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Honing in on the Social Difficulties associated with Sluggish Cognitive Tempo in Children: Withdrawal, Peer Ignoring, and Low Engagement

Stephen P. Becker^{1,2,5}, Annie A. Garner³, Leanne Tamm^{1,2}, Tanya N. Antonini⁴, and Jeffery N. Epstein^{1,2}

¹Division of Behavioral Medicine and Clinical Psychology, Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio, USA

²Department of Pediatrics, University of Cincinnati College of Medicine, Cincinnati, Ohio, USA

³Department of Psychology, Saint Louis University, St. Louis, Missouri, USA

⁴TIRR Memorial Hermann, Houston, Texas, USA

Abstract

Objective—Sluggish cognitive tempo (SCT) symptoms are associated with social difficulties in children, though findings are mixed and many studies have used global measures of social impairment. The present study tested the hypothesis that SCT would be uniquely associated with aspects of social functioning characterized by withdrawal and isolation, whereas attention-deficit/hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD) symptoms would be uniquely associated with aspects of social functioning characterized by inappropriate responding in social situations and active peer exclusion.

Method—Participants were 158 children (70% boys) between ages 7–12 years being evaluated for possible ADHD. Both parents and teachers completed measures of SCT, ADHD, ODD, and internalizing (anxiety/depression) symptoms. Parents also completed ratings of social engagement and self-control. Teachers also completed measures assessing asociality and exclusion, as well as peer ignoring and dislike.

Results—In regression analyses controlling for demographic characteristics and other psychopathology symptoms, parent-reported SCT symptoms were significantly associated with lower social engagement (e.g., starting conversations, joining activities). Teacher-reported SCT symptoms were significantly associated with greater asociality/withdrawal and ratings of more frequent ignoring by peers, as well as greater exclusion. ODD symptoms and ADHD hyperactive-impulsive symptoms were more consistently associated with other aspects of social behavior, including peer exclusion, being disliked by peers, and poorer self-control during social situations.

Conclusions—Findings provide the clearest evidence to date that the social difficulties associated with SCT are primarily due to withdrawal, isolation, and low initiative in social

⁵Address correspondence to Stephen Becker, 3333 Burnet Ave., MLC 10006, Center for ADHD, Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio 45229. Phone: +1 513 803 2066. Fax: +1 513 803 0084. stephen.becker@cchmc.org.

situations. Social skills training interventions may be effective for children displaying elevated SCT symptomatology.

Keywords

ADHD; isolation; peers; sluggish cognitive tempo; social skills

Sluggish cognitive tempo (SCT) is characterized by behaviors such as daydreaming, mental confusion and foggiess, behavioral slowness/hypoactivity, and drowsiness/sleepiness (Becker & Barkley, in press; Becker et al., 2016). Though SCT symptoms were once considered potentially useful for identifying “purely” inattentive children with attention-deficit/hyperactivity disorder (ADHD), SCT appears to be distinct from ADHD inattention (Barkley, 2014; Becker, Marshall, & McBurnett, 2014). Indeed, bifactor modeling studies demonstrate that the SCT construct does not fall under the umbrella of either ADHD (Garner et al., 2014) or a general disruptive behavior factor (Lee et al., 2015). As such, research has turned toward investigating whether SCT uniquely predicts meaningful external constructs after controlling for ADHD symptoms, which are clearly associated with a wide range of functional impairments (Faraone et al., 2015).

