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Towards Establishing the Transcultural Validity of Sluggish Cognitive Tempo: Evidence from a Sample of South Korean Children

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Abstract

Objective.—All sluggish cognitive tempo (SCT) research has been conducted in North America and Western Europe, with the addition of one study in Chile. Our objective was to determine the internal and external validity of nine SCT and nine *DSM-5* ADHD inattention (ADHD-IN) symptoms in South Korean children.

Method.—Mothers, fathers, and teachers rated SCT, ADHD-IN, ADHD hyperactivity/impulsivity (HI), oppositional defiant disorder (ODD), anxiety, depression, academic impairment, and social impairment in 1st-6th-grade children (ages 6–13 years) from South Korea (Sample 1: mothers rated 885 children and fathers rated 646 children; 941 unique children, 54% girls; Sample 2: 99 teachers rated 297 children, 44% girls).

Results.—The SCT and ADHD-IN symptoms showed convergent validity (substantial loadings on their respective factors) and discriminant validity (loadings near zero on the alternative factor) across all three raters. While ADHD-IN showed a positive relationship with ADHD-HI and ODD even after controlling for SCT across all three raters, SCT was non-significantly (mothers and fathers) or negatively (teachers) related to ADHD-HI and ODD after controlling for ADHD-IN. Higher SCT scores predicted higher anxiety, depression, academic impairment (teachers only) and social impairment (teachers only) even after controlling for ADHD-IN while higher ADHD-IN scores predicted higher anxiety (mothers and fathers only), depression, academic impairment, and social impairment after controlling for SCT.

Conclusions.—The study provides initial evidence for the internal and external validity of SCT relative to ADHD-IN in South Korean children, thereby providing the first evidence for SCT's validity in Asian children.

Keywords

sluggish cognitive tempo; ADHD; attention deficit disorder; impairment; South Korea

Sluggish cognitive tempo (SCT) is characterized by inconsistent alertness, slow thinking/slow behavior, drowsiness, and lack of energy. Studies increasingly support SCT's internal and external validity (Barkley, 2013; Becker, 2014; Becker, Luebke, & Joyce, 2015; Bernad et al., 2014, 2015; Lee, Burns, Snell, & McBurnett, 2014; McBurnett et al., 2014; Penny et al., 2009; Willcutt et al., 2014). That is, SCT is distinct from ADHD-IN and also associated with unique correlates. However, research on SCT's validity is currently limited to studies in North America (primarily the United States) or Western Europe (primarily Spain), with the exception of one study from Chile (Belmar, Servera, Becker, & Burns, 2015). Given that culture influences children's mental health (Achenbach & Rescorla, 2007), it is important to determine SCT's validity across cultures.

It is unknown if SCT will show the same pattern of internal and external validity for children from Asia. As compared to independence and individualism often prioritized in North America and Europe, Korean culture is rooted in Confucianism and places more value on collectivist qualities such as harmony, filial piety, and balancing competition with group conformity (Cha, 1994). These cultural characteristics may have implications for SCT. For instance, even if SCT symptoms are observed among Korean children, they may not be viewed as problematic since they are not disruptive in nature and thus unlikely to conflict with cultural norms and expectations. Likewise, SCT may not evince the same associations with impairment in Asian children as found in studies with American and European children. In particular, SCT has been consistently associated with social impairment, an association that is hypothesized to be due to social withdrawal and shyness specifically (Becker et al., 2013; Willcutt et al., 2014). Whereas shyness and inhibition are associated with peer problems in American and European children, the same is not always true in Asian children (Rubin, 1998). In one study of Korean children specifically, teacher-rated withdrawn behaviors were unassociated with peer difficulties (Shin, 2007), and a retrospective study found that Koreans who displayed shy-withdrawn behaviors in adolescence showed better adjustment in young adulthood than shy-withdrawn adolescents from Australia (Kim, Rapee, Ja Oh, & Moon, 2008). Since shyness/withdrawal appears a primary contributor to social impairment associated with SCT, SCT may not be as strongly associated with social impairment in Korean children. As SCT research advances, it is critical to determine if findings from North American and European samples generalize to other cultures.

