Published in final edited form as:

Clin Child Psychol Psychiatry. 2016 January ; 21(1): 81–94. doi:10.1177/1359104514554312.

Uncovering a Clinical Portrait of Sluggish Cognitive Tempo within an Evaluation for ADHD: A Case Study

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Abstract

Despite the burgeoning scientific literature examining the sluggish cognitive tempo (SCT) construct, very little is known about the clinical presentation of SCT. In clinical cases where SCT is suspected, it is critical to carefully assess not only for attention-deficit/hyperactivity disorder (ADHD) but also for other comorbidities that may account for the SCT-related behaviors, especially internalizing symptoms and sleep problems. The current case study provides a clinical description of SCT in a 7-year-old girl, offering a real-life portrait of SCT while also providing an opportunity to qualitatively differentiate between SCT and attention-deficit/hyperactivity disorder (ADHD), other psychopathologies (e.g., depression, anxiety), and potentially related domains of functioning (e.g., sleep, executive functioning). “Jessica” was described by herself, parents, and teacher as being much slower than her peers in completing schoolwork, despite standardized testing showing Jessica to have above average intelligence and academic achievement. Jessica’s parents completed rating scales indicating high levels of SCT symptoms and daytime sleepiness, as well as mildly elevated EF deficits. More research is needed to determine how to best conceptualize, assess, and treat SCT, and Jessica’s case underscores the importance of further work in this area.

Key terms

attention deficit disorder; attention-deficit/hyperactivity disorder; case report; comorbidity; concentration deficit disorder; sleep; slow cognitive tempo

To date, the *Diagnostic and Statistical Manual of Mental Disorders (DSM)* has classified the diagnosis currently termed attention-deficit/hyperactivity disorder (ADHD) into subtypes

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Financial Disclosure: The authors have no financial relationships relevant to this article to disclose.

Conflict of Interest: None.

based on the phenotypic presentation of inattentive and hyperactive/impulsive symptoms, with the most recent *DSM-5* nosology referring to Inattentive (ADHD-I), Hyperactive/Impulsive (ADHD-HI), and Combined (ADHD-C) Presentations (American Psychiatric Association [APA], 2013). These categories seem to accurately phenotype the majority of children diagnosed with ADHD. However, there are some children who display largely attentional problems but are qualitatively different than those with ADHD-I. While these children may display some cardinal ADHD inattentive symptoms, they are better characterized by their excessive daydreaming, mental confusion or seeming to be “in a fog,” drowsiness, and slowed behavior or thinking (see Becker, Marshall, & McBurnett, 2014; Barkley, 2014). The term “sluggish cognitive tempo” (SCT) was coined to describe this group of children (Carlson, 1986; Neeper & Lahey, 1986).

Although initial attempts to define the SCT phenotype suggested that children with SCT composed a subset of children with ADHD-I who display high rates of inattention but few hyperactive-impulsive symptoms (Carlson & Mann, 2002), research has not convincingly supported this hypothesis (Marshall et al., 2014; Willcutt et al., 2014). Rather, research has shifted to focus on SCT as a symptom cluster distinct from the ADHD symptom domains (Barkley, 2013; Becker, Langberg et al., 2014; Becker, Luebbe et al., 2014; Bernad et al., 2014; Garner et al., 2010, 2014; Hartman et al., 2014; Jacobson et al., 2012; Lee et al., 2014; McBurnett et al., 2014; Penny et al., 2009; Willcutt et al., 2014). Generally consistent findings supporting the internal validity of SCT as distinct from ADHD – coupled with findings supporting the external validity of SCT – have led some to argue (Barkley, 2014; Saxbe & Barkley, 2014) that SCT may be its own psychiatric disorder, separate from ADHD, with an estimated prevalence rate among youth of 5–6% (Barkley, 2013).

