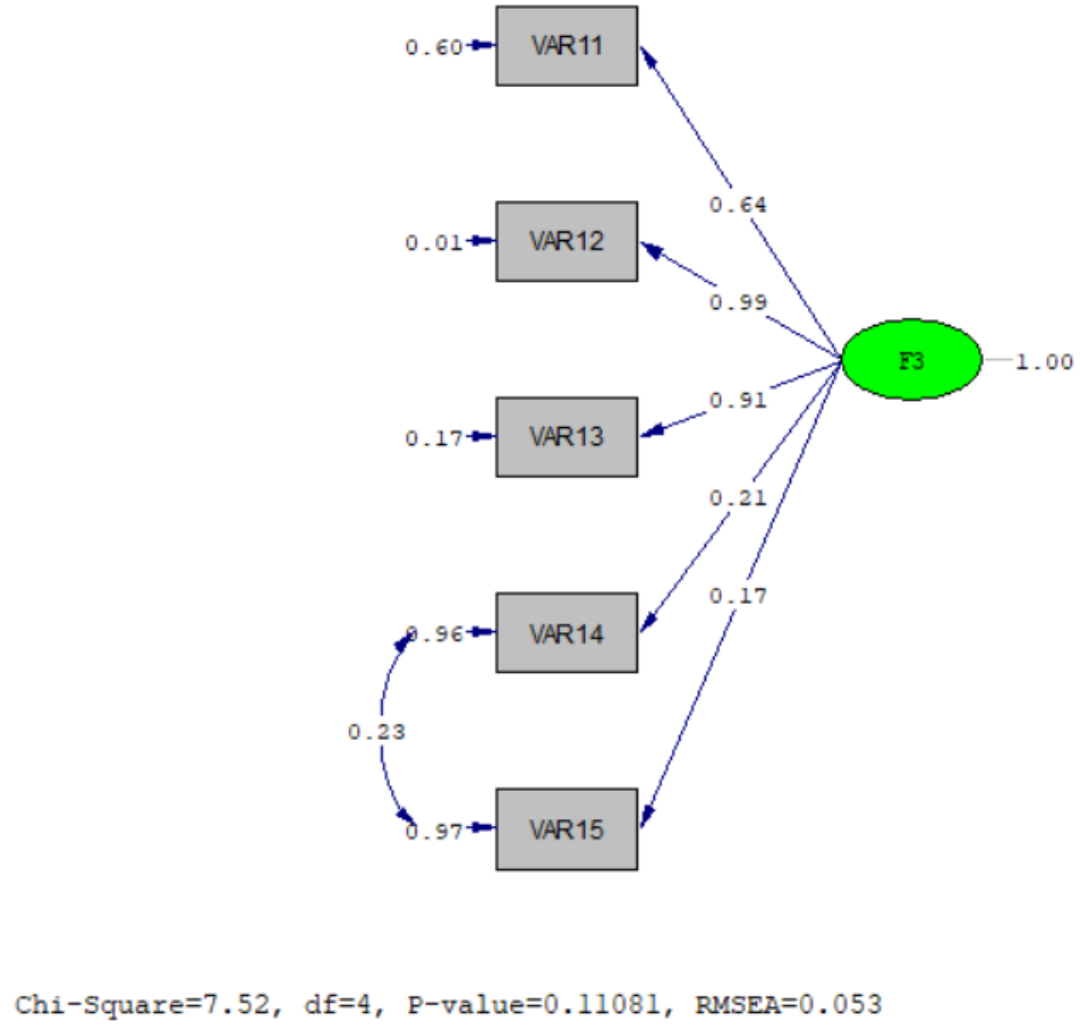

Figure 3. CFA Results for the Advanced Subscale (Standard Coefficients)

According to Figure 2 and Figure 3, the factor loadings are between 0.04 and 0.66 in the Basic Subscale and between 0.17 and 0.99 in the Advanced Subscale ($p<0.05$). The descriptive statistics of the scores of the children from the scales and the reliability coefficients for these dimensions are given in Table 4.

Table 4. Descriptive Statistics of the Scales and KR-20 Coefficient

	Number of Items	Min.	Max.	Mean	Standard Deviation	Skewness Error: 0.138	Kurtosis Error: 0.276	KR-20
TOMTB.F1	5	0	5	2.845	1.440	-0.362	-0.706	0.59
TOMTB.F2	5	0	5	1.355	1.491	0.921	-0.289	0.72

When Table 4 is examined, it is seen that the skewness and kurtosis coefficients of the score distributions obtained from the scales are between -1.5 and +1.5 (Tabachnick & Fidell: 2013). Thus, it can be said that the data have a normal distribution. When the KR-20 reliability coefficients are examined, it is seen that the coefficient is 0.59 for the Basic Subscale and 0.72 for the Advanced Subscale. The Pearson correlation coefficient between the scores obtained from these two scales was 0.193 ($p<0.05$). There is a low level of positive correlation between

the scales. The low correlation is due to the fact that the Theory of Mind Task Battery consists of independent scales. Test-retest reliability is 0.75 for the Basic Subscale and 0.76 for the Advanced Subscale ($p<0.05$). Therefore, it can be said that the reliability of the measurements obtained in terms of stability is also good.