In sum, our purpose was to evaluate the internal and external validity of SCT with ratings by mothers, fathers, and teachers of children from Korea. Although the validity of ADHD scales are well established with Korean children (Jang, Suh, & Byun, 2007; Seo et al., 2008), no study has examined SCT's validity in Korea. For this study, we used an SCT rating scale with strong internal and external validity for children from the United States (Lee et al., 2014) and Chile (Belmar et al., 2015). However, a comparison of this scale with other SCT scales indicated the absence of one commonly used SCT symptom ("lacks

energy”), and so an item reflecting this symptom was added to the measure. Table 1 shows the SCT symptoms.

Objectives

The first objective was to determine if SCT and ADHD-IN symptoms have internal validity relative to each other (i.e., each symptom set was expected to show high loadings on their respective factors and low loadings on the other factor). The second objective was to evaluate the fit of an SCT, ADHD-IN, ADHD hyperactivity/impulsivity (HI), oppositional defiant disorder (ODD), anxiety, depression, academic impairment, and social impairment 8-factor confirmatory factor analytic (CFA) model. This model was expected to yield a good fit. The SCT factor was also expected to show a weaker correlation than the ADHD-IN factor with the ADHD-HI and ODD factors with SCT and ADHD-IN factors being approximately equally correlated with the other factors.

The third objective addressed two external validity questions. The first analysis determined SCT’s and ADHD-IN’s unique ability to predict ADHD-HI, ODD, anxiety, depression, academic impairment, and social impairment factors. Higher levels of SCT were expected to predict *lower* levels of ADHD-HI and ODD after controlling for ADHD-IN (or SCT’s positive first-order correlation with ADHD-HI and ODD would become non-significant) while higher levels of ADHD-IN would still predict *higher* levels ADHD-HI and ODD after controlling for SCT. Higher levels of SCT were also expected to predict higher levels of anxiety, depression, and academic impairment scores even after controlling for ADHD-IN, with the hypothesized unique association with social impairment less clear given cultural considerations described above. The second analysis determined the unique external correlates of SCT after controlling anxiety, depression, and ADHD-IN. SCT was expected to show the same unique relationships with externalizing and impairment dimensions even after controlling for anxiety, depression, and ADHD-IN.

Method

Participants and Procedures

Teacher sample.—With approval of the schools and university IRB, 100 teachers from four schools (grades first through sixth) in Gyeongsan (population approximately 256,470) were invited to participate. These four schools represented a sample of convenience. Participation was voluntary (99 of 100 teachers) and anonymous, with teachers compensated ten dollars. Each teacher rated three students randomly selected by the researchers. The 297 students (43.8% girls) were ages 6 to 13 years ($M=10.11$, $SD=1.89$). Most of the children were Korean (<1% of the children were from multinational families), and 16–24% of children received free meals. Ethnicity and free meal information were not available for individual children.

Parent sample.—With IRB and school approval, teachers gave the 1,000 children in the four schools an envelope with the materials to give to parents. Participation was voluntary and anonymous. A total of 885 mothers and 646 fathers returned the scales (941 unique children, $M_{age}=9.58$, $SD=1.75$, range = 6 to 13, 53.5% girls).

Measure

Parents and teachers completed the *Child and Adolescent Disruptive Behavior Inventory* (CADBI) (Burns et al., 2014). The scale measures SCT (9 items), ADHD-IN (9 items), ADHD-HI (9 items), ODD toward adults (8 items; e.g., argues with adults), ODD toward peers (8 items; e.g., argues with peers), anxiety (6 items), depression (6 items), academic impairment (four items: *completion of homework, reading skills, arithmetic skills, and writing skills*), and social impairment (four items assessing quality of interactions with parents [teacher], adults other than parents [other adults at school], brothers and sisters [peers in the classroom], and other children in the home and community [peers outside of the classroom at school]).

