

# Preliminary Normative Data for the Turkish Form of the KiddyCAT

## KiddyCAT'in Türkçe Formu İçin İlk Normatif Veriler

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**ABSTRACT Objective:** The purpose of this study was to obtain preliminary normative data for children who stutter (CWS) and children who do not stutter (CWNS) for the Turkish form of the KiddyCAT, and to determine whether differences in communication attitude exist among CWS and CWNS. **Material and Methods:** Following the translation process of the original English version into Turkish, the Communication Attitude Test for Preschool and Kindergarten Children Who Stutter (KiddyCAT-TR) was administered to 53 Turkish preschool CWNS and 55 who stutter CWS. The KiddyCAT-TR scores were evaluated to determine whether the CWS differ by chronological age, younger age versus older age groups and gender. **Results:** The Cronbach's alpha coefficient was obtained 0.72 for the CWS. The effect size found very high ( $d=1.14$ ). The test-retest reliability coefficient was determined as 0.99. Group comparisons showed significantly higher mean scores for CWS compared to CWNS. Gender did not affect the test results. **Conclusion:** CWS develop a negative attitude towards their own communication from a very early age, which increases as they grow older. The results showed that the Turkish version of the KiddyCAT has high internal consistency and test-retest reliability and is a solid differential diagnostic tool to gauge the speech-related attitude among Turkish-speaking preschoolers.

**Keywords:** KiddyCAT; stuttering; communication attitude; preschoolers; Turkish children

**ÖZET Amaç:** Bu çalışmanın amacı, KiddyCAT'in Türkçe formu için kekeleyen ve kekelemeyen çocuklar için ön normatif veriler elde etmek ve kekeleyen ile kekelemeyen çocuklar arasında iletişim tutum farklılıkları olup olmadığını belirlemektir. **Gereç ve Yöntemler:** Orijinal İngilizce versiyonun Türkçeye çevrilmesi sürecini takiben, 53 kekelemeyen ve 55 kekeleyen Türk okul öncesi dönemdeki çocuğa KiddyCAT-TR uygulandı. Kekeleyen çocukların kekelemeyen çocuklara göre KiddyCAT-TR'den aldıkları puanları, kronolojik yaşa, daha küçük yaşa karşı büyük yaş gruplarına ve cinsiyete göre farklılık gösterip göstermediklerini belirlemek için değerlendirildi. **Bulgular:** Cronbach alfa katsayısı kekeleyen çocuklar için 0,72 elde edildi. Etki büyüklüğü çok yüksek bulundu ( $d=1,14$ ). Test-tekrar test güvenilirlik katsayısı 0,99 olarak belirlendi. Grup karşılaştırmaları, kekelemeyen çocuklara kıyasla kekeleyen çocuklar için önemli ölçüde daha yüksek ortalama puanlar gösterdi. Cinsiyet, test sonuçlarını etkilemedi. **Sonuç:** Okul öncesi dönemde kekeleyen çocuklar, çok erken yaşlardan itibaren kendi iletişimlerine karşı olumsuz bir tutum geliştirir ve bu durum yaşları ilerledikçe artar. Sonuçlar, KiddyCAT'in Türkçe versiyonunun yüksek iç tutarlılığa ve test-tekrar test güvenilirliğine sahip olduğunu ve Türkçe konuşan okul öncesi çocuklar arasında konuşma ile ilgili tutumu ölçmek için sağlam bir teşhis aracı olduğunu göstermektedir.

**Anahtar Kelimeler:** KiddyCAT; kekemelik; iletişim tutumu; okul öncesi dönem; Türk çocukları

Stuttering, a disorder characterized by observable behaviors such as repetitions, prolongations and blocks, has a multi-faceted nature beyond the observed dysfluencies in question.<sup>1,2</sup> Therefore, during the management of stuttering, it is not enough to

focus only on its surface features. In addition to these visible and audible symptoms that interrupt the forward flow of speech, factors such as the stuttering individual's coping behaviors, negative emotional reaction and attitude towards their speech should also