A large body of literature demonstrates that peer relationships are a potent determinant of concurrent and long-term adjustment, both in youth with and without ADHD (Gardner & Gerdes, 2015; Parker et al., 2006). Several studies have sought to determine whether SCT is uniquely associated with social functioning. A recent meta-analysis demonstrated that SCT is bivariately correlated with social impairment in children and adolescents (Becker et al., 2016). However, examining individual studies and various methodological factors, the story is less clear. Many studies investigating SCT in relation to children’s social functioning have relied on broad measures of global social functioning. These studies have reported mixed findings, particularly when evaluating whether SCT remains associated with social impairment beyond ADHD symptoms. A number of studies have shown parent- or teacher-reported SCT to remain associated with greater social difficulties and impairment beyond ADHD (Becker, 2014; Becker & Langberg, 2013; Becker, Luebke, Fite, Stoppelbein, & Greening, 2014; Burns, Servera, Carrillo, & Cardo, 2013; Khadka, Burns, & Becker, 2016; Lee, Burns, Snell, & McBurnett, 2014), whereas others have not (Becker, Luebke, & Joyce, 2015; Belmar, Servera, Becker, & Burns, 2015). Still others have found that whether SCT remained associated with social impairment beyond ADHD symptoms varied based on whether parent or teachers were the informant. For instance, in a study of children from South Korea, SCT remained associated with greater social impairment beyond ADHD when teacher ratings were used, but not when parent ratings were used (Lee, Burns, & Becker, 2016b). Similarly, another study found teacher-rated SCT to be associated with poorer social skills, whereas parent-rated SCT was unassociated with social skills after controlling for ADHD symptoms (Bauermeister, Barkley, Bauermeister, Martinez, & McBurnett, 2012). Other studies have found the opposite. For example parent-rated SCT symptoms were associated with poorer social skills beyond ADHD and depressive symptoms, but teacher-rated SCT was unassociated with social skills when controlling for ADHD and depression (McBurnett et al., 2014). In a longitudinal study of Spanish children, parent-reported SCT symptoms, but not teacher-rated SCT symptoms, predicted later social impairment (Bernad,

Servera, Becker, & Burns, 2016). Fenollar Cortés and colleagues (2014) examined separate inconsistent alertness (e.g., daydreams, loses train of thought) and slowness (e.g., slow moving, seems drowsy) dimensions of SCT and found that the inconsistent alertness factor was uniquely associated with parent-rated peer problems above and beyond ADHD inattentive symptoms, whereas the SCT slowness factor was not. Lastly, two studies reported that SCT was either positively or unassociated with social impairment when parent ratings were used but associated with *less* social impairment when teacher ratings were used (Belmar et al., 2015; Watabe, Owens, Evans, & Brandt, 2014). In considering their findings, Watabe et al. (2014) hypothesized that SCT may be less noticeable or viewed as less problematic to teachers who have a large number of studies in their classroom at any given time and are more readily drawn to disruptive behaviors as compared to the more passive behaviors of SCT (though, see Burns et al., 2016, for some evidence in contrast to this hypothesis). Clearly, more research is needed to better understand the mixed findings across studies to date that have evaluated SCT in relation to social functioning.

What might account for these discrepant findings? As previously noted, the studies reviewed above relied on broad, often single-item measures of social functioning/impairment. Consequently, while a moderate-to-strong bivariate correlation was found between SCT and social impairment in a recent SCT meta-analysis (Becker et al., 2016), it was also noted that “future studies should increase the specificity used in examining various domains of impairment” (p. 172). There is some indication that SCT may be uniquely related to greater withdrawal and isolation. Two studies found that children diagnosed with ADHD Predominantly Inattentive Type (ADHD-IT) who also had high levels of SCT symptoms were more withdrawn than children with ADHD-IT who did not have elevated SCT (Carlson & Mann, 2002; Marshall et al., 2014). However, another study did not find higher rates of withdrawn behaviors in children with ADHD-IT who also had elevated SCT (Capdevila-Brophy et al., 2014). Nevertheless, another study of children with and without ADHD found that dimensional SCT symptoms remained associated with greater parent-rated social withdrawal and teacher-rated peer isolation, beyond ADHD symptoms (Willcutt et al., 2014). Lee et al. (2016a) similarly found evidence for SCT being associated with withdrawal specifically in a recent study of preschool-aged children. In a unique laboratory-based study, SCT symptoms were found to be associated with fewer responses made during a chat room task, as well as poorer perception of subtle social cues, even after controlling for ADHD status and intelligence (Mikami et al., 2007).

Taken together, findings from extant studies indicate that SCT symptoms may be uniquely associated with social impairment – and withdrawal and being ignored by peers specifically – but additional studies are needed. Several of the above studies used measures that included only 2–5 items for assessing SCT, reducing the reliability in the SCT measure (Becker et al., 2016). In addition, several studies only included parent *or* teacher ratings of SCT and/or social impairment, and as the findings reviewed above indicate, it is important to consider whether there are differences based on rater or whether social behaviors are rated in the home or school contexts. We are unaware of any study that has separately examined both parent and teacher ratings to evaluate whether SCT is uniquely associated with aspects of social functioning characterized by withdrawal and isolation.