The symptoms were rated on a 6-point scale (from *almost never* [*never or about once per month*] to *almost always* [*many times per day*]). A 7-point scale was used for the academic and social impairment items (*severe difficulty* to *excellent performance* [*excellent interactions*] for grade level). The impairment items were reversed keyed so higher scores represent greater impairment. Mothers and fathers were instructed to rate the child's behavior at home and in the community (not school) and make their ratings independently. Teachers were instructed to rate the child's behavior at school. The teachers had been interacting with the students for 8 months.

Table 1 shows the SCT, anxiety, and depression symptoms. ADHD and ODD symptoms were based on *DSM-5* descriptions. The two ODD scales were combined into a single ODD scale. Earlier studies support the reliability and validity of CADBI scores (Belmar et al., 2015; Bernad et al., 2015; Lee et al., 2014). Individuals with advanced degrees in child-clinical psychology with previous experience in the translation of parent and teacher rating scales from English to Korean translated and back-translated the CADBI. In addition, given the importance of a meaningful translation of SCT symptoms, teachers and parents not in the study were asked to rate the clarity of the SCT symptoms (i.e., *very confusing, I do not understand, quite confusing, somewhat confusing, clear, very clear, and perfectly clear*). SCT symptoms were rated at least "clear" and only a few changes were made to improve clarity.

Analytic Strategy

Item ratings were treated as ordered-categories with the exception of the ODD item ratings that were treated as continuous (combination of the two sets of ODD items created too many categories to treat the ODD items as ordered-categories). Analyses used the robust weighted least squares (WLSMV) estimator (Mplus v.7.3). There was little missing information (covariance coverage was approximately 99%). The analyses took into account that children were nested within teachers.

A two-factor model was first applied to nine SCT and nine ADHD-IN symptoms to determine the convergent and discriminant validity of SCT and ADHD-IN symptoms for the three sources (i.e., analysis restricted to two factors with cross-loadings allowed). SCT symptoms had to show convergent and discriminant validity to be used in subsequent analyses. The second set of analyses used CFA to evaluate the fit of the SCT, ADHD-IN,

ADHD-HI, ODD, anxiety, depression, academic impairment, and social impairment eight-factor model for the three sources. The third set of analyses used structural regression analysis to determine the ability of SCT and ADHD-IN to uniquely predict ADHD-HI, ODD, anxiety, depression, academic impairment, and social impairment. Finally, the fourth set of analyses used structural regression analysis to determine ability of SCT to predict ADHD-HI, ODD, academic impairment, and social impairment while controlling for anxiety, depression, and ADHD-IN.

Results

Convergent and Discriminant Validity of SCT and ADHD-IN Symptoms

Teachers.—All nine SCT symptoms showed convergent validity (loadings from 0.69 to 1.03 on SCT factor, $M = .89$, $SD = .12$) and discriminant validity (loadings from -0.28 to 0.26 on ADHD-IN factor, $M = .02$, $SD = .17$). Given the oblique solution and cross-loadings, loadings could be larger than 1.00. The nine ADHD-IN symptoms also showed convergent validity (loadings from 0.91 to 0.99 on ADHD-IN, $M = .94$, $SD = .04$) and discriminant validity (loadings from -0.07 to 0.08 on SCT, $M = .01$, $SD = .05$).

Mothers.—All nine SCT symptoms showed convergent validity (loadings from 0.66 to 0.89 on SCT, $M = .81$, $SD = .07$) and discriminant validity (loadings from -0.08 to 0.07 on ADHD-IN, $M = .01$, $SD = .05$). In addition, all nine ADHD-IN symptoms showed convergent validity (loadings from 0.71 to 0.88 on ADHD-IN, $M = .81$, $SD = .06$) and discriminant validity (loadings from -0.04 to 0.11 on SCT, $M = .03$, $SD = .07$).