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be considered for effective intervention to occur.<sup>3</sup> The Behavior Assessment Battery (BAB), for example, was developed to evaluate the ways in which individuals cope with stuttering and the extent of their speech-specific anxiety and mal-attitude. It is well demonstrated that this tool, adopting a multi-component and evidence-based approach, can be used to make diagnostic and therapeutic decisions for both adults and school-age children.<sup>3-5</sup>

Following studies that focus on the speech-associated attitude of adults and school-aged children, Vanryckeghem, et al. investigated if a negative speech-associated attitude might already be present among preschool and kindergarten children who stutter (CWS).<sup>6-9</sup> A short self-report assessment of attitude toward speech was developed for this purpose. The Communication Attitude Test for Preschool and Kindergarten Children Who Stutter or KiddyCAT allows the clinician to determine whether a child's attitude toward their speech is typical or atypical, that is, specific to children who do not stutter (CWNS) or who stutter.<sup>10</sup>

Evaluating the speech-associated belief system augments therapists' understanding of children's behavioral and emotional responses.<sup>3</sup> Affect, cognition and behavior have an integrative effect in understanding stuttering and evaluation of these components sheds light on the individual who stutters.<sup>3</sup> Irrational cognition strengthens stuttering behavior and prevents people who stutter to cope with their problems in a constructive manner. Moreover, they can stabilize more permanent negative attitude towards communication competence.<sup>11</sup> The premise of negative communication attitude is awareness about the communication/speaking competence of the person.<sup>12</sup> 'Awareness', which is assumed to interact with the onset and development of stuttering, involves being partially or acutely aware of speech difficulties or stuttering.<sup>13</sup>

Children begin to compare their competences with their peers and start to realize in what aspects they differ from their cohort in the preschool period.<sup>14</sup> Awareness of speaking and communication competency in CWS also starts at a young age and may contribute to the development of negative attitude toward one's speech early on.<sup>7,13</sup> Boey et al. reported that,

among 1,122 CWS with an average age of 54 months, 64% of the participants developed awareness about their speech difficulty as soon as they started stuttering and that awareness increased with age, with 89.7% of their 7-year-old participants showing stuttering awareness.<sup>13</sup> Eighteen percent of the parents who participated in Yairi's study reported that their children noticed their stuttering very close to the onset of stuttering.<sup>15</sup> Taking these awareness studies a step further, a direct study with CWS confirmed Yairi and colleagues' data and revealed that CWS, as a group, have already formed a negative communication attitude close to the onset of stuttering.<sup>9,15-18</sup> Awareness is the precondition for developing beliefs and attitudes, and is an integral part of attitude.<sup>9,12</sup> Once aware, preschool CWS evaluate their stuttering negatively and the time between awareness and negative attitude development during preschool ages is quite short.<sup>9,19</sup> It is also reported that "early conceptions of communicative abilities among CWS are influenced by their stuttering experiences and diverge from early communicative ability conceptions among their fluent peers".<sup>20</sup> Guttormsen et al.'s study reported that communication attitude tends to increase with age, and that negative communication attitude may influence the further development or persistence of stuttering.<sup>21</sup>

Children who constantly experience negative speaking experiences when stuttering, are aware of both their non-fluent speech and the verbal or non-verbal reactions from the environment. They subsequently develop a belief in the competence of speech and communication that is mostly negative.<sup>9,10,12,19</sup> Such negative orientation towards one's own communication performance negatively affects the social-emotional development of an individual.<sup>22</sup> The time span between the emergence and recognition of stuttering is short, and the earlier stuttering is noticed, the earlier a negative attitude is bound to develop.<sup>12,19,23</sup> Revealing the communication attitude of individuals, one of the risk factors for persistent stuttering is a very determining and sensitive point in early stuttering management.<sup>13,16,21,24</sup> Ascertaining whether young CWS develop a negative attitude towards their speech plays a crucial role in assessment and therapy.<sup>10,16,24,25</sup> Following this, management of stuttering

during the preschool period may prevent social problems that are typically encountered at later school ages.<sup>26</sup> One of the most important indicators of a preschooler's need for therapy is whether the child has developed a negative attitude towards their own speech and communication competence.<sup>24,27</sup> The KiddyCAT contributes to this clinical decision-making process by evaluating the communication attitude of preschool CWS.<sup>18</sup> In addition, determination of attitude toward speaking could provide a clinician with important cues about the potential for recovery.<sup>24</sup>

