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Sluggish Cognitive Tempo and ADHD-Inattention as Predictors of Externalizing, Internalizing, and Impairment: A Two-Year Longitudinal Study

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Abstract

Although sluggish cognitive tempo (SCT) is distinct from attention-deficit/hyperactivity disorder (ADHD), few studies have examined whether SCT longitudinally predicts psychopathology or impairment. This study examined (1) whether cross-sectional correlates of SCT and ADHD-inattention (IN) from an earlier study with first and second grade children in Spain would replicate with ratings by new teachers and aides when the children are in third grade, and (2) whether SCT and ADHD-IN symptoms assessed in first and second grade uniquely predicted psychopathology as well as academic and social impairment in third grade. The study included 758 first grade (55% boys), 718 second grade (54% boys), and 567 third grade (54% boys) children. Cross-sectional results for third grade children replicated and extended earlier results, with higher levels of SCT uniquely predicting *lower* levels of hyperactivity-impulsivity (HI) and oppositional defiant disorder (ODD) symptoms and *higher* levels of anxiety, depression, academic impairment, and peer rejection (for teachers only) whereas higher levels of ADHD-IN uniquely predicted poorer outcomes across all domains except anxiety. For one- and two-year intervals across different teachers and aides, higher scores on ADHD-IN uniquely predicted poorer outcomes across domains whereas higher scores on SCT uniquely predicted lower levels of ADHD-HI and ODD for both intervals in addition to higher levels of depression (for teachers only) and academic impairment (for one-year interval only). Overall, SCT was significantly associated with important outcomes independent of ADHD-IN, even over one- and two-year intervals with different raters. This study provides further evidence for distinguishing between SCT and ADHD-IN in school settings.

Keywords

ADHD; attention-deficit/hyperactivity disorder; comorbidity; functional impairment; longitudinal; sluggish cognitive tempo

Sluggish Cognitive Tempo (SCT) is characterized by inconsistent alertness (e.g., daydreams, loses train of thought, alertness fluctuates, and confusion) along with slow thinking/slow behavior (Lee et al., 2014). Although an agreed-upon symptom set for SCT remains to be established (Becker, 2013), research increasingly indicates that SCT and attention-deficit/hyperactivity disorder-inattention (ADHD-IN) symptoms represent different dimensions of psychopathology (Barkley, 2013; Becker, Langberg et al., 2014; Becker, Luebbe et al., 2014; Bernad et al., 2014; Cortés et al., 2014; Burns et al., 2013; Lee et al., 2014; McBurnett et al., 2014; Penny et al., 2009; Servera et al., in press; Willcutt et al. 2014).

It is also increasingly apparent that SCT and ADHD-IN have unique correlates. Several studies show that higher levels of SCT are associated with *lower* levels of ADHD-hyperactivity/impulsivity (HI) and oppositional defiant disorder (ODD) symptoms after controlling for ADHD-IN, whereas higher levels of ADHD-IN predict higher levels of ADHD-HI and ODD symptoms after controlling for SCT (Becker, Luebbe et al., 2014; Cortés et al., 2014; Burns et al., 2013; Lee et al., 2014; McBurnett et al. 2014; Penny et al., 2009). In addition, although some exceptions have been reported, several studies show that higher levels of SCT predict higher levels of depression, academic impairment, and social impairment even after controlling for ADHD-IN (Becker, Langberg et al., 2014; Becker, Luebbe et al., 2014; Cortés et al., 2014; Langberg et al., 2014; Lee et al., 2014; McBurnett et al., 2014; Willcutt et al., 2014). However, almost all studies conducted to date have been cross-sectional in nature, leaving the absence of longitudinal research a major limitation of studies seeking to evaluate the external validity of the SCT construct. Although cross-sectional studies are important to establish that SCT and ADHD-IN represent distinct dimensions with different correlates, longitudinal research allows a stronger evaluation of this hypothesis. Given the assumption that SCT and ADHD-IN influence children's subsequent adjustment, longitudinal research allows for a better evaluation of this hypothesis given that SCT and ADHD-IN can be measured prior to the subsequent measures of adjustment (i.e., the longitudinal design allows a better test of the temporal direction of influence).

At this time, only three studies have used a longitudinal design to investigate the correlates of SCT and ADHD-IN. The first study involved a six-month interval with the same teachers rating the children's behavior across the interval (Becker, 2014). This study found that SCT predicted subsequent peer problems even after controlling for prior peer functioning and other psychopathology symptoms (including ADHD, ODD, anxiety/depression). The second study involved a 12-month interval with the same teachers and classroom aides rating the children's behavior at the end of the first and second grades (Bernad et al., 2014). In this study higher levels of SCT in the first grade predicted *lower* scores on ADHD-HI and ODD in the second grade after controlling for ADHD-IN while higher scores on ADHD-IN in the first grade predicted higher scores ADHD-HI and ODD in the second grade after controlling

for SCT. In addition, both SCT and ADHD-IN uniquely predicted academic impairment across the 12-month interval while only ADHD-IN uniquely predicted depression across this interval. This study did not include any measures of anxiety or social impairment (Bernad et al., 2014).

The third study used the same sample from the Bernad et al. (2014) study but examined mothers' and fathers' ratings with a 12-month interval separating the measures of SCT and ADHD-IN from the outcomes (Servera et al., in press). This study found that higher levels of SCT from earlier assessments predicted higher levels of depression, academic impairment, and social impairment at the subsequent assessments after controlling for ADHD-IN (no measure of anxiety was collected). In addition, SCT either showed no relationships with ADHD-HI and ODD or higher levels of SCT predicted lower levels of ADHD-HI and ODD across the interval after controlling for ADHD-IN. In addition, higher levels of ADHD-IN uniquely predicted higher levels of ADHD-HI, ODD, depression, academic and social impairment across the 12-month interval.

Although the findings from the three longitudinal studies examining the correlates of SCT relative to ADHD-IN are promising, a more rigorous evaluation of the longitudinal correlates of SCT relative to ADHD-IN would involve (1) longer time intervals; (2) different raters for the predictors and the outcomes; and (3) a broader range of outcome measures (e.g., separate measures of anxiety and depression as well as broader measures of social difficulties). If the longitudinal results replicate when these methodological conditions are considered, confidence would be bolstered that SCT and ADHD-IN dimensions have robust correlates. We now describe how these three new methodological conditions were implemented into this longitudinal study of SCT and ADHD-IN.