The Present Study

The present study sought to define the specific social impairments associated with SCT. More specifically, we tested the hypothesis that SCT would be uniquely associated with aspects of social functioning characterized by withdrawal and isolation and unassociated with aspects of social functioning characterized by inappropriate responding in social situations and active peer exclusion, which were expected to be uniquely associated with symptoms of ADHD and oppositional defiant disorder (ODD). We evaluated this hypothesis using both parent and teacher ratings of both SCT and social functioning in a sample of children referred for an evaluation for possible ADHD. Moreover, whereas most studies examining SCT in relation to social functioning have only controlled for ADHD symptoms, it is clear that ODD symptoms are associated with poorer social functioning, and internalizing symptoms may also be associated with poorer social functioning and withdrawal specifically (Becker, Luebke, & Langberg, 2012). Therefore, as a rigorous test of the unique effect of SCT on social functioning, we controlled for child demographics as well as ADHD, ODD, and internalizing symptoms.

Methods

Participants

Participants were 158 children (110 boys) ages 7–12 years ($M=8.62$, $SD=1.59$) being evaluated for ADHD. Approximately three-quarters ($n = 123$, 77.8%) of the children were non-Hispanic White, and the remaining participants were African American ($n=27$; 17.1%), Hispanic ($n=5$; 3.2%), Asian ($n=2$; 1.3%), or Native American ($n=1$; 0.6%). All children had an IQ ≥ 80 ($M=103.72$, $SD=12.50$, $Range=80-142$) based on the *Kaufman Brief Intelligence Scale, Second Edition* (KBIT-2; (A. S. Kaufman & Kaufman, 2004).

In terms of *DSM-IV-TR* (American Psychiatric Association, 2000) psychiatric disorders, 138 (87.3%) met criteria for ADHD (Combine Type $n=74$, Predominantly Inattentive Type $n=57$, Predominantly Hyperactive-Impulsive Type $n=7$), 46 participants (29.1%) met criteria for ODD, 13 participants (8.2%) met criteria for at least one anxiety disorder, two participants (1.3%) met criteria for Major Depressive Disorder (both children with depression also met criteria for an anxiety disorder), and 1 participant (0.6%) met criteria for Conduct Disorder based on the *Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children* (K-SADS; (J. Kaufman et al., 1997) interview conducted with the child's caregiver. The majority of children ($n=144$; 91.1%) were not on psychotropic medications at the time of their evaluation; we decided to include children who are taking medication in order to increase generalizability of findings to typical ADHD samples where treatment with medication is common and because research indicates that medications do not normalize peer functioning (O'Connor, Garner, Peugh, Simon, & Epstein, 2015).

Procedures

This study was reviewed and approved by the Institutional Review Board. Families were recruited through the standard clinical intake flow at an outpatient clinic specializing in the diagnosis and treatment of ADHD. Families seeking an evaluation for ADHD who had

children ages 7–12 years were invited to participate. Parents provided informed consent and permission to collect teacher ratings; children provided assent. Seven teachers did not return rating scales.

Measures

SCT—The *Sluggish Cognitive Tempo Scale* (SCTS) (Penny, Waschbusch, Klein, Corkum, & Eskes, 2009) was completed by parents and teachers to assess children's SCT symptoms. The SCTS consists of 14 items rated on a four-point scale (0=*not at all*, 3=*very much*). Ten items from the SCTS were used as a measure of SCT in the present study and were selected based on findings from a recent meta-analysis of SCT items (Becker et al., 2016). Using items identified in the meta-analysis ensures that the items used for measuring SCT are not sample-specific but are instead considered optimal for assessing SCT across a range of sample types (i.e., clinical, community, and population-based studies) and raters (i.e., teachers, parents, child self-report, adult self-report). In addition, these 10 items were identified in the meta-analysis as consistently loading on a SCT factor and not cross-loading with ADHD inattention. The 10 items used to measure SCT in the present study are: (1) is apathetic; shows little interest in things or activities, (2) is unmotivated, (3) appears to be sluggish, (4) seems drowsy, (5) daydreams, (6), appears tired; lethargic, (7) gets lost in his or her own thoughts, (8) seems to be in a world of his or her own, (9) has a yawning, stretching, sleepy-eyed appearance, and (10) is underactive, slow moving, or lacks energy. In the present study, α s = .88 and .90 for parent- and teacher-rated SCT, respectively.