The KiddyCAT as a communication attitude assessment tool helps clinicians in determining whether the child has developed a negative attitude, supporting differential diagnosis, predicting prognosis, deciding whether to start therapy, optimal timing of treatment for particular children, deciding the direction and type of treatment (i.e. whether to address negative thoughts), and monitoring whether therapy is providing effective results.<sup>10,18,21,24,27,28</sup> It is important for stuttering treatment to be successful to not only focus on increasing speech fluency but also to ensure that the child perceives their communication efficiency as positive.<sup>21</sup> In this regard, Guttormsen et al. suggested that pre-and post-treatment measurement of communication attitude is necessary to determine whether signs of negative attitude have had an effect on the outcome of the therapy program.<sup>21</sup> In addition, negative attitude signs still present after treatment may indicate a risk for relapse.<sup>28,29</sup>

The KiddyCAT has been translated and adapted in different languages and researched in cross-cultural investigations.<sup>16-19,30-32</sup> These studies indicate that the KiddyCAT has the capability to distinguish CWS from CWNS in terms of negative attitude towards their own communication and that it is a reliable and valid tool.

Considering the above findings on the importance of assessing children's attitude towards their speech and the KiddyCAT's established contribution to early stuttering management efforts, lack of such standardized and norm-based tools in Turkey hinders clinical practice and research. In line with this void, the present study aims to translate the KiddyCAT into

Turkish, to obtain preliminary normative data for CWS and CWNS for the Turkish form of the KiddyCAT, and to determine whether a difference in communication attitude exists among CWS and CWNS.

## MATERIAL AND METHODS

### ETHICAL CONSIDERATIONS

The necessary permissions were obtained from Martine Vanryckeghem and the required approvals were obtained from Üsküdar University Ethics Commission (no: B.08.6.YÖK.2.ÜS.0.05.0.06/2018/1067, date: 24.12.2018) prior to the study. This study was conducted in accordance with the Helsinki Declaration principles. The family of each participant signed an informed consent form stating they were willing to participate in the study.

### TRANSLATION PROCESS OF THE KIDDYCAT

In the process of adapting the KiddyCAT for the Turkish population of preschoolers and kindergartners, a translation as close as possible to the original version was aimed for. The translation of the test instruction and its items from English to Turkish was done by two different speech-language therapists (SLT) who are proficient in both languages. The two translations were compared by the second author to achieve a common text and was back translated into English by two different SLTs who master both languages. Attention was paid to ensure that the items and instruction conform to the Turkish culture. The test's Turkish translation and adaptation to the Turkish culture was then discussed in a Skype meeting with the fourth author (the test developer), to meet the semantic requirements of the test and to agree on conceptual and cultural suitability issues of the terms used in the instruction and the test items, e.g. hard and difficult terms. During this process, the Turkish version of the instructions and test items were simultaneously translated by the second author into English without referring to the original English text. Hence, it was agreed by the test developer that the Turkish version of the test (KiddyCAT-TR) meets the semantic content and the intended aims of the original KiddyCAT version.

## PARTICIPANTS

The participants of the study were all native Turkish speakers, 108 children between 3:00-6:11 yrs: 53 CWS (12 girls, 41 boys) and 55 CWNS (30 girls, 25 boys), The mean age for the CWS sample was 59.66 months (SD=12.75), and for the CWNS it was 55.55 months (SD=11.86).