Objectives of the Present Study

This study used ratings by teachers and aides of Spanish children across four occasions—twice at the end of the first grade (Time 1 [T1] and Time 2 [T2] with a 6-week separation), once at the end of the second grade (Time 3 [T3]), and once at the end of the third grade (Time 4 [T4]) to investigate the construct validity of SCT and ADHD-IN. Our first general objective was to examine the convergent and discriminant validity of SCT and ADHD-IN symptoms at T4, as well as whether SCT was statistically distinct from ADHD, ODD, anxiety, depression, and functional impairment. This objective extends earlier findings using the first three time-points and also for the first time includes a measure of anxiety symptoms. Our second general objective was to replicate and extend the cross-sectional results from T1, T2, and T3 (Bernad et al., 2014) with new teachers and aides at T4 and with a broader range of outcome measures (i.e., a measure of anxiety in addition to a measure of depression along with measures of social impairment and peer rejection). Our third general objective was to determine if the 12-month longitudinal correlates of SCT and ADHD-IN from the earlier study (Bernad et al., 2014) would also occur across 12- and 24-month intervals with different teachers and aides across the assessments (i.e., the teachers and aides providing ratings of SCT and ADHD-IN symptoms at T1, T2, and T3 would be different from the teachers and aides providing ratings of other psychopathology symptoms and functional

impairment at T4). We now outline the more specific objectives for these latter two general objectives.

Specific objectives for T4 cross-sectional analyses.

In the three prior analyses (T1, T2, and T3), the same three SCT symptoms for both teachers and aides showed convergent validity (substantial loadings on the SCT factor) and discriminant validity with the ADHD-IN factor (much higher loadings on the SCT factor than the ADHD-IN factor). These three SCT symptoms were *slow thinking*, *slow behavior*, and *drowsy*. The other five SCT symptoms failed to show discriminant validity with the ADHD-IN factor in the prior analyses (Bernad et al., 2014). Our *first objective* was to determine if the same three SCT symptoms showed convergent and discriminant validity when new teachers and aides provided ratings at T4. Our *second objective* with the cross-sectional data was to determine gender differences on the SCT and ADHD-IN factor means. It was predicted that boys would have significantly higher ADHD-IN factor mean than girls but that boys and girls would not differ significantly on the SCT factor.

Our *third objective* was to evaluate the SCT, ADHD-IN, ADHD-HI, ODD, anxiety, depression, academic impairment, social impairment, and peer rejection nine-factor measurement model. Of note, teacher/aide ratings from T1, T2, and T3 did not include measures of anxiety or social functioning. It was predicted that this model would show excellent global fit with substantial item-factor loadings along with high reliability coefficients for the factors. It was also predicted that the teacher-aide correlations for same factor would be reasonable. SCT and ADHD-IN factors were also predicted to show the same pattern of correlations with the other factors as in the analyses at T1, T2, and T3 (i.e., ADHD-IN will have significantly stronger correlations with ADHD-HI and ODD than SCT while SCT and ADHD-IN correlations with internalizing symptoms, academic impairment, social impairment, and peer rejection will not differ significantly).

The *fourth objective* was to determine unique relationships of SCT and ADHD-IN with ADHD-HI, ODD, anxiety, depression, academic impairment, social impairment, and peer rejection. It was predicted that higher scores on ADHD-IN would predict higher scores on ADHD-HI and ODD even after controlling for SCT, while higher scores on SCT would predict *lower* scores on ADHD-HI and ODD after controlling for ADHD-IN. It was also predicted that higher scores on SCT and ADHD-IN would both uniquely predict higher levels of anxiety, depression, academic impairment, social impairment, and peer rejection. To ensure that SCT's unique relationships with the various outcomes were not due to SCT's overlap with anxiety and depression, these regression analyses were repeated controlling for anxiety and depression as well as ADHD-IN. It was predicted that SCT's unique relationships with the outcomes would remain the same.

Specific objectives for one- and two-year longitudinal analyses.

The *first objective* for the longitudinal analyses was to determine the correlations of SCT and ADHD-IN from T1, T2, and T3 with the ADHD-HI, ODD, anxiety, depression, academic impairment, social impairment, and peer rejection domains at T4 (separation of 24 months, 22.5 months, and 12 months, respectively). It was predicted that the longitudinal

factor correlations across different raters would show the same pattern as the cross-sectional and longitudinal correlations with the same raters (Bernad et al., 2014).

The *second objective* was to determine the unique relationships of SCT and ADHD-IN from T1, T2, and T3 with ADHD-HI, ODD, anxiety, depression, academic impairment, social impairment, and peer rejection at T4. It was predicted that the unique relationships across the various time intervals with different raters for predictors and outcomes would be similar to the cross-sectional and longitudinal unique relationships with the same raters for predictors and outcomes.

Support for these six objectives, especially the two objectives associated with the longitudinal analyses, would significantly increase our confidence that SCT and ADHD-IN are distinct dimensions. To the best of our knowledge, the current study represents the first to examine the correlates of SCT and ADHD-IN with this type of longitudinal design. That is, this is the first study to examine SCT and ADHD-IN symptoms across a two-year interval and, furthermore, to use different raters for the predictor and outcome constructs.

Methods

Participants and Procedures

The 46 elementary schools on the island of Majorca in the Balearic Islands (Spain) were invited to participate in the study with 43 expressing interest. Twenty-two of these 43 schools were then randomly selected to participate with eight additional elementary schools from Madrid (Spain) also invited for a total of 30 schools. The potential participants in the study were the teachers and classroom aides of the 1,045 first grade children in these schools. A cover letter that explained the purpose of the study was given to children's teachers and aides. The cover letter indicated that participation by teachers and aides was voluntary and anonymous. Parents gave permission for the teachers and aides to complete the ratings. The protocol was approved by the IRB of the University of the Balearic Islands. Teachers and aides were not compensated for their participation.

T1 and T2 occurred in the spring of the first grade year (6-week separation). T3 occurred in the spring of the second grade year (12 months after T1) and T4 occurred in the spring semester of the third grade year (12 months after T3; 24 months after T1). As children the children were in the same classroom for first and second grades, the same teachers and aides completed the ratings at T1, T2, and T3. Different teachers and aides, however, completed the ratings at T4 when children were in third grade.