While research supports the notion that SCT is distinct from the ADHD symptom domains, it is also clear that SCT and ADHD frequently co-occur, with approximately 60% of youth with SCT also having clinically elevated ADHD symptoms (Barkley, 2013). Like ADHD, SCT is linked to poorer sustained attention (Wahlstedt & Bohlin, 2010; Willcutt et al., 2014) and difficulties with problem solving and self-organization (Barkley, 2013; Becker & Langberg, 2014). SCT is also associated with internalizing symptoms (Becker, Langberg, Luebbe, Dvorsky, & Flannery, 2014; Becker, Luebbe, Fite, Stoppelbein, & Greening, 2014; Garner, Marceaux, Mrug, Patterson, & Hodgins, 2010; Jacobson et al., 2012; Penny, Waschbusch, Klein, Corkum, & Eskes, 2009), and depressive symptoms especially (Barkley, 2013; Becker, Langberg et al., 2014; Becker, Luebbe et al., 2014; Bernad, Servera, Grases, Collado, & Burns, 2014; Cortés et al., in press; Jacobson et al., 2012). In contrast to ADHD, SCT is associated with *fewer* externalizing and aggressive behaviors (Becker, Luebbe et al., 2014; Bernad et al., 2014; Jacobson et al., 2012; McBurnett et al., 2014; Penny et al., 2009; Wahlstedt & Bohlin, 2010). In addition, SCT symptoms are associated with poorer psychosocial adjustment, including academic problems (Becker, Langberg et al., 2014; Langberg, Becker, & Dvorsky, 2014; Lee, Burns, Snell, & McBurnett, 2014), withdrawal (Carlson & Mann, 2002; Marshall et al., 2014; Willcutt et al., 2014), peer impairment (Becker, 2014), and emotion dysregulation (Flannery et al., 2014; Jiménez, Ballabriga, Martin, Arrufat, & Giacobbo, 2013). Since SCT is characterized by drowsiness and lethargy, it is not surprising that SCT is also associated with poor nighttime sleep

quality and daytime sleepiness (Becker, Luebke, & Langberg, 2014), although it is important to note that SCT and daytime sleepiness do not appear to be redundant constructs (Langberg, Becker, Dvorsky, & Luebke, 2014). Taken together, these research findings point to SCT as a potentially important domain of psychopathology in clinical child psychology and psychiatry.

Despite the burgeoning scientific literature examining SCT, little is known about its clinical presentation. Although important steps have recently been made in validating rating scale measures of SCT (Barkley, 2013; Lee et al., 2014; McBurnett et al., 2014; Penny et al., 2009), these measures do not themselves offer a clinically meaningful portrait of a child with SCT. In addition, although recent studies have empirically differentiated between ADHD and SCT, agreed-upon criteria for classifying SCT do not yet exist. Thus, the current case report provides a clinical description of SCT in a 7-year-old girl, offering a real-life portrait of SCT while also providing an opportunity to qualitatively differentiate between SCT and ADHD (and other psychopathologies such as depression and anxiety) and consider other potentially related domains of functioning (e.g., sleep, executive functioning [EF]).

Evaluation Procedures

“Jessica” was referred by her pediatrician for an ADHD evaluation at an ADHD specialty clinic within a tertiary pediatric medical center due to concerns about her inattention and school difficulties. The evaluation included diagnostic interviews conducted separately with Jessica and her parents, as well as parent and teacher versions of the *Vanderbilt ADHD Diagnostic Rating Scale* (VADRS; Wolraich et al., 2003) and the *Child Behavior Checklist/Teacher’s Report Form* (CBCL/TRF; Achenbach, 2001). In addition, Jessica and her parents completed several additional measures in order to contribute to a research-related clinical database. These additional measures included standardized intelligence and academic achievement tests as well as measures assessing SCT symptoms, sleep, and EF.