In order to determine which children can participate in the study, parents, teachers and SLTs were asked to indicate if the child meets the following criteria: For CWNS; a) speaks Turkish as the native language and no other language is spoken at home, b) not diagnosed with mental deficiency, hearing impairment, neurological disorder, developmental delay, and speech and language disorder, c) for CWS, no language and speech disorder other than stuttering; the onset of stuttering was six months prior to data collection, and they have all been in speech therapy for one to six months. CWS were contacted in various clinical centers, private speech and language therapy/disorder clinics and universities or private hospitals' SLT clinics in İstanbul and Kocaeli, and CWNS were recruited from four kindergartens in İstanbul. Both İstanbul and Kocaeli are industrial cities that attract inhabitants from all over Turkey, and thus represent the cultural diversity of the country.

## DATA COLLECTION

The KiddyCAT-TR was administered to the CWS in a quiet room in the clinic where they received treatment, and to the CWNS in a quiet room/classroom of the kindergarten they attended, by the first author, four research assistants who were individually trained and SLT who was familiar with test administration.

According to the test protocol, the administrator explained to the child what was going to be done and asked two simple practice questions to help the child understand what the administrator wanted. For each of the 12 questions, a marble ball was given to the child upon answering and was placed in one of the 12 spaces in an egg box. When all spaces in the box were filled, the child was given a reward (sticker). During the test, the administrator carefully observed the child and their behaviors. When the child constantly gave the same answer (yes or no) to the questions, suggesting a set response, two "dummy" questions were asked after the

5<sup>th</sup> and 10<sup>th</sup> question, to see if the child gave an expected answer which was contradictory to the set answers that the child gave before. For example, when the child repeatedly replied "yes" to questions, the test administrator asked "Can you fly?". The answer to the test questions is scored as 0 when it reflects a positive communication attitude, and 1 when it indicates negative thinking. The total score can be between 0 and 12. The higher the score, the more negative the communication attitude of a child is. The test took approximately 15 minutes to complete.

To determine the test-retest reliability, the test was given to 20 CWS and 20 CWNS of the participants a second time, one week after the first test date.

## STATISTICAL ANALYSIS

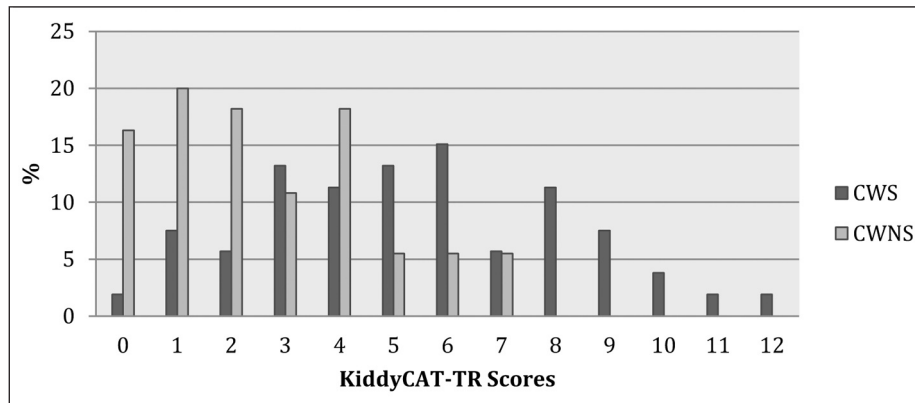
"Statistical Package for Social Sciences (SPSS) 25" was used for statistical analysis of this study. Shapiro Wilk test was used to test normality. Because the groups' scores were distributed normally among CWS and CWNS, a t-test was used for group comparison. Cohen's effect size determined the degree of the score difference. The subgroups of the study, age and gender, did not show normal distribution so non-parametric tests were preferred. Independent samples Mann-Whitney U and Kruskal-Wallis H tests were used for age and gender variables comparisons; KR-21 coefficients were used for reliability determination of this scale with binary questions. A Pearson correlation coefficient was calculated for test-retest reliability of the KiddyCAT-TR. For all statistical comparisons, a p value <0.05 was assumed as statistically significant.

## RESULTS

### BETWEEN-GROUP TOTAL SCORE ANALYSIS

As can be seen in [Table 1](#), the KiddyCAT-TR scores ranged between 0-7 for the CWNS whereas the scores of the CWS spanned the whole spectrum (0-12). Of note is that the modal score for CWNS was 1, while this score was 6 for CWS. [Figure 1](#) shows the score distributions of the CWS and CWNS participants.