At T1, teachers and aides from 28 of the 30 schools participated in the study, at T2 teachers and aides from 29 of 30 schools participated, and at T3 and T4 teachers and aides from 30 of 30 schools participated (even when a school agreed to participate at the administrative level, teachers and aides were still free to decline participation). At T1, 61 teachers and 49 aides participated in the study with teachers rating an average of 11.76 ($SD = 5.09$, $n = 743$) children and aides an average of 9.02 ($SD = 6.58$, $n = 574$) children. At T2, 58 teachers and 51 aides participated with teachers rating an average of 10.93 ($SD = 5.27$, $n = 679$) children and aides an average of 9.93 ($SD = 6.45$, $n = 623$) children. For T3, 62 teachers and 59 aides

participated with teachers rating an average of 11.19 ($SD = 4.43$, $n = 701$) children and aides an average of 10.45 ($SD = 5.18$, $n = 664$) children. At T4, 63 teachers and 57 aides participated with each teacher rating an average of 8.92 ($SD = 4.38$, $n = 561$) children and each rating an average of 8.96 ($SD = 4.21$, $n = 508$) children.

There were 758 unique children (55% boys) at T1, 746 unique children (54% boys) at T2, 718 (54% boys) at T3, and 567 unique children (54% boys) at T4. At T1, the average age of children was approximately 7 years with little variation. Although ethnicity was not collected for the individual children, at the school level, approximately 90% of the first grade children were Caucasian and 10% were North African.

Measures

Child and Adolescent Disruptive Behavior Inventory (CADBI, Burns et al., 2014).

Teachers and aides completed the CADBI. The CADBI measures SCT (eight symptoms), ADHD-IN (nine symptoms), ADHD-HI (nine symptoms), ODD toward adults (e.g., argues with adults; eight symptoms), ODD toward peers (e.g., argues with peers; eight symptoms), anxiety (six symptoms), depression (seven symptoms), academic impairment (four items: *completion of homework, reading skills, arithmetic skills, and writing skills*), and social impairment (four items: *quality of interactions with teacher, quality of interactions with other adults at school, quality of interactions with peers in the classroom, and quality of interactions with peers outside of the classroom at school*). Table 1 shows the wording of the SCT, anxiety, and depression symptoms (the full CADBI is available from the corresponding author upon request). The wording of the ADHD and ODD symptoms was based on the *DSM-5* descriptions of these symptoms with the examples specific to the school setting. The two ODD scales were combined into a single ODD scale for the analyses.

The symptoms were rated on a 6-point frequency of occurrence scale (i.e., *almost never* [*never or about once per month*], *seldom* [*about once per week*], *sometimes* [*several times per week*], *often* [*about once per day*], *very often* [*several times per day*], and *almost always* [*many times per day*]). A 7-point scale was used for the four academic and four social impairment items (*severe difficulty, moderate difficulty, slight difficulty, average performance* [*average interactions*] *for grade level, slightly above average, moderately above average, and excellent performance* [*excellent interactions*] *for grade level*). The academic and social impairment items were reversed keyed so higher scores represent higher levels of impairment. Teachers and aides were instructed to make their ratings independently. Earlier studies provide support for the reliability and validity of the scores from the scales (Bernad et al., 2014; Lee et al., 2014; Skansgaard & Burns 1998). Of note, the anxiety scale was used for the first time in this study. Table 2 shows the reliability coefficients and teacher-aide factor correlations for the scales.

Dishion Social Acceptance Scale (DSAS, Dishion, 1990).

The DSAS is a three-item teacher rating scale that assesses a child's peer rejection (i.e., [1] being liked by peers, [2] being disliked by peers, and [3] being ignored by peers). Teachers and aides rated the proportion of classmates who "dislike," "like," and "ignore" the target

child on a 5-point scale (*very few* [*less than 25%*]; *some* [*25 to 49%*]; *about half* [*50%*]; *many* [*51 to 75%*]; and *almost all* [*greater than 75%*]). The three items were used to define a peer rejection latent factor (the “like” item was reversed key). This is a well-validated measure (Dishion, 1990) with scores being associated with peer sociometric nominations (Lee & Hinshaw, 2006). Table 2 shows the reliability coefficients and teacher-aide factor correlation for this measure for this study.

General Analytic Strategy—The item ratings were treated as ordered-categories and the analyses used the robust weighted least squares (WLSMV) estimator (Mplus Version 7.3; Muthén & Muthén, 1998–2012). The WLSMV estimator uses a pairwise deletion procedure to deal with missing information (i.e., the analysis is performed on the underlying latent response variable polychoric correlation matrix). All the analyses also took into account the children were nested within 30 schools (Type = complex Mplus option). The fit of the measurement model was evaluated with the comparative fit index (CFI, study criterion .95), Tucker-Lewis Index (TLI, study criterion .95), and the root mean square error of approximation (RMSEA, study criterion .05). The Mplus model constraint procedure was used to determine if factor correlations differed significantly from each other.

Results

Convergent and Discriminant Validity of SCT and ADHD-IN Symptoms

An *a priori* two-factor model was applied to teachers’ and aides’ ratings of the eight SCT and nine ADHD-IN symptoms to determine the convergent and discriminant validity of these symptoms (i.e., the analysis was restricted to two factors with cross-loadings allowed in order to determine if SCT symptoms loaded substantially higher on the SCT factor than the ADHD-IN factor). For an SCT symptom to have convergent and discriminant validity, the symptom had to load higher than .60 on the SCT factor and lower than .30 on the ADHD-IN factor. The same criteria were applied to the ADHD-IN symptoms.

For teachers’ ratings, five of the eight SCT symptoms had loadings greater than .60 (range = .86 to .97) on the SCT factor and loadings less than .30 on the ADHD-IN factor (range = .05 to .12). These five SCT symptoms were *daydreams*, *alertness fluctuates*, *drowsy*, *thinking is slow*, and *behavior is slow*. The other three SCT symptoms (*absent-minded*, *loses train of thought*, and *easily confused*) failed to show good discriminant validity with the ADHD-IN factor (i.e., primary loadings of approximately .58 and cross-loadings of approximately .39). For teachers, all nine ADHD-IN symptoms showed substantial loadings on the ADHD-IN factor ($M = .91$, $SD = .07$) and low loading on the SCT factor ($M = .02$, $SD = .10$).