4. CONCLUSION AND RECOMMENDATIONS

The study to adapt the Theory of Mind Task Battery (TOMTB) into Turkish and to conduct validity and reliability analyses for children aged 3-5 years. In this context, content validity (expert opinion) and construct validity (confirmatory factor analysis) were examined for the validity studies of the test. For content validity, the test was sent to 5 academicians, 1 of whom had a doctorate degree in guidance and psychological counselling and 4 of whom had a doctorate degree in child development and education, and expert opinions were obtained in terms of the suitability of the items to the relevant age group and developmental area in terms of the appropriateness of the way the items were presented. All experts reported that the items in the scale were necessary and appropriate. Therefore, all items in the original form were used in the data collection process. Confirmatory factor analysis was conducted to examine the construct validity of the Theory of Mind Task Battery (TOMTB). The reliability of the measurements in terms of internal consistency was calculated with KR-20, test-retest reliability and Pearson Correlation Coefficient. The analyses revealed that the Theory of Mind Task Battery (TOMTB) Basic and Advanced Subscales are valid and reliable measurement tools for 3-5 year old children.

The KR-20 reliability coefficient calculated for the reliability in terms of internal consistency of the adapted Theory of Mind Task Battery (TOMTB) was 0.59 in the Basic Sub-Scale and 0.72 in the Advanced Sub-Scale; test-retest reliability was 0.75 for the Basic Subscale and 0.76 for the Advanced Subscale. The fact that the KR-20 coefficient obtained from the 10-15-item tests is 0.50 and above indicates that the test is reliable (Alpar, 2022: 596). The Pearson correlation coefficient between the scores obtained from these two scales was 0.193 ($p<0.05$). Pearson correlation coefficient between 0.00 and 0.19 indicates a low level of correlation (Alpar, 2022: 444). The low correlation between the scales is due to the fact that the Theory of Mind Task Battery consists of independent scales ($p<0.05$). Therefore, it can be said that the reliability of the measurements obtained in terms of stability is also good.

In line with the results obtained in this study, it is thought that the application of the scale in a larger sample may positively affect the validity and reliability levels of the scale.

REFERENCES

Alpar, R. (2022). Spor sağlık ve eğitim bilimlerinden örneklerle uygulamalı istatistik ve geçerlik güvenirlik spss de çözümleme adımları ile birlikte. Ankara: Detay Yayıncılık.

Astington, J. W., & Edward, M.J. (2010). The development of theory of mind ın early childhood. Social Cognition. http://www.child-encyclopedia.com/documents/Astington-EdwardANGxp.pdf.

Astington, J. W. (2003). Sometimes necessary, never sufficient false-belief understanding and social competence (Ed.: Betty Repacholi, Virginia Slaughter). Individual differences in theory of mind: Implications for typical and atypical development. New York and Hove: Psychology Press, 14-39.

Astington, J.W. (2020). The developmental interdependence of theory of mind and language. (Ed. Nicholas J.Enfield & Stephen C.Levinson), Roots Of Human Sociality Culture, Cognition And Interaction, New York: Routledge, 179- 206.

Baron Cohen, S., Leslie, A.M. & Frith, U. (1985). “Does the autistic child have a “theory of mind” Cognition 21: 37–46. doi: 10.1016/0010-0277(85)90022-8.

Bartsch, K. & Wellman, H.M. (1995). Children talk about the mind, Oxford University Press, New York.

Çokluk, Ö., Şekercioğlu, G. & Büyüköztürk, Ş. (2018). Sosyal bilimler için çok değişkenli istatistik: SPSS ve Lisrel uygulamaları (5. Baskı), Ankara: Pegem Akademi Yayıncılık.

Hu, L. & Bentler, P. M. (1999). Cutoff Criteria for fit ındexes ın covariance structure analysis: conventional criteria versus new alternatives. Structural Equation Modeling, 6, 1-55.doi: 10.1080/10705519909540118.

Hughes, C., Jaffee, S. R., Happé, F., Taylor, A., Caspi, A. & Moffitt, T. E. (2005). Origins of individual differences in theory of mind: From nature to nurture?. Child Development, 76(2), 356-370.doi: 10.1111/j.1467-8624.2005.00850_a.x.

Karmiloff Smith, A. (2010). Onto- and phylogenetic considerations (Ed.: Britt M. Glatzer, Vinod Goel, Albrecht Von Müller). Towards a theory of thinking building blocks for a conceptual framework, Springer-Verlag Berlin Heidelberg.

Keenan, T. (2003). Individual differences ın theory of mind the preschool years and beyond (Ed.: Betty Repacholi, Virginia Slaughter) Individual differences in theory of mind: Implications for typical and atypical development. New York And Hove: Psychology Press, 122-143.