The KiddyCAT-TR scores were tested for between-group significance using a t-test which yielded a significant difference between the test scores of CWS



**FIGURE 1:** Distribution in percentage of the 12-item the KiddyCAT-TR scores for 53 CWS and 55 CWNS.  
CWNS: Children who do not stutter; CWS: Children who stutter.

and CWNS ( $t=5.887$ ,  $p=0.000$ ), and the degree of this difference appeared to be high (Cohen's  $d=1.14$ ). The group difference in the scores was also made clear by means of discriminant analysis. The KiddyCAT-TR correctly classified 70% of CWS, 82% of CWNS and %76 the total group.

#### GENDER AND AGE ANALYSIS

Whether gender has an effect on the total test score was also examined. The results of this analysis are given in [Table 2](#). The difference between the mean of the female ( $M=5.33$ ,  $SD=2.42$ ) and male CWS ( $M=5.41$ ,  $SD=2.96$ ) was not found to be statistically significant ( $U=245.5$ ,  $z=0.01$ ,  $p=0.99$ ). Similarly, the difference between the mean of the female CWNS ( $M=2.47$ ,  $SD=1.91$ ) and that of the male ( $M=2.76$ ,  $SD=2.20$ ) was not statistically significant ( $U=351.00$ ,  $z=-0.41$ ,  $p=0.68$ ).

In order to examine the effect of age on KiddyCAT-TR scores, an analysis was carried out in the younger (3.0-4.11) and older (5.0-6.11) age groups. As can be seen in [Table 3](#), the KiddyCAT-TR mean scores of CWS descriptively increased with age and the mean scores of the CWNS decreased with age. Whereas the numerical increase in scores for CWS was not statistically significant ( $U=411.00$ ,  $p=0.283$ ) in terms of age (young/old), it was a significant ( $U=125.00$ ,  $p=0.000$ ) for the CWNS groups.

#### RELIABILITY

The results of Cronbach's alpha analysis of the KiddyCAT-TR items indicated an internal consistency

**TABLE 1:** Measures of central tendency and variation for CWNS and CWS (n=108).

	CWNS (n=55)	CWS (n=53)
Mean	2.60	5.40
SD	2.03	2.82
Median	2	5
Mode	1	6
Minimum	0	0
Maximum	7	12

SD: Standard deviations; CWNS: Children who do not stutter; CWS: Children who stutter.

**TABLE 2:** Means and SD of male and female CWNS and CWS male and female on the KiddyCAT-TR.

	Male (n=66)		Female (n=42)	
	CWNS	CWS	CWNS	CWS
n	25	41	30	12
Mean	2.76	5.41	2.47	5.33
SD	2.20	2.96	1.91	2.42

CWNS: Children who do not stutter; CWS: Children who stutter; SD: Standard deviations.

**TABLE 3:** Means and SD of younger (3.00-4.11) and older (5.00-6.11) CWNS and CWS on the KiddyCAT-TR.

	CWNS (n=55)		CWS (n=53)	
	3.00-4.11	5.00-6.11	3.00-4.11	5.00-6.11
n	33	22	26	27
Mean	3.48	1.27	4.96	5.81
SD	1.9	1.42	2.23	3.28

CWNS: Children who do not stutter; CWS: Children who stutter; SD: Standard deviations.



of 0.72 for the group of CWS and 0.65 for the CWNS group. Test-retest reliability data, comparing the first and second test administration, revealed a very high correlation ( $r=0.99$ ,  $p<0.00$ ).

## DISCUSSION

The aim of this study was to translate and to adapt the original version of the KiddyCAT into Turkish and to obtain normative data for preschool children, to investigate the internal consistency and reliability of the Turkish version of the KiddyCAT, to determine whether the attitude of Turkish-speaking preschool CWS and CWNS towards their speech differs and to investigate if gender and age have an influence on communication attitude.