For aides’ ratings, three of the eight SCT symptoms had loadings greater than .60 (range .81 to 1.03) on the SCT factor and loadings less than .30 on the ADHD-IN factor (range = $-.09$ to .06). These three SCT symptoms were *drowsy*, *thinking is slow*, and *behavior is slow*. The other five SCT symptoms failed to show good discriminant validity (i.e., loadings higher than .30 on the ADHD-IN factor [range .30 to .51] with loadings approximately .60 on the SCT factor). For aides, all nine ADHD-IN symptoms showed substantial loadings on the ADHD-IN factor ($M = .94$, $SD = .07$) with loading close to zero on the SCT factor ($M = .00$, $SD = .08$).

Operationalization of SCT Construct

Given that the *drowsy*, *thinking is slow*, and *behavior is slow* SCT symptoms showed strong convergent and discriminant validity across both teachers' and aides' ratings in this study and these same three SCT symptoms also showed strong convergent and discriminant validity for a different set of teachers and aides at T1, T2, and T3 (Bernad et al., 2014), the SCT construct was defined by these three symptoms in order to be able to compare the SCT construct across the four assessments.

Fit of Measurement Model

Global fit.—A confirmatory factor analysis (CFA) was used to evaluate the fit of the SCT, ADHD-IN, ADHD-HI, ODD, anxiety, depression, academic impairment, social impairment, and peer rejection nine-factor model. For teachers' ratings, the model provided an excellent global fit, $\chi^2(1238) = 1882$, $p < .001$, CFI = .982, TLI = .981, and RMSEA = .030 (90% CI: .028, .033). The global fit was also excellent for aides' ratings, $\chi^2(1238) = 1728$, $p < .001$, CFI = .982, TLI = .981, and RMSEA = .028 (90% CI: .025, .031).

Item-factor loadings.—The three SCT symptoms showed strong loadings on the SCT factor for teachers and aides ($M = .92$, $SD = .06$). Similar results occurred for the ADHD-IN ($M = .93$, $SD = .02$), ADHD-HI ($M = .93$, $SD = .02$), ODD ($M = .90$, $SD = .06$), anxiety ($M = .88$, $SD = .05$), depression ($M = .90$, $SD = .04$), academic impairment ($M = .94$, $SD = .02$), social impairment ($M = .90$, $SD = .08$), and peer rejection ($M = .86$, $SD = .05$) items.

Reliability coefficients.—SCT scale scores contained 92% true score variance for both teachers and aides. The values for the other scales were higher than 90% with the exception of the anxiety scale for teachers (85%) and the peer rejection scale for teachers (82%) and aides (76%). The reliability coefficients are shown in Table 2.

Teacher-aide factor correlations.—Table 2 shows the teacher-aide factor correlations for the same factors (inter-rater correlations). The teacher-aide factor correlation for SCT was .74 with the other values ranging from .53 (anxiety) to .82 (ADHD-IN).

Gender Differences on SCT and ADHD-IN Factors

An invariance analysis was used to determine if the SCT and ADHD-IN symptoms had invariant like-item loadings and thresholds across sex and, if so, to evaluate the latent means differences on the SCT and ADHD-IN factors as a function of sex. There was no meaningful decrement in model fit from the configural model (no constraints) to the model with like-item loadings and thresholds constrained equal for teachers and aides (CFI decreases for both analyses were .002). Boys had significantly higher scores on the ADHD-IN factor than girls (teachers: Cohen's latent $d = 0.32$, $p = .02$; aides: Cohen's latent $d = 0.54$, $p < .001$). Although boys and girls did not differ on their mean SCT factor scores for teachers (Cohen's latent $d = 0.16$, $p = .21$), boys did have significantly higher SCT scores for aides' ratings (Cohen's latent $d = 0.31$, $p = .02$).

Cross-Sectional Correlations among Factors

Table 3 shows the correlations among the factors for teachers and aides. It was predicted that ADHD-IN would have a significantly stronger correlation with ADHD-HI and ODD than SCT's correlations with ADHD-HI and ODD. In contrast, it was predicted that ADHD-IN and SCT would be equally correlated with anxiety, depression, academic impairment, social impairment, and peer rejection.

ADHD-IN's relationship with ADHD-HI and ODD was significantly stronger than SCT's relationship with these factors ($ps < .001$) for teachers and aides. For teachers and aides, SCT's and ADHD-IN's associations with depression, peer rejection, and academic impairment did not differ significantly ($ps > .05$). SCT, however, showed a significantly ($ps < .05$) stronger relationship with anxiety than ADHD-IN for teachers and aides although the magnitude of the difference was small (teachers: 0.60 vs. 0.55; aides: 0.69 to 0.61). For aides, SCT showed a weaker relationship ($p = .003$) with social impairment than ADHD-IN (0.35 vs. 0.47).

Cross-Sectional Unique Effects of SCT and ADHD-IN on ADHD-HI, ODD, Anxiety, Depression, Academic Impairment, Social Impairment, and Peer Rejection

Analytic strategy.—A structural regression analysis was used to determine the unique effects of SCT and ADHD-IN on ADHD-HI, ODD, anxiety, depression, academic impairment, social impairment, and peer rejection at T4. Figure 1 shows this model and Table 4 shows the partial standardized regression coefficients for the analysis with teachers and the analysis with aides.

Unique effects of SCT and ADHD-IN on ADHD-HI and ODD.—Higher scores on SCT predicted significantly *lower* scores on ADHD-HI and ODD after controlling for ADHD-IN while higher scores on ADHD-IN predicted *higher* scores on ADHD-HI and ODD after controlling for SCT ($ps < .05$). These results mean that true score variance on SCT that was independent of true score variance on ADHD-IN (28% to 34% of the total true score variance for SCT) showed a *negative* relationship with ADHD-HI and ODD while true score variance on ADHD-IN that was independent of the SCT (28% to 34%) showed a *positive* relationship with ADHD-HI and ODD.