ADHD, ODD, and internalizing symptoms—ADHD, ODD, and internalizing (anxiety/depression) symptoms were assessed using the *Vanderbilt ADHD Diagnostic Parent Rating Scale* (VADPRS) and *Vanderbilt ADHD Diagnostic Teacher Rating Scale* (VADTRS) (Wolraich, Lambert, Baumgaertel, et al., 2003; Wolraich, Lambert, Doffing, et al., 2003). The Vanderbilt scales include all 9 inattentive and 9 hyperactive-impulsive *DSM-IV* ADHD symptoms, and also assess ODD (8 and 4 items for parent- and teacher-report, respectively) and internalizing symptoms (7 items for both raters). Parents and teachers rated symptom frequency on a four-point scale (0 = *never*, 3 = *very often*). Mean scores for the inattention (parent α =.88, teacher α =.93), hyperactivity-impulsivity (parent α =.91, teacher α =.94), ODD (parent α =.92, teacher α =.90), and internalizing scales (parent α =.88, teacher α =.87) were calculated.

Asociality and exclusion—The *Child Behavior Scale* (CBS) (Ladd & Profilet, 1996) is a validated teacher-report measure of child behaviors and relations with peers in the school setting. Teachers rate on a three-point scale how applicable the item is for the child (1 = *doesn't apply*, 2 = *applies sometimes*, 3 = *certainly applies*). The asocial with peers (withdrawn behavior) and excluded by peers subscales were used in the present investigation. The asocial subscale measures the degree to which a child chooses solitary rather than social activities in the peer context (6 items; e.g., “prefers to play alone”, “keeps peers at a distance”, “withdraws from peer activities”; α =.92). The exclusion scale measures peer-imposed rejection or isolation (7 items; e.g., “peers refuse to let child play with them”, “excluded from peers' activities”, “not chosen as a playmate by peers”; α =.92). Average

responses to items within each subscale were created with higher scores indicating greater asociality and exclusion.

Peer status—Teachers reported on children’s peer status using the *Dishion Social Acceptance Scale* (DSAS) (Dishion, 1990). Specifically, teachers rate the percentage of classmates who “dislike/reject” and “ignore” the child using a five-point scale from 1 (*almost none, less than 25%*) to 5 (*nearly all, over 75%*). This measure of social status has been well validated (Dishion, 1990), and scores have been shown to significantly correlate with peer sociometric nominations (Lee & Hinshaw, 2006). Higher ratings indicate greater levels of rejection and ignoring by the peer group as perceived by the teacher.

Social skills—Children’s social skills were assessed using the parent-report version of the *Social Skills Improvement System* (SSIS) (Gresham & Elliott, 2008). The SSIS is a well-validated measure of children’s social skills (Gresham & Elliott, 2008; Gresham, Elliott, Vance, & Cook, 2011). For the present study, the engagement and self-control subscales were selected to test the hypothesis that SCT would be related to poorer social skills in the engagement domain but not the self-control domain. Example items from the engagement subscale (7 items) are: “joins activities that have already started”, “starts conversations with peers”, and “introduces herself/himself to others”. Example items from the self-control subscale (7 items) are: “responds appropriately when pushed or hit”, “stays calm when disagreeing with others”, and “stays calm when teased”. For both subscales, higher scores indicate better social skills.

Statistical Analyses

First, bivariate correlations were conducted to examine the interrelations among the study variables. Second, regression analyses were conducted in Mplus Version 7.11 (Muthén & Muthén, 1998–2012) to test the primary study hypotheses that SCT symptoms would be uniquely related to withdrawn behaviors (i.e., greater asociality, more frequent ignoring from the peer group, and lower levels of social engagement) but not active peer exclusion or difficulties in self-control in social situations, beyond child demographics and other psychopathology symptoms. A regression analysis was used to simultaneously regress all of the outcome variables on all of the predictor variables. When multiple psychopathology domains were significantly associated with an outcome, the Mplus model constraint procedure was used to test the partial regression coefficients for significant differences. Regression analyses were conducted separately for parent and teacher ratings of psychopathology (i.e., SCT, ADHD-IN, ADHD-HI, ODD, internalizing). All six social functioning variables were included in both analyses, which allowed us to evaluate both within- and cross-rater effects. Teacher data was missing for 4.4% of the sample. Tests of patterns of missingness suggested data were missing completely at random (Little’s MCAR test: $\chi^2=36.69$, $df=45$, $p=.81$). Data for the regressions was handled via maximum likelihood parameter estimation (MLR) which is robust to non-normality (Muthén & Muthén, 1998–2012).

