

# Psychometric Properties of the Sluggish Cognitive Tempo Scale in a Turkish Sample of Children and Adolescents

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## Abstract

Sluggish Cognitive Tempo (SCT) has been proposed as a serious problem of attention, however there no validated psychometric measures for its evaluation in Turkish in a community sample. The present study aimed to examine the psychometric characteristics of the first SCT scale in Turkish in children and adolescents. A total of 418 children and adolescents between the ages of 6-18 years ( $9.83 \pm 2.8$ ) were recruited. The data was obtained from parents using Sluggish Cognitive Tempo Scale and Strengths and Difficulties Questionnaire. The SCT scale-Turkish form demonstrated very good internal homogeneity (Cronbach's  $\alpha = .90$ ), good test-retest reliability ( $r = .98$ ), good concurrent validity ( $r$  range = .35- .65) and good construct validity. Goodness of fit indices were found to be acceptable and statistically significant associations were found between SDQ and SCT scales. The SCT scale is a valid and reliable instrument in Turkish children and adolescents. (*J. of Att. Dis.* XXXX; XX(X) XX-XX)

## Keywords

adolescents, children, sluggish cognitive tempo, reliability, validity

Although attention-related problems that impair functionality in children and adolescents are most frequently associated with Attention Deficit Hyperactivity Disorder (ADHD), they can also be a symptom of a large number of mental disorders (Barkley, 2014). ADHD is described with three different sub-types in the American Psychiatric Association Diagnostic Handbook, 5th Edition (DSM-5): Inattentive type, Hyperactive/Impulsive type, and Combination type (American Psychological Association [APA], 2013). However, DSM-5 ADHD diagnostic criteria do not meet some of the symptoms of children experiencing attention problem (Barkley, 2014). This situation has led researchers to conduct studies to define symptom clusters related to attention problems more accurately and to find out as to what extent these symptom clusters were associated with ADHD.

The term “Sluggish Cognitive Tempo” (SCT) is used to define a group of attention problems that DSM-5 ADHD diagnostic criteria do not meet (Barkley, 2013). SCT first emerged in the middle of the 1980s in ADHD literature, and it consists of symptoms including daydreaming, drowsiness, confusion, sleepy appearance, and hypoactivity (Barkley, 2012, 2013; Lahey et al., 1988). Although it is strongly associated with ADHD, it has been emphasized in a large number of studies that SCT symptoms create a different symptom cluster than inattention and hyperactivity/impulsivity symptoms (Barkley, 2012, 2013; Bauermeister et al., 2012; Burns et al., 2013; Willcutt et al., 2014). In

studies examining the validity of SCT symptoms in children, it has been reported that SCT exists as a separate situation from ADHD in different cultures (Belmar et al., 2017; Burns et al., 2013; Lee et al., 2016; Markovich-Pilon et al., 2017). Further studies have been suggested to demonstrate the cultural validity of SCT (Becker et al., 2019).

When considered in terms of comorbid disorders, there are also studies advocating that SCT differentiates from ADHD. In these studies, while ADHD was found to be more associated with externalized disorders such as oppositional defiant disorder and conduct disorder, it was emphasized that SCT had a stronger association with internalized disorders such as depression and anxiety disorder (Becker et al., 2014; Burns et al., 2013; Lee et al., 2014; Penny et al., 2009). Social difficulties and introversion associated with SCT cause these children to be ignored by their peers, resulting in impairment in functionality (Becker et al., 2019). For a mental disorder, the most decisive external criterion is evidence that the disorder is associated with

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distress or functional impairment that is sufficiently severe to warrant intervention (Becker et al., 2016). The fact that SCT has a separate symptom cluster, it is differentiated from ADHD in terms of comorbid disorders, cause impairment in functionality on its own accord and that there is evidence about its validity in different cultures, support the view that SCT can be evaluated as a separate structure from ADHD (Willcutt et al., 2014). The view that it can be a separate disorder has revealed the need for measurement instruments to evaluate this structure. In studies conducted until 2009, different symptom clusters were used by researchers to define the concept of SCT (Hinshaw, 2002; Lahey et al., 1988; McBurnett & Pfiffner, 2005; Pfiffner et al., 2007). The first scale, which was developed by Penny et al. (2009) consisted of 14 symptoms and the following three sub-dimensions; slow, sleepy, and daydreamer.