Fathers.—All nine SCT symptoms showed convergent validity (loadings from 0.66 to 0.95 on SCT factor, $M = .80$, $SD = .10$) and discriminant validity (loadings from -0.09 to 0.19 on ADHD-IN, $M = .05$, $SD = .10$). All nine ADHD-IN symptoms also showed convergent validity (loadings from 0.75 to 0.89 on ADHD-IN, $M = .82$, $SD = .05$) and discriminant validity (loadings from -0.04 to 0.14 on SCT, $M = .04$, $SD = .06$).

Reliability

For teachers (mothers and fathers), reliability coefficients for SCT, ADHD-IN, ADHD-HI, ODD, anxiety, depression, academic impairment, and social impairment scales were .95 (.91, .91), .98 (.93, .94), .97 (.90, .92), .98 (.95, .95), .87 (.77, .81), .92 (.79, .81), .96 (.90, .91), and .96 (.83, .85), respectively. The mother with father factor correlations for SCT, ADHD-IN, ADHD-HI, ODD, anxiety, depression, academic impairment, and social impairment were .73, .71, .68, .55, .76, .70, .74, and .68. Parent with teacher factor correlations were not available since the ratings were not linked.

Fit of Measurement Model

The SCT, ADHD-IN, ADHD-HI, ODD, anxiety, depression, academic impairment, and social impairment eight-factor model provided an excellent global fit for each source (teachers: $\chi^2 (1402) = 2200$, CFI = .980, TLI = .979, RMSEA = .044 (90% CI: .040, .047); mothers: $\chi^2 (1402) = 2662$, CFI = .970, TLI = .968, RMSEA = .032 (90% CI: .030, .034); fathers: $\chi^2 (1402) = 2397$, CFI = .971, TLI = .969, RMSEA = .033 (90% CI: .031, .035)).

Item-Factor Loadings

SCT items had substantial loadings on the SCT factor for teachers, mothers and fathers (.72-.97) with similar results for ADHD-IN (.73-.96), ADHD-HI (.71-.97), ODD (.60-.99), anxiety (.55-.90), depression (.72-.95), academic impairment (.78-.98), and social impairment (.79-.98).

SCT and ADHD-IN Symptoms in Relation to Age and Sex

The SCT factor was not significantly ($ps > .05$) related to children's age (teachers: $r = .03$, $SE = .06$; mothers: $r = .03$, $SE = .04$; fathers: $r = .03$, $SE = .05$) with the SCT factor also not being significantly ($ps > .05$) related to children's sex (boys coded 1) for mothers and fathers (mothers: $r = .07$, $SE = .04$ fathers: $r = .02$, $SE = .04$). For teachers, however, boys had significantly higher levels of SCT than girls ($r = .21$, $SE = .06$, $p = .001$). The ADHD-IN factor was not significantly ($ps > .05$) related to the children's age for teachers ($r = .01$, $SE = .06$) and fathers ($r = -.07$, $SE = .04$). For mothers, however, higher ADHD-IN scores were associated with younger ages ($r = -.12$, $SE = .04$, $p = .001$). Boys had significantly higher levels of ADHD-IN than girls for all three raters (teachers: $r = .38$, $SE = .05$, $p < .001$; mothers: $r = .16$, $SE = .03$, $p < .001$; fathers: $r = .09$, $SE = .04$, $p = .009$).

Independence of SCT and ADHD-IN Factors

The correlation of the SCT and ADHD-IN factors for teachers, mothers, and fathers were .74 ($SE = .04$), .75 ($SE = .02$), and .79 ($SE = .02$), respectively. The true score independent variance in each factor was 45%, 44%, and 38% for the three sources, respectively. These SCT and ADHD-IN factor correlations were also similar to the ADHD-IN and ADHD-HI factor correlations (.83 for teachers, .78 for mothers, and .83 for fathers).