Unique effects of SCT and ADHD-IN on anxiety and depression.—Higher scores on SCT predicted significantly higher scores on anxiety and depression after controlling for ADHD-IN while higher scores on ADHD-IN only predicted significantly higher scores on depression after controlling for SCT ($ps < .001$).

Unique effects of SCT and ADHD-IN on academic impairment.—Higher scores on SCT predicted significantly higher levels of academic impairment after controlling for ADHD-IN while higher scores on ADHD-IN predicted significantly higher levels of academic impairment after controlling for SCT ($ps < .001$).

Unique effects of SCT and ADHD-IN on social impairment and peer rejection.—While higher scores on ADHD-IN predicted significantly higher levels of social

impairment and peer rejection after controlling for SCT ($p < .05$), SCT did not uniquely predict social impairment and only uniquely predicted peer rejection for teachers ($p < .05$).

Role of Depression and Anxiety in SCT's Unique Associations with ADHD-HI, ODD, Academic Impairment, and Peer Rejection

SCT's unique relationships with ADHD-HI, ODD, and academic impairment in the previous regression analysis remained significant ($p < .001$) even after controlling for anxiety and depression as well as ADHD-IN. However, SCT's unique relationship with peer rejection for teachers from the above regression analysis was no longer significant after controlling for anxiety, depression, and ADHD-IN.

One- and Two-Year Stability of SCT and ADHD-IN Factors¹

The one-year stability coefficients (factor correlations) for SCT were 0.57 ($SE = .04$) and 0.51 ($SE = .04$) for teachers and aides with the respective values for ADHD-IN being 0.69 ($SE = .04$) and 0.67 ($SE = .04$). The two-year stability coefficients for SCT were 0.46 ($SE = .05$) and 0.42 ($SE = .07$) for teachers and aides with the respective values for teacher and aides for ADHD-IN being 0.60 ($SE = .05$) and 0.55 ($SE = .05$). The stability coefficients are based on different raters across the time points (i.e., T1 to T4; T3 to T4).

One- and Two-Year Bivariate Relationships of SCT and ADHD-IN with ADHD-HI, ODD, Anxiety, Depression, Academic Impairment, Social Impairment, and Peer Rejection

Table 5 shows the correlations of SCT and ADHD-IN from T1 and T3 with ADHD-HI, ODD, anxiety, depression, academic impairment, social impairment, and peer rejection from T4. Two years separated T1 and T4 while one year separated T3 and T4.

One-year interval.—For the one-year interval, higher scores on ADHD-IN and SCT were significantly associated with higher scores ADHD-HI, ODD, anxiety, depression, social impairment, academic impairment, and peer rejection ($p < .05$). These correlations also showed a similar pattern to the cross-sectional correlations. ADHD-IN showed a significantly stronger relationship with ADHD-HI and ODD than SCT ($p < .001$) with ADHD-IN and SCT being equally correlated with anxiety, depression, academic impairment, social impairment, and peer rejection ($p > .05$). The two exceptions were SCT showed a smaller correlation with social impairment for teachers ($p = .03$) and a smaller correlation with peer rejection for aides ($p = .002$).

Two-year interval.—For the two-year interval, higher levels of ADHD-IN were significantly associated with higher levels of ADHD-HI, ODD, anxiety, depression, social impairment, academic impairment, and peer rejection ($p < .05$). The same results occurred for SCT with two exceptions. SCT was not related to ADHD-HI and anxiety across the two-year interval. These correlations also showed a similar pattern to the cross-sectional correlations. ADHD-IN showed a significantly stronger relationship with ADHD-HI and

¹The T2 to T4 results (22.5 month interval) were the same as the T1 to T4 results (24 month interval) with a three exceptions. The one exception for SCT was that this factor did not uniquely predict peer rejection for teachers with the two exceptions for ADHD-IN being a non-significant unique relationship with anxiety (teachers only) and depression (aides only). These results are available from the fourth author.

ODD than SCT ($ps < .001$) with ADHD-IN and SCT being equally related to anxiety, depression, academic impairment, social impairment, and peer rejection ($ps > .05$). The two exceptions were SCT showed a smaller correlation with academic impairment for teachers ($p = .03$) and a smaller correlation with depression for aides ($p = .001$).

One- and Two-Year Unique Longitudinal Effects of SCT and ADHD-IN on ADHD-HI, ODD, Anxiety, Depression, Academic Impairment, Social Impairment, and Peer Rejection

ADHD-HI, ODD, anxiety, depression, academic impairment, social impairment, and peer rejection from T4 were regressed on SCT and ADHD-IN from T1 as well as SCT and ADHD-IN from T3. Figure 1 shows the structural model and Table 6 shows the standardized partial regression coefficients from these four structural regression analyses (i.e., one each for teachers and aides for the one-year interval and one each for teachers and aides for the two-year interval).

One-year interval.—Higher scores on ADHD-IN at T3 predicted significantly higher scores on ADHD-HI, ODD, anxiety, depression, academic impairment, social impairment, and peer rejection at T4 after controlling for SCT at T3. Higher scores on SCT at T3 predicted significantly ($ps < .05$) lower scores on the ADHD-HI and ODD factors at T4 after controlling for ADHD-IN at T3. SCT at T3 also showed significant unique relationships with the depression (teachers only, $p < .05$) and academic impairment (teachers $p < .05$ and aides $p = .07$) at T4.

Two-year interval.—For the two-year interval, higher scores on ADHD-IN at T1 significantly ($ps < .05$) predicted higher scores on ADHD-HI, ODD, anxiety, depression, academic impairment, social impairment, and peer rejection at T4 even after controlling for SCT at T1. For SCT, higher scores at T1 predicted significantly ($ps < .05$) lower scores on ADHD-HI and ODD at T4 after controlling for ADHD-IN at T1. SCT's only other significant ($p < .05$) unique relationship across the two-year interval was with peer rejection for teachers' ratings, with higher SCT scores uniquely predicting greater peer rejection.²

Discussion

Few studies have examined the longitudinal correlates of SCT, and we are unaware of any longitudinal study to date that has evaluated whether SCT is longitudinally associated with other psychopathology and functional impairment domains when different raters are used across time-points. This study is a first step in filling this gap in the research by replicating and extending previous findings from a longitudinal study of SCT and ADHD in Spanish children (Bernad et al., 2014; Burns et al., 2013; Servera et al., in press). This study had three overarching objectives. First, we examined the *convergent and discriminant validity* of

²Becker (2014) created a measure of negative social preference by subtracting the dislike item from the like item and then reverse keying the new item so that higher scores indicate higher levels of negative social preference. All our cross-sectional and longitudinal regression analyses were repeated with this negative social preference item. The cross-sectional and longitudinal regression analyses (i.e., T1 to T4, T2 to T4, and T3 to T4) for teachers and aides all indicated that higher levels of ADHD-IN predicted higher levels negative social preference after controlling for SCT while two of the three analyses yielded a significant unique effect for SCT using teachers' ratings (i.e., the cross-sectional analysis for teachers and the T1 to T4 longitudinal analysis for teachers). None of the three analyses yielded a significant unique effect for SCT using aides' ratings.