The 12-item Child SCT Ratings, based on the Penny SCT scale, was used in a study conducted by Barkley (2013) in a large sample of 6 to 17 years old children and adolescents. The internal consistency of 12 items (Cronbach's alpha) was found to be .934. These items were translated into Turkish by the name of Barkley Child Attention Scale by Firat et al. (2018). As a result of the Exploratory and Confirmatory Factor analyses in a sample of 291 children with ADHD, the scale was reported to be a valid and reliable measurement tool in evaluating SCT symptoms in Turkish children between the ages of 6 to 12 years. The Turkish form showed some differences from the original form. Unlike the original study, the items "has difficulty staying alert or awake" and "doesn't seem to understand or process questions or explanations as quickly or as accurately as others" were loaded on the "daydreaming" factor rather than on the "sluggishness" factor. It has been reported by the authors that this difference may be due to the fact that the study did not include individuals between the ages of 12 to 17 and was performed in a clinical sample, unlike the original study. Barkley Child Attention Scale was concluded to consist of a 2-factor structure, Sluggishness and Daydreaming (Firat et al., 2018).

Although there is only one measurement instruments of which psychometric properties were examined in Turkish for evaluating the concept of SCT, and there is no validated instrument in Turkish to measure the SCT related symptomatology in a community sample Examining the concept of SCT more commonly and obtaining data from Turkey about the validity of this phenomenon is possible with Turkish measurement instruments becoming more widespread. Therefore, this study aims to examine the psychometric characteristics of the first SCT scale in Turkish with the participation of children and adolescents between the ages of 6 to 18. Secondly, the sociodemographic data obtained from the sample will be presented as the first community data about the SCT profile of children and adolescents in Turkey. In addition, in line with the

current literature, predicting that SCT symptoms affect peer relationships negatively, the effect of SCT symptoms on peer relationships will be examined.

## Method

The sample of the study consisted of 1st to 12th graders aged between 6 and 18 years. In order to conduct a scale validity and reliability study, it is recommended in the literature that the minimum sample size is to be at least five individuals for each item and a minimum of 300 individuals is required for factor analysis (Tabachnick et al., 2007). For the present study, a minimum of 300 participants were aimed to test construct validity with confirmatory factor analysis (CFA), and 418 individuals were reached with the snowball sampling method. Snowball sampling is a random sampling method where research participants recruit other participants for a study. In the first stage, teachers, who were determined as the main resource contacts, were contacted through social media platforms. They forwarded the items to the other teachers and parents they knew and therefore the actual study group was formed though the parents recruited by the main resource contacts. Finally, those who met the inclusion criteria and consented to participate were included in the study. The inclusion criteria were determined as having children between the ages of 6-18 and volunteering to participate in the study. Families with children between the ages of 6-18 were reached with a form prepared online and they were informed about the study. After obtaining informed consent from parents who volunteered to participate in the study in electronic medium, the data were collected with online scales.

## Instruments

The sociodemographic data form was prepared by the researchers and included questions related to sociodemographic characteristics of the child and his/her family (e.g., the child's age, gender, educational status; parents' age, educational status, family monthly income, family structure).

Sluggish Cognitive Tempo Scale is a 4-Likert type scale consisting of 14 items. Each item is scored as *totally disagree* (0), *somewhat agree* (1), *agree* (2), or *totally agree* (3). Total score of the scale is obtained by adding up the scores taken from all items. There is a parent and a teacher form. The original study was conducted on a sample consisting of school children in Canada. The parent form consists of three sub-dimensions (Slow, Sleepy and Daydreamer) explaining 70.2% of total variance. Internal consistency coefficient of the parent form ranges between 0.93 and 0.96 and test-retest reliability was found to be sufficient (ranging from 0.70 to 0.87) (Penny et al., 2009).

Strengths and Difficulties Questionnaire (SDQ), which was developed by Goodman to measure psychological problems in children and adolescents, includes 3-Likert

type scoring (Goodman, 1997). SDQ consists of five sub-dimensions as inattention and hyperactivity, conduct problems, emotional problems, peer problems and prosocial behaviours. Each sub-dimension has five questions. Turkish validity and reliability study was conducted by Güvenir et al. (2008). Cronbach's alpha value of the SDQ parent form used in our study was reported as .84 (Güvenir et al., 2008).

### *Translation of the Scale and Ethical Considerations*

Permission was granted by the author of the SCT questionnaire and Ethics Committee approval was sought from İstanbul Medeniyet University Göztepe Training and Research Hospital Ethics Committee. In the first stage, language validity of the scale was evaluated and first the original Questionnaire was translated into Turkish from English by a linguist and a professional translator independent from each other. The forms obtained were evaluated by the research team and the first draft form was created. This form was translated back into English by a different professional translator. The back translated form was compared with the original form by an independent researcher whose mother tongue was English and evaluated in terms of integrity of meaning and the scale was finalized in line with the presented recommendations.