Correlations of SCT and ADHD-IN with Symptom and Impairment Dimensions

Table 2 shows the factor correlations of SCT and ADHD-IN with ADHD-HI, ODD, anxiety, depression, academic impairment, and social impairment for teachers, mothers, and fathers. For all three sources, higher scores on SCT and ADHD-IN were associated with significantly ($ps < .001$) higher scores on ADHD-HI, ODD, anxiety, depression, academic impairment and social impairment. As predicted, ADHD-IN had significantly ($ps < .01$) higher correlations than SCT with ADHD-HI and ODD for teachers, mothers, and fathers ratings. For ratings by mothers and fathers, the correlations of SCT and ADHD-IN with anxiety and depression did not differ significantly ($ps > .05$) while for ratings by teachers SCT had a significantly ($ps < .01$) stronger correlation than ADHD-IN with anxiety and depression. For ratings by mothers, fathers, and teachers, ADHD-IN had a significantly ($ps < .01$) stronger correlation than SCT with academic impairment and social impairment.

Unique Effects of SCT and ADHD-IN on Symptom and Impairment Dimensions

Table 3 shows the standardized partial regression coefficients of SCT and ADHD-IN on ADHD-HI, ODD, anxiety, depression, academic impairment, and social impairment.

Teachers.—For teachers, higher levels of SCT predicted significantly ($ps < .001$) lower levels of ADHD-HI and ODD after controlling for ADHD-IN while higher levels ADHD-IN

predicted significantly ($ps < .001$) *higher* levels of ADHD-HI and ODD after controlling for SCT. Higher levels of SCT predicted significantly ($ps < .001$) higher levels of anxiety, depression, academic impairment, and social impairment even after controlling for the ADHD-IN while higher scores on ADHD-IN predicted significantly ($ps < .05$) higher scores on depression, academic impairment, and social impairment after controlling for SCT.

Mothers and fathers.—For mothers and fathers, SCT was no longer significantly related to ADHD-HI and ODD after controlling for ADHD-IN while higher levels of ADHD-IN continued to predict significantly ($ps < .001$) higher levels of ADHD-HI and ODD after controlling for SCT. For both mothers and fathers, SCT and ADHD-IN both uniquely predicted significantly higher levels of anxiety and depression. Finally, for both mothers and fathers, only ADHD-IN uniquely predicted significantly ($ps < .001$) higher levels of academic impairment and social impairment. There was a tendency ($p < .10$), however, for SCT to uniquely predict social impairment for mothers and academic impairment for fathers even after controlling for ADHD-IN (Table 3). In addition, none of these results changed when analyses were repeated also controlling for sex and age.

Unique Effects of SCT controlling for Anxiety, Depression, and ADHD-IN

For mothers and teachers, all the significant and non-significant unique effects of SCT and ADHD-IN remained the same even after also controlling for anxiety and depression. For fathers, there were two changes. Higher levels of SCT predicted significantly *lower* levels of ODD ($\beta = -.14$, $SE = .06$, $p = .03$) and significantly higher levels of academic impairment ($\beta = .22$, $SE = .07$, $p = .002$).

Discussion

An increasing number of studies support SCT's construct validity relative to ADHD-IN. With the exception one study in Chile (Belmar et al., 2015), all were conducted in North America and Western Europe. Given the absence of studies with children from Asian cultures, our study sought to determine if SCT would demonstrate internal and external validity with ratings by mothers, fathers, and teachers of Korean children, particularly given characteristics of Korean culture may influence presentation of SCT and associated impairments. Similar findings with Korean children to the findings with children from the United States, Western Europe, and Chile would increase our confidence in the transcultural generalizability of SCT's internal and external validity, and also take an important step in establishing SCT's cross-cultural validity. The absence of support for SCT's validity with Korean children would raise the possibility that it was at least partially a culturally bound syndrome, or that SCT symptoms in Korean children had a dissimilar presentation and impact on functioning as compared to SCT symptoms as observed in children from North America and Europe.