SCT and ADHD-IN symptoms at T4, and we also tested whether SCT was distinct from not only ADHD-IN but also ADHD-HI, ODD, anxiety, depression, and functional impairment. The second objective of this study was to determine if the previously-identified unique *cross-sectional correlates* of SCT and ADHD-IN with teachers' and aides' ratings of the children in first and second grades (Bernad et al., 2014) would replicate with ratings by new teachers and aides when the children were in the third grade. The third objective was to determine if the previously-identified unique *longitudinal correlates* of SCT and ADHD-IN over a one-year interval with the same raters at each occasion (Bernad et al., 2014) would also occur over one- and two-year intervals with different raters for the predictors (SCT and ADHD-IN) and the outcomes (ADHD-HI, ODD, anxiety, depression, academic impairment, social impairment, and peer rejection). We now consider findings pertaining to each of these three objectives.

Internal Validity of SCT

Three SCT symptoms (i.e., *drowsy*, *thinking is slow*, *behavior is slow*) showed good convergent and discriminant validity from ADHD-IN symptoms across both teachers' and aides' ratings at T4 when the children were in third grade and were also distinguished from other psychopathology symptoms (i.e., ADHD-HI, ODD, anxiety, depression) and functional impairment domains. These three items are the same symptoms that showed adequate validity at the first three time-points when children were in first and second grades and were rated by different teachers and aides (Bernad et al., 2014). These symptoms represent the *slow* dimension of SCT (Cortés et al., 2014; Lee et al., 2014) that generally corresponds to the *sluggish* dimension found in other studies using different measures of SCT (Barkley, 2013; Penny et al., 2009). It is not surprising that the *slow* dimension of SCT was most clearly separable from ADHD-IN, as previous studies have shown *the slow/sluggish component* of SCT to be less strongly correlated than the alertness/day dreamy component of SCT with ADHD-IN (Barkley, 2013; Cortés et al., 2014). However, it is important to note that two additional SCT symptoms from the alertness component of SCT (i.e., *daydreams*, *alertness fluctuates*) also showed good convergent and discriminant validity from ADHD-IN symptoms using T4 teachers' ratings even though these symptoms failed to show such validity using aides' ratings. These two items were ultimately not included in subsequent analyses in order to keep the SCT scale comparable across time-points and raters, but this finding nonetheless points to a separable inconsistent alertness component of SCT emerging when children are in third grade, at least based on teacher ratings. It is possible that teachers are more attuned than aides to children's excessive daydreaming or fluctuations in alertness, particularly since teachers tend to observe children in a group, classroom context whereas aides often work with students in an individualized or small-group format where, perhaps, children are more directly engaged and less prone to daydreaming. This possibility warrants investigation in future research.

Unique Cross-Sectional Correlates of SCT and ADHD-IN

The cross-sectional analysis with new teachers and aides with the children now in the third grade (T4) indicated that SCT had a broad range of unique correlates even after controlling for ADHD-IN. First, higher scores on SCT predicted *lower* scores on ADHD-HI and ODD when controlling for ADHD-IN, a finding that is consistent with previous time-points and

a stringent test of external validity. Further, the first-order correlations across time showed SCT symptoms to be almost universally associated with later adjustment across both teacher and aide ratings, with many of these correlations evincing medium-to-large effects. There is certainly a need for additional longitudinal studies that also include the inconsistent alertness/daydreaming component of SCT.

Limitations and Future Directions

As noted above, the current study used three SCT symptoms representing the slow/sluggish dimension of SCT (Cortés et al., 2014) and did not include the daydreaming dimension of SCT (e.g., daydreams, alertness fluctuates, absent-minded, loses train of thought; see Table 1). Although the daydreaming and alertness fluctuates SCT symptoms did show discriminant validity with ADHD-IN for teachers' ratings in the current study, the reason the other five SCT symptoms failed to show discriminant validity with the ADHD-IN dimension across the three years of teachers' and aides' ratings (this study as well as Bernad et al., 2014) is not obvious. Our best hypothesis is that the large number of children rated by the individual teachers and aides reduced the discriminant validity of the daydreaming dimension with ADHD-IN (Cortés et al., 2014; Lee et al., 2014). Future studies should probably restrict the number of students rated by each teacher to a smaller number than the current study. For example, Lee et al. (2014) restricted the teachers to rating only eight American children and Khadka et al. (in preparation) restricted the teachers to rating only six Nepali children, with analyses from both of these studies indicating all eight SCT symptoms have good discriminant validity. However, it is also worth noting that both Lee et al. (2014) and Khadka et al. (in preparation) used the original English version of the CADBI whereas the current study used a Spanish translation, which also may have impacted the findings.

In addition, in order to extend results beyond the school setting, it will be important to determine the unique longitudinal correlates of SCT and ADHD-IN with ratings by mothers and fathers across longer intervals than 12 months (Servera et al., in press) as well as to include children's self-report ratings of SCT as they enter middle childhood and approach adolescence (Becker, Luebbe, & Joyce, in press). This is especially important since there is some evidence that SCT may be related to greater impairment at home than at school (Watabe, Owens, Evans, & Brandt, 2014). Nonetheless, consistency in the correlates across home and school settings would further increase our confidence in SCT representing a distinct construct from ADHD-IN. It will also be important to investigate further SCT unique relationships with various aspects of social impairment (Becker, 2014) and other domains of adjustment such as emotion regulation (Flannery et al., 2014) and sleep functioning (Becker, Luebbe, & Langberg, 2014).