In the second stage, the Questionnaire was evaluated in terms of content validity. One of the most common techniques used to evaluate content validity is Lawshe technique (Lawshe, 1975). At this stage, expert opinions were taken from 10 individuals who were experts in the fields of "Child Psychiatry," "English language" and "Assessment and Evaluation" and the items' content validity rates and the scale's content validity index were calculated. The final form of the Questionnaire was given to 30 parents, comprehensibility of the scales was evaluated and no problems were reported by the parents about the fluency and comprehensibility of the items.

### *Data Assessment*

The data obtained were analysed statistically with SPSS 24.0 (Statistical Package of Social Science) program and AMOS 22 program. First descriptive statistics (number, percentage, average, standard deviation) were analysed. Content validity of the scale was evaluated by using content validity index. In reliability analysis, Cronbach's Alpha coefficient was used for scale internal consistency and test-retest reliability was used to measure the test consistency over time. Pearson correlation coefficient was used for item-total correlation and Confirmatory Factor Analysis (CFA) was used for validity analysis. As a result of CFA, original scale model fit was evaluated with model fit indices ( $X^2/df$ , GFI, AGFI,

CFI, RMSEA, SRMR). Whether the measurement variables were normally distributed was tested with Kolmogorov-Smirnov analysis method. t-test was used in the comparison of independent group averages. The level of statistical significance was accepted as ( $p$ )<0,05.

## **Results**

### *Participants' characteristics*

Parents of 418 children and adolescents whose ages ranged between 6 and 18 ( $9.83 \pm 2.8$ ) participated in the study. While 50.6% ( $n = 211$ ) of the children and adolescents evaluated in the study were male, 49.4% ( $n = 207$ ) were female. Parents' ages ranged between 25 and 56 ( $37.30 \pm 5.8$ ). Educational status and some of the other characteristics of the parents are as shown in Table 1.

### *Content and Construct Validity*

Content validity of the questionnaire was evaluated by using content validity index. Total content validity index obtained based on the views of 10 experts was 0.90. Content validity rates of items ranged between 0.80 and 1.00. These values were over 0.75, which is the minimum value reported in literature (Wilson et al., 2012). Since the Turkish equivalents of the expressions "sluggish" and "drowsy" do not fully provide conceptual equivalence, their Turkish equivalents and cultural equivalents were discussed and the questionnaire was finalized. As a result, the questionnaire was found to have a high content validity. The questionnaire was tested on 30 parents with pilot application by using face to face interview technique. No negative result was reported as a result of the assessment on fluency and comprehensibility of the items. Construct validity of the questionnaire was tested by using confirmatory factor analysis. Standardized factor loads of the questionnaire were found to range between 0.62 and 0.81. Modification was recommended for improvement in CFA goodness of fit indices. In line with the recommendations, error variances between item 4 and item 14 were combined and fit indices were found to be in good levels. Fit index values were found as  $X^2 = 252.634$ ,  $DF = 73$ ,  $X^2/DF = 3.461$ ,  $GFI = .918$ ,  $CFI = .936$ ,  $RMSEA = .77$ ,  $SRMR = .060$  and CFA path diagram is shown in Figure 1.

### *Item Analyses, Internal Consistency and Test-Retest Reliability*

Item analysis was used to evaluate the quality and distinctiveness of the items in the questionnaire. According to the item analysis results, item-total correlation values were found to range between 0.507 and 0.662 (Table 2).

**Table 1.** Sociodemographic Characteristics of the Participants.

|                                  |  | Number<br>(n) | Percentage<br>(%) |
|----------------------------------|--|---------------|-------------------|
| Parents' educational status      | Primary                                | 52            | 12.4              |
|                                  | Secondary                              | 53            | 12.6              |
|                                  | High School                            | 101           | 24.1              |
|                                  | Undergraduate                          | 169           | 40.3              |
|                                  | Graduate                               | 44            | 10.5              |
| Average family income            | 0-2250 TL (0-305 \$)                   | 103           | 24.6              |
|                                  | 2250-4500 TL (305-615 \$)              | 121           | 28.9              |
|                                  | 4500-7000 TL (615-955\$):              | 73            | 17.4              |
|                                  | 7000 TL and higher (955\$ and higher): | 122           | 29.1              |
| Number of children in the family | 1                                      | 99            | 23.6              |
|                                  | 2                                      | 232           | 55.5              |
|                                  | 3                                      | 65            | 15.5              |
|                                  | 4 and more                             | 22            | 5.4               |
| Family type                      | Parents together                       | 380           | 90.7              |
|                                  | Divorced                               | 28            | 6.7               |
|                                  | Other                                  | 10            | 2.3               |

Note. N: 418.