Internal Validity of the SCT and ADHD-IN Symptoms

All nine SCT symptoms showed excellent convergent validity (substantial loadings on the SCT factor) and excellent discriminant validity (substantially higher loadings on the SCT factor than the ADHD-IN factor). Importantly, the same results occurred with ratings by

mothers, fathers, and teachers. These findings replicated earlier results of children from the United States (Lee et al., 2014) and Chile (Belmar et al., 2015). This study extends these findings to mothers and teachers in Korea, includes ratings completed by fathers, and also includes a new “lacks energy” SCT symptom. Given the language and cultural differences across the United States, Chile, and Korea, the identification of a common set of SCT symptoms with internal validity relative to ADHD-IN symptoms seems closer. A common symptom set of SCT symptoms is critical to advance our understanding of SCT. The current study makes a significant contribution in being the first study to support SCT’s internal validity in Korean children.

Correlations of SCT and ADHD-IN with Symptom and Impairment Dimensions

Across mother, father, and teacher ratings, higher levels of SCT and ADHD-IN were associated with higher levels of ADHD-HI, ODD, anxiety, depression, academic impairment, and social impairment. Also, as predicted as well as consistent with earlier studies (Belmar et al., 2015; Bernad et al., 2014, 2015; Burns et al., 2013; McBurnett et al., 2014), SCT had a weaker relationship than ADHD-IN with externalizing behaviors of ADHD-HI and ODD. Although SCT and ADHD-IN correlations with symptom and impairment dimensions are important, their unique associations with the outcomes are more important to an examination of SCT’s external validity. We now turn to these findings.

Unique Effects of SCT and ADHD-IN on Symptom and Impairment Dimensions

Consistent with the findings from studies in North America and Western Europe (Bernad et al., 2014; Burns et al., 2013; Lee et al., 2014; McBurnett et al., 2014; Penny et al., 2009; Servera et al., 2015), when the overlap between SCT and ADHD-IN was taken into account, SCT no longer showed a positive relationship with externalizing behaviors (became significantly negative for teachers and non-significant for mothers and fathers) while ADHD-IN continued to show a positive relationship with the externalizing behaviors. Also consistent with studies in North America and Western Europe (Becker, 2014; Becker et al., 2013, 2015; Bernad et al., 2014; Lee et al., 2014; Penny et al., 2009; Willcutt et al., 2014), higher levels of SCT predicted higher levels of anxiety, depression, academic impairment (teachers only with a marginal effect for fathers), and social impairment (teachers only with a marginal effect for mothers) even after controlling for ADHD-IN. Even after controlling for anxiety, depression, as well as ADHD-IN, these unique effects for SCT either remained the same or non-significant effects became significant as initially expected.

Interestingly, SCT and ADHD-IN showed similar unique associations with anxiety and depression for mothers and fathers, whereas in the regression analysis SCT was clearly more strongly associated than ADHD-IN with anxiety and depression for teachers. This finding is similar to results reported in some previous research (Belmar et al., 2015; Lee et al., 2014) but differs from the findings of other studies (Bernad et al., 2014; McBurnett et al., 2014). More studies are needed to shed light on these mixed findings, while also keeping in mind that there is some indication that teachers may be optimal reporters of SCT (Garner et al., 2010). Longitudinal studies are necessary to better understand the developmental relationships between SCT, anxiety, and depression, as well as the possibility that associations may differ across informants and across cultures. Finally, the association

between SCT and social impairment was less clear in this study as compared to previous studies. As noted above, shyness/withdrawal is believed to underlie the association between SCT and social impairment (Becker et al., 2013; Willcutt et al., 2014), and these behaviors may be viewed as less problematic or detrimental in Korean culture. Studies that incorporate more fine-grained measures of social functioning are needed to more thoroughly evaluate this possibility. Overall, the unique external correlates of SCT with ratings by mothers, fathers, and teachers of Korean children supported the validity of SCT and replicated many of the findings from studies in North America and Western Europe.