Conclusion

This is the first study to examine the two-year longitudinal correlates of SCT, and in doing so we were also able to test whether SCT predicted adjustment when different raters were used across time-points. This study is thus an important replication and of an earlier study with this sample (Bernad et al, 2014) as well as other studies linking SCT to other psychopathology symptoms and functional impairment. Consistent with earlier research, cross-sectional results from the present study show higher SCT scores to predict lower

ADHD-HI and ODD scores along with higher scores on anxiety, depression, academic impairment, and peer rejection (teachers only) even after controlling for ADHD-IN. The one- and two-year longitudinal results from the current study with different teachers and aides for the predictors and the outcomes also replicated the earlier longitudinal results with the same teachers for predictors and outcomes for a one-year interval (Bernad et al., 2014). For the one and two-year intervals, higher levels of SCT predicted lower levels of ADHD-HI and ODD and, just for the one-year interval, higher levels of depression (teachers only) and academic impairment. These results provide initial evidence for SCT being both distinct from ADHD-IN and also cross-sectionally and longitudinally associated with children's adjustment. Additional research is needed to further evaluate the predictive validity of SCT, including longer time frames, additional informants, and incorporation of both the slow/sluggish and alertness/daydreaming aspects of SCT.

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Cross-Sectional and Longitudinal Structural Regression Model

Figure 1.

Cross-sectional and longitudinal structural regression model. Each latent variable was defined by manifest variables (not shown in the path diagram). Each analysis allowed correlations among all disturbances (not shown in the path diagram). For the longitudinal analyses, 12- and 24-months separated the predictors and outcomes. SCT = sluggish cognitive tempo; ADHD = attention-deficit/ hyperactivity disorder; IN = Inattention; HI = hyperactivity-impulsivity; and ODD = oppositional defiant disorder.

Table 1**Anxiety and Depression Symptoms for Current Study****Anxiety Symptoms**

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 Symptoms

1. Seems sad, unhappy, or depressed or expresses feeling of sadness, unhappiness, or depression (e.g., "I feel 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 friends," "No one ever wants to play with me")
4. Seems not to enjoy school activities any more (e.g., does not enjoy activities he or she previously thought were fun; says school 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)

Table 2

Reliability Coefficients (Standard Errors) and Inter-Rater Factor Correlations (Standard Errors) for Measures at Third Grade

	<u>Reliability Coefficients</u>		<u>Inter-Rater</u> ³
	Teachers ¹	Aides ²	
SCT	0.92 (.007)	0.92 (.011)	.74 (.04)
ADHD-IN	0.97 (.003)	0.97 (.003)	.82 (.03)
ADHD-HI	0.96 (.005)	0.96 (.005)	.79 (.03)
ODD	0.97 (.005)	0.97 (.004)	.66 (.02)
Anxiety	0.85 (.015)	0.91 (.013)	.53 (.08)
Depression	0.91 (.017)	0.93 (.009)	.68 (.07)
Academic Impairment	0.95 (.004)	0.96 (.005)	.79 (.02)
Social Impairment	0.92 (.006)	0.89 (.007)	.60 (.05)
Peer Rejection	0.82 (.019)	0.76 (.022)	.76 (.07)

Note. Confirmatory factor analytic procedures were used to calculate the reliability coefficients (i.e., the amount of true score variance in the measure) and the inter-rater factor correlations (i.e., the correlations between the same factors for teachers and aides). SCT = sluggish cognitive tempo; ADHD-IN = attention-deficit/hyperactivity disorder-inattention; HI = hyperactivity/impulsivity; ODD= oppositional defiant disorder.

¹
n = 561;

²
n = 508;

³
n = 567;

Table 3

Correlations among Sluggish Cognitive Tempo, ADHD-IN, ADHD-HI, ODD, Anxiety, Depression, Academic Impairment, Social Impairment and Peer Rejection for Teachers (Aides) at Third Grade

	SCT	IN	HI	ODD	ANX	DEP	AI	SI	PR
SCT	----								
IN	0.85(0.81)	----							
HI	0.33(0.43)	0.68(0.72)	----						
ODD	0.33(0.33)	0.47(0.48)	0.55(0.59)	----					
ANX	0.60(0.69)	0.55(0.61)	0.50(0.57)	0.38(0.42)	----				
DEP	0.81(0.82)	0.77(0.78)	0.40(0.50)	0.40(0.43)	0.79(0.84)	----			
AI	0.72(0.70)	0.76(0.71)	0.27(0.28)	0.27(0.20)	0.30(0.31)	0.57(0.54)	----		
SI	0.46(0.35)	0.50(0.47)	0.38(0.31)	0.44(0.38)	0.29(0.25)	0.51(0.41)	0.65(0.62)	----	
PR	0.59(0.59)	0.61(0.65)	0.39(0.53)	0.48(0.49)	0.49(0.45)	0.62(0.60)	0.57(0.58)	0.68(0.70)	----

Note. All correlations were significant at $p < .001$. The range for the standard errors was from 0.02 to 0.07. SCT = sluggish cognitive tempo; ADHD-IN = attention-deficit/hyperactivity disorder-inattention; ADHD-HI = hyperactivity/impulsivity; ODD = oppositional defiant disorder; ANX= anxiety; DEP = depression; AI = academic impairment; SI = social impairment; PR = peer rejection.

Table 4

Cross-Sectional Structural Regression of ADHD-HI, ODD, Anxiety, Depression, Academic Impairment, Social Impairment, and Peer Rejection on the Sluggish Cognitive Tempo and ADHD-Inattention Factors at Third Grade

Predictors	Outcomes						
	ADHD-HI β (<i>SE</i>)	ODD β (<i>SE</i>)	ANX β (<i>SE</i>)	DEP β (<i>SE</i>)	AI β (<i>SE</i>)	SI β (<i>SE</i>)	PR β (<i>SE</i>)
SCT							
Teachers	−0.83 (0.11)**	−0.26 (0.09)*	0.50 (0.10)**	0.55 (0.07)**	0.28 (0.06)**	0.13 (0.15) ^{ns}	0.24 (0.10)*
Aides	−0.45 (0.11)**	−0.16 (0.09)*	0.58 (0.07)**	0.57 (0.07)**	0.37 (0.09)**	−0.19 (0.12) ^{ns}	0.15 (0.13) ^{ns}
ADHD-IN							
Teachers	1.97 (0.10)**	0.69 (0.09)**	0.13 (0.08) ^{ns}	0.31 (0.07)**	0.52 (0.06)**	0.39 (0.14)*	0.40 (0.10)*
Aides	1.09 (0.09)**	0.61 (0.09)**	0.15 (0.09) ^{ns}	0.33 (0.06)**	0.41 (0.07)**	0.54 (0.10)**	0.39 (0.11)*

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

* $p < .05$.