Correlation matrix with all variables was demonstrated in Table 3. Internal consistency of the questionnaire was tested by using Cronbach's Alpha value. Cronbach's Alpha values of the total scale and sub-dimensions are as shown in Table 2. In order to evaluate the test-retest reliability, the questionnaire was applied twice with an interval of two weeks to 30 parents between the ages of 25-35. There was no statistically significant difference between the total scores obtained from the first and second applications ( $t = 0.651$ ;  $p = .596$ ). In addition, positive, multi directional and significant association was found between the total scores obtained ( $r = 0.949$ ;  $p < .001$ ).

### Evaluation of Average Scores, Group Differences of SCT and Its Association with SDQ

Table 4 shows the scores obtained by the participants from the total and sub-dimensions of SCT scale. The differences between the total and sub-dimensions of SCT scale in terms of the variables of gender, income and educational level were evaluated. While significant difference was found between total scale and Slow sub-dimension scores in terms of the variable of gender, no significant difference was found in terms of income and level of education. The values related with difference test are as shown in Table 5. The association between age and SCT scale score was examined and it was found that SCT score averages increased as age increased ( $r = .169$ ,  $p = .001$ ). Considering 2 or 3 points from an item in the scale as the presence of a SCT symptom, differences between genders were examined in terms of the

number of symptoms and average number of symptoms was found as 1.06 in female participants and as 1.45 in male participants ( $p = .001$ ). In addition, criterion validity of scale total and sub-dimensions was evaluated based on their association with SDQ. Each sub-dimension was found to be significantly associated with SDQ. The data related with correlation are shown in Table 6. The correlation between SDQ and SCT scales continued to be significant even when the SDQ inattention/hyperactivity symptoms were controlled (Table 7).