Limitations and Future Directions

This study provides initial support for SCT's validity among Korean children, but several limitations should be noted. First, the children were recruited from four schools located in a single city in South Korea. The current study was unable to include either within-city or within-country heterogeneity, and findings cannot assume to generalize to other settings in South Korea. Second, even though the study used three different sources, only a single method, a rating scale, was used. Third, the current study was cross-sectional in nature, and as noted above, more longitudinal research is needed to better understand the developmental trajectories associated with SCT and other symptom dimensions, especially anxiety and depression. Fourth, future research should evaluate the measurement and structure invariance of the SCT symptoms across different cultures, and research that incorporates both qualitative and quantitative inquiry into the presentation of SCT symptoms across cultural contexts would be highly informative. The current study, however, provides important preliminary evidence for SCT's validity in Asia and, more specifically, children in South Korea. The SCT dimension demonstrated clear validity using a translated measure of SCT and, importantly, results were consistent across mother, father, and teacher ratings. Our hope is that this study not only adds to the literature but also encourages other research on SCT's internal, external, and cross-cultural validity.

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Table 1**Sluggish Cognitive Tempo, Anxiety, and Depression Items on Parents Scale**Sluggish Cognitive Tempo Items

1. Daydreams during homework or home activities (e.g., stares off during activities; lost in his or her own thoughts during activities)
2. Alertness changes from moment to moment during homework or home activities (e.g., spaces in and out during activities; mind seems to drift off during activities and then return; zones in and out)
3. Absent-minded during homework or home activities (e.g., unaware of current activities or events going on in the home)
4. Loses train of thought during homework or home activities (e.g., suddenly seems to have lost what he or she was about to say or do during activities)
5. Easily confused during homework or home activities (e.g., gets confused working on activities; starts activities over again due to confusion)
6. Looks drowsy during homework or home activities even when he or she has had a good night's sleep (e.g., seems sleepy, yawns) (NOTE: to the best of your knowledge, drowsiness is NOT due to sleep problems at night)
7. Thinking seems slow during homework or home activities (e.g., mind seems sluggish; slow to respond to questions; slow to make decisions or choices)
8. Behavior is slow homework or home activities (e.g., moves at a slow pace; last to finish the activity; slow at routine activities)
9. Lacks energy during homework or home activities (e.g., seems lethargic, underactive, or tired even after having a good night's sleep).

Anxiety Items

1. Seems anxious about separation from parents (e.g., distressed when separated from parents; worries about parents' safety when separated from parents; worries about getting lost or separated from parents)
2. Seems anxious about many things (e.g., worries about nearly everything; worries about many things such as not being good enough, being teased by others, making mistakes, not doing well in school, being in an accident)
3. Seems anxious about specific objects or situations (e.g., excessively fearful of dogs, insects, storms, getting shots, sight of blood, heights, or enclosed places)
4. Seems anxious about contamination (e.g., anxious about germs or dirt; anxious about getting sick; worries about how clean the classroom, bathroom, or lunchroom is)
5. Seems anxious about being in social situations (e.g., worries about performance in front of others; worries about being embarrassed when doing something in front of others such as talking in front of a group; worries about behavior being observed by peers)
6. Reports feeling physically uncomfortable when there is not an apparent cause (e.g., reports having headaches, stomachaches, feeling sick, feeling tense, nausea, dizziness)

Depression Items

1. Seems sad, unhappy, or depressed or expresses feelings of sadness, unhappiness, or depression (e.g., "I feel so sad")
2. Seems to feel worthless or expresses feelings of worthlessness (e.g., "I am stupid," "I can't do anything right")
3. Seems lonely or expresses feelings of loneliness (e.g., "I don't have any friends," "No one ever wants to play with me")
4. Seems not to enjoy home or community activities any more (e.g., does not enjoy activities he or she previously thought were fun; says activities are no longer fun)
5. Seems to feel hopeless about things or expresses feelings of hopelessness (e.g., "I'll never be able to do that," "I could never be as good as other kids")
6. Seems to lack energy necessary to complete tasks or participate in activities (e.g., reports not having energy to do things; seems more fatigued than usual)

Note. The SCT items on the teacher scale are identical except the phrase "classroom activities" is substituted for "homework and home activities."