Results

Correlation Analyses

The descriptive statistics and intercorrelations among the study variables are provided in Table 1. Within both parent and teacher ratings, SCT symptoms were significantly, moderately-to-strongly associated with ADHD-IN symptoms ($p < .001$) but were unassociated with ADHD-HI symptoms ($p > .05$). As expected, parent-rated SCT symptoms were significantly associated with lower parent-rated social engagement scores ($p < .001$) but were unassociated with parent-rated self-control scores ($p = .11$). Also as expected, teacher-rated SCT symptoms were significantly correlated with greater teacher-rated asociality and “ignored” peer status ratings ($p < .001$) but were unassociated with teacher-rated “disliked” peer status ratings ($p = .95$). Unexpectedly, teacher-rated SCT was also significantly associated with greater teacher-rated peer exclusion ($p = .001$). In no instance were parent-rated SCT symptoms significantly correlated with teacher-rated social functioning, and vice versa (all $p > .05$).

Regression Analyses

Table 2 shows the unique effects (standardized partial regression coefficients) of the two regression analyses examining SCT, ADHD-IN, ADHD-HI, ODD, and internalizing symptoms in relation to social functioning domains. Findings were consistent with the bivariate analyses. That is, parent-rated SCT remained significantly associated with lower social engagement ($p = .02$), and teacher-rated SCT remained significantly associated with greater asociality ($p < .001$) and “ignored” peer status ratings ($p = .01$), even after controlling for child demographics and other psychopathology symptoms. SCT remained unassociated in the regression analyses with self-control skills, peer exclusion, and “disliked” ratings (all $p > .05$). Teacher-rated SCT remained significantly associated with greater teacher-rated exclusion ($p = .02$). As in the correlation analyses, no cross-rater effects were found for SCT in relation to social functioning.

Although ADHD-IN symptoms were associated with several social functioning domains in the bivariate correlation analyses, none of these associations remained significant in the regression analyses that included demographics and other psychopathology symptoms ($p > .05$). Parent-rated ODD symptoms were also uniquely associated with lower social engagement and lower self-control skills (both $p < .001$), in addition to *less* teacher-rated asociality ($p = .04$). Finally, parent-rated internalizing symptoms were uniquely associated with *lower* ratings for both “ignored” and “disliked” ($p = .04$ and $.03$, respectively), whereas teacher-rated internalizing symptoms were uniquely associated with both higher teacher-rated asociality and exclusion ($p = .02$ and $.03$, respectively; see Table 2). When multiple psychopathology dimensions were significantly uniquely associated with an outcome (e.g., teacher-rated SCT, ADHD-HI, ODD, and internalizing symptoms were each uniquely associated with teacher-rated exclusion), no differences were found in the magnitude of these significant partial regression coefficients for any of the outcome variables ($p > .05$).

Discussion

This study tested the hypothesis that SCT symptoms would be uniquely associated with social difficulties characterized by withdrawal and peer ignoring, and not social difficulties characterized by active peer rejection or inappropriate responding in social situations. We evaluated this hypothesis in a sample of children referred for an evaluation for possible ADHD, and rigorously controlled for ADHD dimensions as well as ODD and internalizing symptoms.

Findings supported the possibility that SCT symptoms are differentially associated with greater withdrawal and lower social engagement rather than peer dislike and poor self-control in social situations. Specifically, parent-rated SCT symptoms were significantly associated with lower social engagement (e.g., starting conversations, joining activities). In addition, teacher-rated SCT symptoms were significantly associated with greater asociality/withdrawal, as well as ratings of more frequent ignoring by peers (as well as greater peer exclusion, an unexpected finding discussed below). Of note, no cross-rater effects were found for SCT in relation to social functioning. Nevertheless, findings from this study provide the clearest evidence to date that the social difficulties associated with SCT are primarily due to withdrawal, isolation, and low initiative in social situations. Although no study has directly examined whether the withdrawal and isolation associated with SCT is due to shyness or social disinterest (Becker & Barkley, in press), it may be that SCT-related withdrawn behavior is related to avoidance of fear or discomfort in social situations given findings that SCT is associated with the fearfulness/shyness component of the Behavioral Inhibition System (BIS) (Becker et al., 2013). In addition, in a school-based sample of children, child-rated SCT symptoms were associated with increased loneliness (Becker et al., 2015), suggesting that withdrawn behavior is not due to a lack of interest in social engagement.