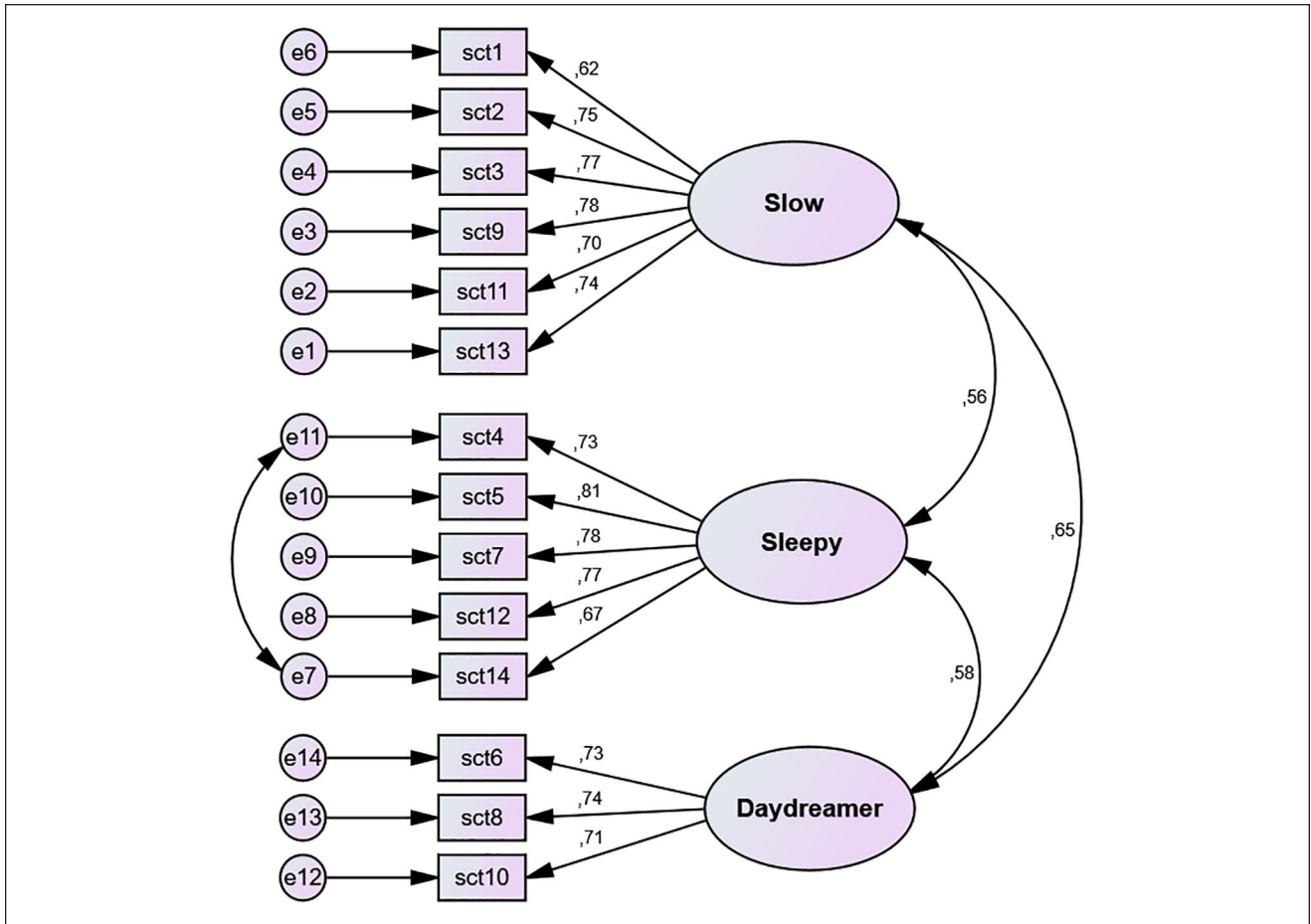
### Discussion

The aim of this study was to examine the psychometric characteristics of SCT scale-parent form developed by Penny et al. (2009) in a community sample consisting of Turkish children and adolescents between the ages of 6 to 18 (Penny et al., 2009). Findings of this study are the first data obtained from a Turkish community sample analysing the SCT profile of children and adolescents.

Internal consistency of the SCT scale was evaluated by using Cronbach's Alpha reliability coefficient. In the original study, reliability coefficients of the SCT scale-parent form total and Slow, Sleepy and Daydreamer sub-dimensions were found as 0.92, 0.89, 0.87, and 0.86, respectively. On the other hand, the Cronbach alpha values of the Barkley Child Attention Scale's total scale and Sluggishness and Daydreamy subscales were 0.86, 0.80 and 0.83, respectively (Firat et al., 2018). In our present study, the reliability coefficients of SCT scale-parent form Turkish version ( $\alpha = .90$ ) and sub-dimensions (Slow  $\alpha = .87$ , Sleepy  $\alpha = .86$ , Daydreamer  $\alpha = .77$ ) were similar to the original form and internal consistency was sufficient (Penny et al., 2009; Tabachnick et al., 2007).

Item analysis was conducted to measure the quality and discrimination of scale items and corrected item-total correlation values in the present study ranged between 0.51 and 0.66. These results show that all the items in the scale are homogeneous and they are statistically significantly correlated with the total scale (DeVellis, 2016). In the original form of the scale, item total correlation values were between 0.55 and 0.80 and the results in the present study are very close to these values. Test-retest reliability was evaluated with 2 applications with an interval of 2 weeks and the obtained SCT total scores were found to be highly correlated ( $r = .949$ ;  $p < .001$ ). In the original study, test-retest total scores correlation coefficient was found as 0.87 (Penny et al., 2009).

Construct validity of the adapted scale was examined with confirmatory factor analysis. As a result of the confirmatory factor analysis performed in line with the structure in the original form, modification was recommended for fit indices to become acceptable (Koyuncu & Kılıç, 2019). In



**Figure 1.** Confirmatory factor analysis path diagram for three factor model and standardized factor loadings of Turkish version.

**Table 2.** Corrected Item-Total Correlation Coefficients and Cronbach’s Alpha Value for Turkish Version.

| Sub-dimension                  | Item    | $M \pm SD$ | Corrected item-total Correlation | Item sub-dimension correlation | Cronbach’s alpha if item deleted ( $\alpha$ ) |
|--------------------------------|---------|------------|----------------------------------|--------------------------------|---|
| Slow<br>( $\alpha$ :.87)       | Item 1  | .50 ± .651 | .569                             | .572                           | .864  |
|                                | Item 2  | .69 ± .766 | .662                             | .686                           | .846  |
|                                | Item 3  | .74 ± .832 | .659                             | .718                           | .840  |
|                                | Item 9  | .67 ± .803 | .658                             | .727                           | .838  |
|                                | Item 11 | .59 ± .741 | .631                             | .650                           | .852  |
|                                | Item 13 | .87 ± .857 | .659                             | .674                           | .848  |
| Sleepy<br>( $\alpha$ :.86)     | Item 4  | .37 ± .645 | .641                             | .709                           | .826  |
|                                | Item 5  | .20 ± .485 | .558                             | .730                           | .821  |
|                                | Item 7  | .20 ± .459 | .526                             | .703                           | .829  |
|                                | Item 12 | .18 ± .456 | .547                             | .658                           | .838  |
|                                | Item 14 | .34 ± .658 | .605                             | .663                           | .841  |
| Daydreamer<br>( $\alpha$ :.77) | Item 6  | .44 ± .698 | .507                             | .624                           | .651  |
|                                | Item 8  | .37 ± .621 | .528                             | .624                           | .662  |
|                                | Item 10 | .51 ± .756 | .595                             | .554                           | .741  |