** $p < .001$.

Table 5

Correlations (SEs) of Sluggish Cognitive Tempo and ADHD-Inattention from Grades One and Two with ADHD-HI, ODD, Anxiety, Depression, Academic Impairment, Social Impairment, and Peer Rejection at Grade 3

Grade 3 Variables								
	ADHD-HI	ODD	ANX	DEP	AI	SI	PR	
<u>Grade 1 Variables</u>								
SCT								
Teachers	0.07 (0.07) ^{ns}	0.15 (0.05) [*]	0.12 (0.07) ^{ns}	0.37 (0.07) ^{**}	0.55 (0.05) ^{**}	0.41 (0.05) ^{**}	0.47 (0.04) ^{**}	***
Aides	0.03 (0.07) ^{ns}	0.10 (0.05) [*]	0.12 (0.10) ^{ns}	0.32 (0.08) ^{**}	0.47 (0.06) ^{**}	0.25 (0.10) [*]	0.37 (0.09) ^{**}	***
ADHD-IN								
Teachers	0.35 (0.06) ^{**}	0.30 (0.04) ^{**}	0.22 (0.06) ^{**}	0.39 (0.05) ^{**}	0.62 (0.03) ^{**}	0.44 (0.03) ^{**}	0.51 (0.04) ^{**}	***
Aides	0.36 (0.06) ^{**}	0.25 (0.05) ^{**}	0.21 (0.08) [*]	0.42 (0.07) ^{**}	0.52 (0.05) ^{**}	0.35 (0.09) ^{**}	0.47 (0.07) ^{**}	***
<u>Grade 2 Variables</u>								
SCT								
Teachers	0.18 (0.06) [*]	0.22 (0.05) ^{**}	0.27 (0.06) ^{**}	0.55 (0.05) ^{**}	0.58 (0.05) ^{**}	0.34 (0.06) ^{**}	0.51 (0.05) ^{**}	***
Aides	0.18 (0.07) [*]	0.16 (0.05) ^{**}	0.27 (0.05) ^{**}	0.43 (0.05) ^{**}	0.57 (0.06) ^{**}	0.41 (0.07) ^{**}	0.42 (0.08) ^{**}	***
ADHD-IN								
Teachers	0.46 (0.05) ^{**}	0.35 (0.04) ^{**}	0.34 (0.05) ^{**}	0.55 (0.05) ^{**}	0.60 (0.04) ^{**}	0.40 (0.05) ^{**}	0.54 (0.04) ^{**}	***
Aides	0.45 (0.04) ^{**}	0.32 (0.04) ^{**}	0.33 (0.05) ^{**}	0.45 (0.04) ^{**}	0.58 (0.04) ^{**}	0.44 (0.05) ^{**}	0.53 (0.07) ^{**}	***

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

* $p < .05$.

** $p < .001$.

Longitudinal Regression of ADHD-HI, ODD, Anxiety, Depression, Academic Impairment, Social Impairment and Peer Rejection on Sluggish Cognitive Tempo and ADHD-IN

Table 6

Grade 3 Outcomes								
Grade 1 Predictors		ADHD-HI β (SE)	ODD β (SE)	ANX β (SE)	DEP β (SE)	AI β (SE)	SI β (SE)	PR β (SE)
SCT								
Teachers	**	-0.68 (0.12)	* -0.30 (0.10)	-0.18 (0.14) ^{ns}	0.14 (0.16) ^{ns}	0.14 (0.09) ^{ns}	0.14 (0.10) ^{ns}	* 0.16 (0.07)
Aides	**	-1.03 (0.21)	* -0.41 (0.15)	-0.24 (0.22) ^{ns}	-0.15 (0.15) ^{ns}	0.12 (0.16) ^{ns}	0.21 (0.20) ^{ns}	-0.16 (0.25) ^{ns}
ADHD-IN								
Teachers	**	0.91 (0.11)	** -0.54 (0.09)	* 0.38 (0.14)	* 0.27 (0.13)	** 0.50 (0.07)	** 0.32 (0.09)	** 0.38 (0.06)
Aides	**	1.24 (0.18)	** -0.59 (0.15)	* 0.42 (0.18)	** 0.55 (0.12)	* 0.42 (0.15)	* 0.53 (0.17)	* 0.65 (0.21)
Grade 2 Predictors								
SCT								
Teachers	**	-0.73 (0.10)	* -0.30 (0.09)	-0.06 (0.16) ^{ns}	* 0.31 (0.12)	* 0.25 (0.10)	0.01 (0.10) ^{ns}	0.16 (0.10) ^{ns}
Aides	**	-0.78 (0.12)	** -0.45 (0.09)	-0.06 (0.14) ^{ns}	0.19 (0.14) ^{ns}	0.27 (0.15) ⁺	0.11 (0.14) ^{ns}	-0.16 (0.13) ^{ns}
ADHD-IN								
Teachers	**	1.08 (0.11)	** 0.60 (0.09)	* 0.40 (0.15)	* 0.29 (0.11)	** 0.39 (0.08)	* 0.39 (0.09)	** 0.41 (0.10)
Aides	**	1.12 (0.13)	** 0.70 (0.10)	* 0.38 (0.14)	* 0.29 (0.12)	* 0.35 (0.13)	* 0.34 (0.13)	** 0.68 (0.12)

Note. The time interval between Time 1 and Time 4 was two years and between Time 3 and Time 4 one year. SCT = sluggish cognitive tempo; ADHD-IN = attention-deficit/hyperactivity disorder-inattention; ADHD-HI = hyperactivity/impulsivity; ODD = oppositional defiant disorder; ANX = anxiety; DEP = depression; AI = academic impairment; SI = social impairment; PR = peer rejection.

⁺ $p < 0.07$.

* $p < .05$.

** $p < .001$.