These findings related to loneliness and the BIS system, coupled with the findings from the present study, have important implications for intervention. Most clearly, social skills training has a limited impact on the social impairments of children with ADHD, particularly in terms of generalization beyond the treatment setting (Mikami, 2015). There are likely a number of reasons why learned skills often do not translate to real-life situations among children with ADHD (e.g., performance deficits rather than knowledge deficits, executive functioning deficits), but these deficits may not be present or as pronounced among children displaying SCT symptoms (Barkley, 2015; Becker & Barkley, in press). Indeed, social skills training interventions are most effective for children who are socially withdrawn, as opposed to socially disruptive/aggressive (DuPaul & Eckert, 1994), which further points to the possibility that social skills training may be of benefit to children with SCT (ironically, social skills training has also been referred to as social competence training [SCT]; Beelmann, Pfungsten, & Lösel, 1994). There is a clear need for studies that directly test the efficacy of social skills training for children who display elevated SCT symptomatology. Also, since 25–45% of children with ADHD also display elevated SCT symptoms (including a sizeable subset of children with ADHD-C; (Barkley, 2013; Carlson & Mann, 2002; Hinshaw, Carte, Sami, Treuting, & Zupan, 2002; Marshall et al., 2014), it will be critical to evaluate whether ADHD symptoms/status moderate the effectiveness of social skills training

for children with SCT. If research supports the effectiveness of social skills training for children with elevated SCT, evidence-based treatment guidelines may need to be updated to include the specific symptoms and associated social impairments that are most amendable to social skills-based training.

As expected, whereas SCT symptoms were most consistently related to greater social withdrawal and lower social engagement, ODD symptoms and, to a lesser extent, ADHD-HI symptoms were most consistently related to greater peer exclusion, more frequent peer dislike, and poorer self-control during social situations. As with SCT, these findings were limited to within-rater regression analyses with the only exception being that parent-rated ODD symptoms are associated with lower teacher-rated asociality. Of note, in no instance were ADHD-IN symptoms associated with social functioning in the regression analyses. In sum, SCT symptoms were associated with greater withdrawal and peer ignoring, ADHD-HI symptoms were associated with greater peer exclusion and dislike, and ADHD-IN symptoms were unassociated with social functioning. The one notable exception to this pattern was a significant unique effect of teacher-rated SCT in relation to teacher-rated exclusion, a finding in contrast to our study hypotheses. Interestingly, teacher-rated internalizing symptoms were also uniquely associated with teacher-rated peer exclusion. This finding, though unexpected, is in line with the possibility that some children experience both withdrawal and rejection (Parker et al., 2006), as well as children rating peers as withdrawn due to both passive withdrawal and active isolation (Younger & Daniels, 1992). For example, one of the items on the CBS peer exclusion subscale used in this study is “not chosen as a playmate by peers”, and while this is assumed to be due to peer-imposed rejection, it is possible that a child is not chosen because they have isolated themselves from the peer group. Thus, it is possible that teachers view a range of externalizing and internalizing behaviors (in the present study, SCT, ADHD-HI, ODD, and anxiety/depression symptoms) as each related to peer exclusion, or to different facets of exclusion, though additional studies are needed to further evaluate these possibilities. In any event, the general pattern of differential findings across SCT, ADHD-IN, and ADHD-HI symptom dimensions in relation to peer functioning provide further support for the distinction between SCT and ADHD.

The present findings should be considered in light of several limitations. First, our sample consisted of children referred for an ADHD evaluation, and the majority received a diagnosis of ADHD. It has been noted that the study of SCT needs to move beyond ADHD-defined samples in order to elucidate the unique impairments associated with SCT (Barkley, 2014; Becker & Barkley, in press), but it is nonetheless important to evaluate the impact of SCT in children with significant ADHD symptoms given the pervasive, long-lasting, and range of peer impairments experienced by children with ADHD as well as the overlap between ADHD and SCT symptoms (Barkley, 2013; Carlson & Mann, 2002). Moreover, our use of an ADHD-referred sample that included children who did and did not meet full diagnostic criteria for ADHD increased the range of ADHD symptomatology present in this sample, but future studies should broaden the sampling range even further to evaluate the association between SCT and peer functioning domains in non-ADHD-referred samples and other clinical samples. A second limitation is the lack of parallel measures across parents and teachers, which precluded direct comparisons across raters. Third, and relatedly, only