Note. Scale Cronbach’s alpha: .90

line with modification recommendations, after error variances of item 4 and item 14 in Sleepy sub-dimension were

combined, fit indices were found to reach good levels (Comrey & Lee, 2013). In addition, standardized factor

**Table 3.** Correlation matrix with all items.

|       | Sct1 | Sct2  | Sct3  | Sct4  | Sct5  | Sct6  | Sct7  | Sct8  | Sct9  | Sct10 | Sct11 | Sct12 | Sct13 | Sct14 |
|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Sct1  | r    |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Sct2  | r    | 0.430 |       |       |       |       |       |       |       |       |       |       |       |       |
| Sct3  | r    | 0.531 | 0.631 |       |       |       |       |       |       |       |       |       |       |       |
| Sct4  | r    | 0.401 | 0.497 | 0.435 |       |       |       |       |       |       |       |       |       |       |
| Sct5  | r    | 0.295 | 0.298 | 0.300 | 0.603 |       |       |       |       |       |       |       |       |       |
| Sct6  | r    | 0.212 | 0.319 | 0.313 | 0.278 | 0.320 |       |       |       |       |       |       |       |       |
| Sct7  | r    | 0.295 | 0.294 | 0.323 | 0.547 | 0.624 | 0.270 |       |       |       |       |       |       |       |
| Sct8  | r    | 0.280 | 0.286 | 0.310 | 0.313 | 0.311 | 0.592 | 0.328 |       |       |       |       |       |       |
| Sct9  | r    | 0.479 | 0.581 | 0.601 | 0.379 | 0.299 | 0.322 | 0.231 | 0.265 |       |       |       |       |       |
| Sct10 | r    | 0.363 | 0.401 | 0.333 | 0.376 | 0.369 | 0.496 | 0.286 | 0.492 | 0.478 |       |       |       |       |
| Sct11 | r    | 0.462 | 0.497 | 0.511 | 0.353 | 0.271 | 0.324 | 0.265 | 0.357 | 0.551 | 0.405 |       |       |       |
| Sct12 | r    | 0.330 | 0.279 | 0.254 | 0.518 | 0.634 | 0.336 | 0.635 | 0.388 | 0.254 | 0.344 | 0.371 |       |       |
| Sct13 | r    | 0.405 | 0.543 | 0.536 | 0.385 | 0.277 | 0.415 | 0.250 | 0.421 | 0.610 | 0.438 | 0.551 | 0.269 |       |
| Sct14 | r    | 0.368 | 0.448 | 0.428 | 0.636 | 0.547 | 0.240 | 0.538 | 0.283 | 0.364 | 0.357 | 0.383 | 0.451 | 0.367 |

$p < 0.001$ .

**Table 4.** Participants' Scores from SCT Scale and Sub-dimensions.

|            | Min-Max | Mean | SD   |
|------------|---------|------|------|
| Item1      | 0-3     | .50  | .65  |
| Item2      | 0-3     | .69  | .76  |
| Item3      | 0-3     | .74  | .83  |
| Item9      | 0-3     | .67  | .80  |
| Item11     | 0-3     | .59  | .74  |
| Item13     | 0-3     | .87  | .85  |
| Slow       | 0-17    | 4.06 | 3.64 |
| Item4      | 0-3     | .37  | .64  |
| Item5      | 0-3     | .20  | .48  |
| Item7      | 0-3     | .20  | .45  |
| Item12     | 0-3     | .18  | .45  |
| Item14     | 0-3     | .34  | .65  |
| Sleepy     | 0-12    | 1.28 | 2.20 |
| Item6      | 0-3     | .44  | .69  |
| Item8      | 0-3     | .37  | .62  |
| Item10     | 0-3     | .51  | .75  |
| Daydreamer | 0-8     | 1.31 | 1.72 |
| SCT Total  | 0-28    | 6.65 | 6.32 |

Note. SCT: Sluggish Cognitive Tempo.

loads of scale items (0.62–0.81) were found to be higher than the minimum value specified in literature ( $\geq .20$ ) (Streiner et al., 2015). In the present study, it was found that the psychometric characteristics of the scale were good and similar to the original form, the construct of the Turkish version of the scale consisting of three sub-dimensions as Slow, Sleepy and Daydreamer was supported similar to the original form. The Barkley Child Attention Scale has a 2-factor structure, namely Sluggishness and Daydreaming (Firat et al., 2018). Since information about the scale items

included in the sub-dimensions was not included in the article, we cannot provide an evaluation of the reason for the structural difference between the scale used by Firat et al. (2018) and the SCT scale-parent form Turkish version used in this study. In the present study, criterion validity was shown with the presence of significant correlation between SDQ total score and sub-dimension scores and total score and scores of the three sub-dimensions of SCT scale-Turkish form. Significant correlation was found between SCT total and sub-dimension scores and SDQ-Inattention and Hyperactivity and SDQ-emotional problems sub-dimensions. This result is in parallel with the results of studies indicating that in addition to being associated with ADHD, SCT is also associated with internalized disorders (Becker et al., 2014, 2016).