Kline, R. B. (2015). Principles and practice of structural equation modeling. (4. Edition). NY: Guilford Publications, Inc.

Kuhn, D. (2000). Theory of mind, metacognition, and reasoning: A life-span perspective. (Ed.: Peter Mitchell & Kevin Riggs), Children's reasoning and the mind. Hove: Psychology Press. 301–326.

Leslie, A. M. (1987). Pretense and representation: The origins of "Theory Of Mind.". Psychological Review, 94(4), 412-426.

Malle, B. F. (2005). Folk theory of mind: Conceptual foundations of human social cognition (Ed.: Ran R. Hassin, James S. Uleman, John A. Bargh). The New Unconscıous. New York: Oxford University Press, 223-255.

McElwain N.L, Ravindran N., Emery H.T. & Swartz R. (2019). Theory of mind as a mechanism linking mother–toddler relationship quality and child–friend interaction during the preschool years. Social Development. 1–18. doi: 10.1111/sode.12377.

Repacholi, B., Slaughter, V., Pritchard, M. & Gibbs, V. (2003). Theory of mind, machiavellianism, and social functioning in childhood (Ed.: Betty Repacholi, Virginia Slaughter). Individual differences ın theory of mind: ımplications for typical and atypical development. New York And Hove: Psychology Press, 68-98.

Ruffman, T., Perner, J., Naito, M., Parkin, L. & Clements, W. A. (1998). Older (but not younger) siblings facilitate false belief understanding. Developmental Psychology, 34(1), 161-174.

.

Scholl, B. J. & Leslie A.M. (1999). Modularity, development and 'theory of mind. Mind & Language, 14(1), 131-153.

Schumacker, R. E. & Lomax, R. G. (2004). A Beginner's guide to structural equation modeling. (2. Edition). NJ: Lawrence Erlbaum Associates, Inc.

Slaughter, V., Imuta, K., Peterson, C. C. & Henry, J. D. (2015). Meta-Analysis of theory of mind and peer popularity ın the preschool and early school years. Child Development, 86(4), 1159-1174. doi: 10.1111/Cdev.12372.

Slaughter, V. & Repacholi, B. (2003). Introduction: individual differences in theory of mind what are we ınvestigating? (Ed.: Betty Repacholi, Virginia Slaughter) Individual differences ın theory of mind: ımplications for typical and atypical development. New York And Hove: Psychology Press, 1-13.

Sodian, B. & Kristen, S. (2010). Theory of mind (Ed.: Britt M. Glatzeder, Vinod Goel, Albrecht Von Müller). Towards a theory of thinking building blocks for a conceptual framework, Springer, 189-202.

Şahin, B., Bozkurt, A., Usta, M. B., Aydın, M., Çobanoğlu, C. ve Karabekiroğlu, K. (2019). Zihin kuramı: gelişim, nörobiyoloji, ilişkili alanlar ve nörogelişimsel bozukluklar. Psikiyatride Güncel Yaklaşımlar, 11(1), 24-41.

Tabachnick, B. G. & Fidell, L. S. (2013). Using multivariate statistics (6.Edition), Pearson Education, Inc.

Thompson, B. (2004). Exploratory and confirmatory factor analysis: Understanding concepts and applications. (1. Edition). NY: Psychology Press.

Wellman, H. M. (1990). The child's theory of mind. The MIT Press.

Wellman, H.M. (2011). Developing a theory of mind (Ed.: Usha Goswami). The Wiley-Blackwell handbook of childhood cognitive development (2. Edition). United Kingdom: A John Wiley & Sons, Ltd. Publication, 258-284.

Wellman, H.M. (2014). Making minds how theory of mind develops, Oxford University Press.

Wellman, H. M. (2017). The Development of theory of mind: Historical reflections. Child Development Perspectives, 11(3), 207-214. doi: 10.1111/Cdep.12236.

Welsh, C. (2021). Theory of mind and evidence of brain modularity (Ed.: Todd K. Shackelford, Viviana A. Weekes-Shackelford). Encyclopedia of evolutionary psychological science, Springer International Publishing, 8143-8144.

Wimmer, H. & Perner, J. (1983). Beliefs about beliefs: representation and constraining function of wrong beliefs ın young children's understanding of deception. Cognition, 13: 103–114.

Zufferey, S. (2010). Lexical pragmatics and theory of mind: The acquisition of connectives. John Benjamins Publishing Company.

Funding: The authors declare that no funds, grants, or other support were received during the preparation of this manuscript

Ethical Approval: The ethics committee approval of KTO Karatay University Non-Pharmaceutical and Non-Medical Device Research Ethics Committee dated 18/06/2019 and numbered 41901325-050.99 was obtained for the study. Research and publication ethics were complied with.

Consent to Participate: All authors have given their consent to participate in submitting this manuscript to this journal.

Consent to Publish: Written consent was sought from each author to publish the manuscript.

Competing Interests: The authors have no relevant financial or non-financial interests to disclose.