parent and teacher rating measures were used. Peer sociometric ratings/nominations are sometimes considered the gold standard for assessing social functioning in peer groups. Despite the benefits of peer sociometric ratings/nominations, this methodology is difficult to implement with clinical samples, as it is not generally feasible to obtain ratings from children's school peers as part of a clinical evaluation and teacher ratings offer a good alternative (La Greca, 1981; van den Berg, Lansu, & Cillessen, 2015). It would also be informative for future studies to include youth self-report of both their peer functioning and SCT symptoms (Becker et al., 2015; Smith et al., 2016). Finally, the cross-sectional design does not allow for drawing causal conclusions. There is emerging evidence that SCT is indeed prospectively associated with social difficulties (Becker, 2014; Bernad et al., 2016), though these studies have yet to examine transactional associations or social withdrawal specifically. Future studies can build from the current study in using a broad sampling strategy, multiple methods for assessing social adjustment, and a longitudinal design to better understand the interrelations of SCT and social withdrawal over time, as well as mechanisms underlying these associations that can be used to inform intervention efforts.

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Table 1

Means, Standard Deviations, and Intercorrelations of Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Sex	--																		
2. Race	-.02	--																	
3. Age	-.05	-.10	--																
4. PR SCT	-.07	-.01	.19*	--															
5. PR ADHD-IN	-.08	-.07	.002	<u>.39*</u>	--														
6. PR ADHD-HI	.17*	-.14	<u>-.27*</u>	-.12	<u>.34*</u>	--													
7. PR ODD	-.06	-.10	.10	.18*	<u>.40*</u>	<u>.38*</u>	--												
8. PR ANX/DEP	-.17*	.11	.13	<u>.48*</u>	<u>.27*</u>	-.10	<u>.42*</u>	--											
9. TR SCT	.05	-.13	.03	<u>.25*</u>	.17*	-.08	-.08	.11	--										
10. TR ADHD-IN	.18*	-.22*	-.10	.10	<u>.24*</u>	.11	-.05	-.01	<u>.51*</u>	--									
11. TR ADHD-HI	<u>.22*</u>	<u>-.26*</u>	<u>-.20*</u>	<u>-.21*</u>	<u>-.003</u>	<u>.38*</u>	-.02	<u>-.27*</u>	-.03	<u>.46*</u>	--								
12. TR ODD	.16	<u>-.37*</u>	.003	-.02	.12	<u>.25*</u>	.21*	-.15	.01	<u>.37*</u>	<u>.56*</u>	--							
13. TR ANX/DEP	-.14	-.16	.01	.06	.09	-.04	.08	<u>.22*</u>	<u>.24*</u>	.16	.04	<u>.28*</u>	--						
14. TR Asocial	.10	-.10	.01	.12	.11	-.03	-.14	-.04	<u>.45*</u>	<u>.27*</u>	.07	.16	<u>.32*</u>	--					
15. TR Exclusion	.08	-.23*	-.05	.05	.17*	.19*	.09	-.11	<u>.27*</u>	<u>.44*</u>	<u>.47*</u>	<u>.28*</u>	<u>.48*</u>	--					
16. TR "Disliked"	.16*	-.11	-.05	-.05	.08	<u>.25*</u>	<u>.25*</u>	-.10	.01	<u>.25*</u>	<u>.56*</u>	.10	.15	<u>.66*</u>	--				
17. TR "Ignored"	-.02	-.20*	.07	.12	.18*	.05	-.01	-.10	<u>.31*</u>	<u>.31*</u>	.18*	.17*	.11	<u>.43*</u>	<u>.67*</u>	<u>.42*</u>	--		
18. PR Engagement	.12	-.07	-.19*	<u>-.33*</u>	-.15	.003	<u>-.42*</u>	<u>-.38*</u>	-.10	.01	.14	-.05	-.04	-.12	-.08	-.13	-.12	--	
19. PR Self-Control	.07	.05	-.07	-.13	<u>-.29*</u>	<u>-.34*</u>	<u>-.72*</u>	<u>-.31*</u>	.04	-.05	-.02	-.15	-.04	.05	-.12	<u>-.23*</u>	-.03	<u>.48*</u>	--
<i>M</i>	--	--	8.62	0.69	2.17	1.66	1.23	0.85	1.06	1.92	1.08	0.54	0.49	1.41	1.58	1.70	1.96	13.34	8.99
<i>SD</i>	--	--	1.59	0.56	0.59	0.77	0.79	0.67	0.70	0.80	0.87	0.76	0.50	0.50	0.52	1.05	1.18	3.95	4.19

Note. $N = 158$. For correlations involving teacher ratings, $n = 151$. For sex, 0 = female, 1 = male. For race, 0 = non-White, 1 = White. ADHD = attention-deficit/hyperactivity disorder. ANX/DEP = anxiety/depression. IN = inattention. HI = hyperactivity/impulsivity. ODD = oppositional defiant disorder. PR = parent report. SCT = sluggish cognitive tempo. TR = teacher report. Correlations with an asterisk are statistically significant at $p < .05$. Correlations with an asterisk and italicized are statistically significant at $p < .01$. Correlations with an asterisk, italicized, and underlined are statistically significant at $p < .001$.