When the effect of sociodemographic variables on SCT scores was examined, significant difference was found in SCT total score and SCT-Slow sub-dimension score in favour of male gender. Although no difference has been reported between genders in terms of SCT scores in two studies evaluating children and adolescents (Carlson & Mann, 2002; Marshall et al., 2014), significant difference was found in two studies in favour of female gender (Barkley, 2013; Ludwig et al., 2009) and in one study in favor of male gender (Becker et al., 2014). The results of the present study are similar to the results of the study conducted by Becker et al. (2014). Since the study which reported the percentage of male gender higher in SCT scores did not have a design that eliminated the effect of ADHD, it was stated that this difference may be related with ADHD and thus should be interpreted carefully in terms of SCT (Becker et al., 2014). In a meta-analysis where Becker et al. (2016) evaluated 73 SCT-related studies, they concluded that dimensional SCT symptoms only

**Table 5.** Comparison of SCT Total and Sub-dimension Scores in Terms of Sociodemographic Variables.

|                    | n (%)     | SCT Scale             |                      |                     |                       |
|--------------------|-----------|-----------------------|----------------------|---------------------|-----------------------|
|                    |           | Slow                  | Sleepy               | Daydreamer          | Total                 |
|                    |           | Mean ± SD             | Mean ± SD            | Mean ± SD           | Mean ± SD             |
| Gender             |           |                       |                      |                     |                       |
| Male               | 211(50.5) | 4.42±3.70             | 1.46±2.30            | 1.37±1.80           | 7.26±6.48             |
| Female             | 207(49.5) | 3.69±3.54             | 1.11±2.08            | 1.25±1.62           | 6.04±6.10             |
|                    |           | t: -2.077<br>p: .038* | t: -1.694<br>p: .100 | t: -.762<br>p: .446 | t: -1.976<br>p: .049* |
| Educational Status |           |                       |                      |                     |                       |
| Primary            | 51(12.2)  | 3.53±3.24             | .88±1.41             | 1.35±1.57           | 5.76±5.24             |
| Secondary          | 53(12.6)  | 4.21±4.30             | 1.83±2.64            | 1.04±1.60           | 7.08±7.65             |
| High School        | 101(24.1) | 3.86±3.75             | 1.30±2.43            | 1.38±2.00           | 6.53±6.83             |
| Undergraduate      | 170(40.6) | 4.39±3.58             | 1.31±2.09            | 1.39±1.70           | 7.08±6.02             |
| Graduate           | 43(10.2)  | 3.65±3.15             | .98±2.13             | 1.14±1.36           | 5.77±5.61             |
|                    |           | f: .725<br>p: .575    | f: .849<br>p: .495   | f: 1.470<br>p: .211 | f: .571<br>p: .684    |
| Level of income    |           |                       |                      |                     |                       |
| 0-2250 TL          | 103(24.6) | 3.66±3.61             | 1.22±2.12            | 1.26±1.79           | 6.14±6.33             |
| 2250-4500 TL       | 121(28.9) | 4.24±3.89             | 1.36±2.29            | 1.40±1.83           | 7.00±6.81             |
| 4500-7000 TL       | 73(17.4)  | 4.27±3.59             | 1.38±2.20            | 1.26±1.67           | 6.92±6.34             |
| 7000 TL and higher | 122(29.1) | 4.08±3.44             | 1.21±2.18            | 1.29±1.58           | 6.58±5.82             |
|                    |           | f: .600<br>p: .615    | f: .167<br>p: .919   | f: .174<br>p: .914  | f: .394<br>p: .757    |

\**p* < .05.**Table 6.** Association Between SCT Scores and SDQ Total and Sub-dimension Scores.