Similar to other internal consistency and reliability studies of the KiddyCAT, the KiddyCAT-TR was found to be a reliable tool with high internal consistency for the group of CWS and CWNS, and very strong test-retest reliability.<sup>16-19,30,32</sup>

Once again it was confirmed that the KiddyCAT-TR is capable of differentiating CWS from CWNS as it relates to speech-associated attitude. The level of differentiation between the groups based on the KiddyCAT-TR scores was found to be high as indicated by Cohen's *d*. The present result for Turkish children indicating that the KiddyCAT-TR differentiates between CWS and CWNS is in line with studies performed in other cultures, e.g. Slovenia (Cohen  $n^2=0.485$ ), USA (Cohen's  $d=1.44$ ), Germany (Cohen's  $d=1.37$ ) and Italy ( $np^2=0.26$ ). The data from this study confirm once more that also the speech-related attitude of Turkish-speaking CWS is significantly more negative compared to that of their non-stuttering peers, as seen in other countries.<sup>16-19,32</sup>

The findings of the current study are similar to those of other cross-cultural studies showing that gender does not affect communication attitude.<sup>17,18,32,33</sup> In addition, as it relates to the effect of age on the establishment of negative speech-associate attitude, the present study results are comparable to those of the studies conducted in other countries. The findings show that the negative attitude of preschool CWS towards speech do not differ significantly between

younger and older age groups. CWS seem to have a negative attitude toward their communication performances from a very early age. The scores of the CWNS participants of our study decreased with age as is seen in other cross-cultural studies.<sup>17,32</sup> The fact that the limited negative speech-associated attitude of the nonstuttering participants is higher at younger ages can be explained by the development of speech and language. Clark et al. reported that a single strong dimension of the KiddyCAT reflects a child's perception that speaking is difficult and that CWNS perceive speaking to get easier as they grow up.<sup>19</sup>

In summary, considering the cross-cultural KiddyCAT findings, it can be said that 1) the attitude of CWS towards their own speech is significantly more negative than that of their nonstuttering peers, 2) negative speech-associated attitude is not affected by gender, 3) a negative belief towards speech starts to develop in CWS as young as 3 years of age and increases with age, and 4) the effect of stuttering has on the child does not differ in the cultures investigated so far.

It is known that a negative attitude about speech begins to develop in the preschool years and with time, when stuttering persists, this negative attitude becomes part of what defines the individual who stutters, and is an integral part of chronic stuttering.<sup>5,7,19,24,34</sup> In the decision-making process of early childhood stuttering diagnostics and treatment, many factors specific to stuttering, including child and parents, should be evaluated in order to foresee the potential for spontaneous recovery or risk for chronic stuttering.<sup>23</sup> One of these factors is evaluation of the negative communication attitude, which is also important for the clinical decision process.<sup>27</sup> In addition, incorporating this cognitive component in treatment is known to be an effective factor in its success and the maintenance of treatment gains.<sup>21,35</sup> In this vein, the KiddyCAT is a valid, reliable and practical tool that aids therapists in determining the child's attitude towards their speech, and guides treatment.

## CONCLUSION

Through this study, it was found that the Turkish version of KiddyCAT is a tool with high internal con-

sistency and test-retest reliability that can be used for clinical or research purposes with preschool CWS. It is an easy and practical self-report test that helps in revealing negative communication attitude in young CWS between the ages of 3 and 6, is useful in differential diagnosis of early childhood stuttering and treatment goal setting.

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### Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

### Authorship Contributions

**Idea/Concept:** Seçil Aydın Oral; **Design:** Seçil Aydın Oral; **Control/Supervision:** Ahmet Konrot, Evrim Gerçek; **Data Collection and/or Processing:** Seçil Aydın Oral, Ahmet Konrot; **Analysis and/or Interpretation:** Seçil Aydın Oral, Ahmet Konrot, Evrim Gerçek, Martine Vanryckeghem; **Literature Review:** Seçil Aydın Oral, Evrim Gerçek; **Writing the Article:** Evrim Gerçek, Seçil Aydın Oral; **Critical Review:** Martine Vanryckeghem, Ahmet Konrot; **References and Fundings:** Seçil Aydın Oral; **Materials:** Seçil Aydın Oral.

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