Standardized Unique Effects (Standard Errors) of Sluggish Cognitive Tempo and Other Psychopathology Symptoms on Social Functioning

Table 2

PARENT MODEL	Child Behavior Scale (TR)		Dishion Social Acceptance Scale (TR)		Social Skills Improvement System (PR)	
	Asocial	Exclusion	"Ignored"	"Disliked"	Engagement	Self-Control
Sex	0.11 (0.08)	0.04 (0.08)	-0.05 (0.09)	0.12 (0.08)	0.06 (0.06)	0.05 (0.06)
Race	-0.10 (0.08)	-0.19 (0.08)*	-0.15 (0.08)	-0.05 (0.08)	-0.10 (0.07)	-0.03 (0.06)
Age	-0.002 (0.08)	-0.04 (0.08)	0.07 (0.09)	-0.03 (0.08)	-0.09 (0.06)	-0.03 (0.05)
PR SCT	0.10 (0.09)	0.09 (0.10)	0.14 (0.10)	0.03 (0.09)	-0.23 (0.10)*	-0.004 (0.07)
PR ADHD-IN	0.17 (0.10)	0.11 (0.09)	0.18 (0.09)	-0.03 (0.09)	0.11 (0.07)	0.02 (0.06)
PR ADHD-HI	-0.03 (0.10)	0.09 (0.09)	0.01 (0.10)	0.09 (0.10)	0.03 (0.08)	-0.12 (0.08)
PR ODD	-0.21 (0.10)*	0.06 (0.11)	-0.04 (0.11)	0.30 (0.10)	-0.39 (0.09)***	-0.67 (0.06)***
PR ANX/DEP	-0.02 (0.09)	-0.16 (0.10)	-0.21 (0.09)*	-0.19 (0.09)*	-0.10 (0.11)	-0.03 (0.06)
TEACHER MODEL	Asocial	Exclusion	"Ignored"	"Disliked"	Engagement	Self-Control
Sex	0.21 (0.15)	-0.08 (0.15)	-0.20 (0.19)	0.06 (0.14)	0.23 (0.17)	0.13 (0.18)
Race	0.04 (0.19)	0.01 (0.21)	-0.21 (0.22)	0.31 (0.21)	-0.30 (0.18)	0.05 (0.20)
Age	0.002 (0.19)	0.01 (0.04)	0.06 (0.05)	0.02 (0.04)	-0.09 (0.06)	-0.02 (0.05)
TR SCT	0.57 (0.13)***	0.26 (0.11)*	0.34 (0.13)*	0.12 (0.10)	-0.17 (0.15)	0.13 (0.14)
TR ADHD-IN	-0.02 (0.13)	0.14 (0.11)	0.16 (0.12)	-0.14 (0.10)	0.01 (0.16)	-0.12 (0.15)
TR ADHD-HI	0.03 (0.11)	0.36 (0.11)**	0.15 (0.12)	0.54 (0.11)***	0.20 (0.12)	0.14 (0.13)
TR ODD	0.10 (0.14)	0.30 (0.14)*	0.04 (0.17)	0.42 (0.13)**	-0.29 (0.15)	-0.23 (0.14)
TR ANX/DEP	0.45 (0.19)*	0.29 (0.13)*	-0.004 (0.20)	0.05 (0.12)	0.09 (0.17)	0.07 (0.16)

Note. For sex, 0 = female, 1 = male. For race, 0 = non-White, 1 = White. ADHD = attention-deficit/hyperactivity disorder. ANX/DEP = anxiety/depression. HI = hyperactivity/impulsivity. IN = inattention. ODD = oppositional defiant disorder. PR = parent-report. SCT = sluggish cognitive tempo. TR = teacher-report

* $p < .05$.

** $p < .01$.

*** $p < .001$.