| Variables                         | Test     | Slow  | Sleepy | Daydreamer | Sct Total |
|-----------------------------------|----------|-------|--------|------------|-----------|
| SDQ Emotional problems            | <i>r</i> | .408  | .378   | .420       | .480      |
|                                   | <i>p</i> | <.001 | <.001  | <.001      | <.001     |
| SDQ Conduct problems              | <i>r</i> | .480  | .239   | .379       | .462      |
|                                   | <i>p</i> | <.001 | <.001  | <.001      | <.001     |
| SDQ Inattention and hyperactivity | <i>r</i> | .634  | .235   | .428       | .563      |
|                                   | <i>p</i> | <.001 | <.001  | <.001      | <.001     |
| SDQ Peer problems                 | <i>r</i> | .310  | .313   | .247       | .354      |
|                                   | <i>p</i> | <.001 | <.001  | <.001      | <.001     |
| SDQ Prosocial behaviours          | <i>r</i> | -.278 | -.249  | -.182      | -.296     |
|                                   | <i>p</i> | <.001 | <.001  | <.001      | <.001     |
| SDQ Total                         | <i>r</i> | .650  | .395   | .515       | .651      |
|                                   | <i>p</i> | <.001 | <.001  | <.001      | <.001     |

SDQ: Strengths and Difficulties Questionnaire.

had a modest association with male sex, however females were more likely to have high levels of SCT symptoms. In our study, children and adolescents who got 2 or 3 points from any SCT item were considered to have SCT symptom, and average number of symptoms was found as 1.06 in females and as 1.45 in males. Although male gender had more symptoms, this difference was not found to be statistically significant. While our finding that girls had more SCT symptoms was not fully in line with the literature, it is in

parallel with the dimensional difference favouring boys. It would be plausible to attribute this difference between results of studies to different measurement instruments used in the evaluation of SCT symptoms and to methodological differences. Further studies with larger sample with reliable and valid measurement instruments are needed.

In a meta-analysis conducted in 2016, a small but significant positive correlation was found between age and SCT (Becker et al., 2016). While a large number of studies did

**Table 7.** Association Between SCT Scores and SDQ Total and Sub-dimension Scores when ADHD symptoms controlled.

| Variables                | Test     | Slow  | Sleepy | Daydreamer | Sct Total |
|--------------------------|----------|-------|--------|------------|-----------|
| SDQ Emotional problems   | <i>r</i> | .195  | .315   | .289       | .319      |
|                          | <i>p</i> | <.001 | <.001  | <.001      | <.001     |
| SDQ Conduct problems     | <i>r</i> | .212  | .137   | .194       | .228      |
|                          | <i>p</i> | <.001 | <.001  | <.001      | <.001     |
| SDQ Peer problems        | <i>r</i> | .217  | .273   | .168       | .278      |
|                          | <i>p</i> | <.001 | <.001  | <.001      | <.001     |
| SDQ Prosocial behaviours | <i>r</i> | -.144 | -.199  | -.077      | -.182     |
|                          | <i>p</i> | <.001 | <.001  | <.117      | <.001     |
| SDQ Total                | <i>r</i> | .293  | .363   | .316       | .400      |
|                          | <i>p</i> | <.001 | <.001  | <.001      | <.001     |

not find a significant association between SCT symptoms and age (Carlson & Mann, 2002; Ludwig et al., 2009; Marshall et al., 2014), Barkley showed in a community sample that there was a significant increase in SCT symptoms with age in both children and adolescents and adults (Barkley, 2012, 2013). These findings were supported by another study (Leopold et al., 2016). In our study, positive correlation was found between age and SCT symptoms ( $r = .169, p = 0,001$ ). Although there are few studies in literature evaluating the association between socioeconomic level and SCT, the results of the meta-analysis conducted in 2016 showed that in children SCT was associated with low income level and low parental educational status (Becker et al., 2016). In our study, parents' educational status and income level was not found to have a significant effect on SCT total score and sub-dimension scores. In the present study, 40.3% of the parents are university graduates and it is thought that this may have increased socioeconomic level and influenced analysis results.

The strengths of the present study are the adaptation of a scale that will contribute to dimensional evaluation of SCT into Turkish and presentation of the first data obtained from community sample related with the SCT profiles of Turkish children and adolescents. On the other hand, the study also has some limitations including; the fact that no face-to-face interviews were made with the children included in the study, that children who have possible ADHD and other psychiatric diagnoses within the sample were not determined and that information was taken only from the parents are the limitations of the present study.

In studies evaluating Penny SCT scale items, it has been shown that some items in the Slow subscale overlap with the ADHD-Inattention sub-dimension, and these items are not distinctive for SCT (Jacobson et al., 2012). Since this study was a scale validity and reliability study, all items in the original scale were included in the study and the first data on cultural validity were presented in this form. Although not conducted in the present study, in order to separate SCT Slow items from ADHD inattention, different methodological approaches could be followed to clarify this issue.

As a conclusion, this study shows that SCT scale developed by Penny et al. (2009) is a valid and reliable measurement instrument that can be used in the evaluation of SCT symptoms in 6 to 18-year old Turkish children and adolescents. In addition, the study presents the first data related with SCT profiles of children and adolescents in Turkey. It is thought that these data will contribute to literature about the cultural validity of SCT.

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