Table 2

Correlations (Standard Errors) of Sluggish Cognitive Tempo and ADHD-IN Factors with ADHD-HI, ODD, Anxiety, Depression, Academic Impairment, and Social Impairment Factors

	ADHD-HI	ODD	ANX	DEP	AI	SI
Teachers (<i>n</i> = 297)						
SCT	.48 (.05)	.29 (.05)	.66 (.04)	.71 (.05)	.69 (.03)	.61 (.04)
ADHD-IN	.83 (.02)	.58 (.04)	.49 (.06)	.60 (.06)	.78 (.03)	.73 (.04)
Mothers (<i>n</i> = 885)						
SCT	.60 (.03)	.41 (.03)	.54 (.03)	.60 (.04)	.45 (.03)	.41 (.03)
ADHD-IN	.77 (.02)	.53 (.02)	.52 (.03)	.61 (.04)	.57 (.03)	.49 (.03)
Fathers (<i>n</i> = 646)						
SCT	.67 (.03)	.42 (.03)	.65 (.03)	.67 (.04)	.49 (.03)	.42 (.04)
ADHD-IN	.83 (.02)	.56 (.02)	.61 (.03)	.65 (.04)	.57 (.03)	.50 (.03)

Note. All correlations were significant at $p < .01$. SCT = sluggish cognitive tempo; ADHD-IN = attention-deficit/hyperactivity disorder-inattention; ADHD-HI = hyperactivity/impulsivity; ODD = oppositional defiant disorder toward adults and peers; ANX = anxiety; DEP = depression; AI = academic impairment; SI = social impairment.

Table 3

Structural Regression of ADHD-HI, ODD, Anxiety, Depression, Academic Impairment, and Social Impairment Factors on Sluggish Cognitive Tempo and ADHD-IN Factors

Predictors	ADHD-HI		ODD		ANX		DEP		AI		SI	
	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE
Teachers (n = 297)												
SCT	−0.31**	.08	−0.31**	.09	0.66**	.08	0.59**	.07	0.25**	.05	0.15*	.07
ADHD-IN	1.06**	.07	0.81**	.09	0.01 ^{ns}	.08	0.16*	.08	0.59**	.05	0.62**	.07
Mothers (n = 885)												
SCT	0.06 ^{ns}	.05	0.02 ^{ns}	.05	0.32**	.06	0.34**	.07	0.05 ^{ns}	.06	0.10 ⁺	.06
ADHD-IN	0.73**	.05	0.52**	.05	0.28**	.06	0.36**	.07	0.54**	.05	0.41**	.06
Fathers (n = 646)												
SCT	0.04 ^{ns}	.05	−0.05 ^{ns}	.06	0.45**	.06	0.41**	.08	0.10 ⁺	.06	0.06 ^{ns}	.08
ADHD-IN	0.79**	.05	0.60**	.06	0.26**	.07	0.32**	.08	0.49**	.06	0.45**	.07

Note. SCT = sluggish cognitive tempo; ADHD-IN = attention-deficit/ hyperactivity disorder-inattention; ADHD-HI = attention-deficit hyperactivity disorder-hyperactivity/impulsivity; ODD = oppositional defiant disorder toward adults and peers; ANX= anxiety; DEP = depression; AI = academic impairment; SI = social impairment.

⁺ $p < .10$

* $p < .05$.

** $p < .01$.

^{ns} = non-significant