Evaluation Results

Demographics and Developmental/Medical History

Jessica is a non-Hispanic White 7-year-old female in the second grade. She lives with her biological parents and younger siblings. Her parents are married and have both obtained college degrees. The family receives Medicaid and food stamp assistance. There were no complications during pregnancy and Jessica was not prenatally exposed to alcohol, tobacco, or other drugs. Jessica was born at full term via Cesarean-section due to failure to progress through labor and was of normal birth weight. Early language and developmental milestones were met at the expected ages. Based on parent-report on the clinic’s developmental questionnaire as well as information gathered during the clinical interview, Jessica’s medical and psychiatric histories are non-contributory and she has not experienced any trauma, abuse, or other adverse life experiences. In regard to family history items included on the developmental questionnaire and confirmed during the clinical interview, Jessica has a first-degree relative who has been diagnosed with ADHD, depression, and anxiety in addition to several second-degree relatives with depression and/or alcohol abuse.

Jessica's parents report concerns with her apparent difficulties with inattention and slowed behavior, first noted when she was two years old. In particular, her parents describe Jessica as frequently taking a long time to get things done, including daily tasks or routines, primarily because of slowness rather than distractibility or oppositional behavior. They note that Jessica even seems "lost" and "dreamy" during play activities. These behaviors negatively impact Jessica and her family. For example, her parents started waking Jessica up an hour early because she takes so long to get ready for school. They also describe Jessica as struggling because the amount of schoolwork and homework has increased in second grade. Although Jessica has started to delay beginning homework, her parents note that she usually stays on task after she starts, albeit working very slowly. Her parents report that Jessica's homework should take 20–30 minutes to complete but often takes up to 3 hours, in part because she usually also has to do class assignments that she did not finish during the school day. When working, rather than carelessly skipping problems or making mistakes, Jessica gets "stuck" and has a hard time moving on to the next problem. Her parents report that Jessica struggles with writing due to challenges with getting her ideas onto paper, but note no other specific academic concerns. Jessica's parents also report that her slow task completion is worsened if she feels rushed or if they try to instill a "sense of urgency". Specifically, prompting or pushing leads to Jessica working even more slowly due to her concern that she will make mistakes. Likewise, her parents report that Jessica may worry or become frustrated about having difficulty getting tasks completed or done quickly, even though she generally does not worry about other things. Due to her homework challenges, Jessica sometimes has tantrums while doing homework, although her parents indicate no concerns with oppositional-defiant or conduct problems outside of homework time.

Intelligence and Academic Achievement

Jessica was administered the *Kaufman Brief Intelligence Test, Second Edition* (KBIT-2; Kaufman & Kaufman, 2004), a screening measure of intellectual functioning which provides standardized estimates of verbal IQ, nonverbal IQ, and an IQ composite score. Jessica's Verbal IQ estimate was 121 (92nd percentile), her Performance IQ estimate was 131 (98th percentile), and her IQ Composite was 130 (98th percentile). Of note, the test administrator observed that Jessica maintained good focus and attention throughout but moved through all testing items very slowly, often thinking for several minutes before responding. None of the KBIT-2 subtests are timed.

Academic achievement was assessed using the *Wechsler Individual Achievement Test, Third Edition* (WIAT-III; Wechsler, 2009) Word Reading, Pseudoword Decoding, Reading Comprehension, Spelling, and Numerical Operations subtests. Like the KBIT-2, these WIAT-III subtests are not timed. Jessica's scores on the WIAT-III were: Spelling = 118 (88th percentile); Word Reading = 122 (93rd percentile), Pseudoword Decoding = 122 (93rd percentile), Reading Comprehension = 136 (99th percentile), and Numerical Operations = 118 (88th percentile).

An examination of her Word Reading Speed and Pseudoword Decoding Speed (i.e., how far Jessica had progressed on these subtests after 30 seconds) indicates that her processing is slower than expected given her high intelligence (92nd percentile across subtests) and

academic achievement (88th percentile across subtests). In comparison to other second grade students, Jessica's Word Reading Speed raw score of 25 and Pseudoword Decoding Speed raw score of 15 were both 50th percentile.

Diagnostic Interview

Jessica's parents were administered the ADHD, disruptive behavior, mood, and anxiety disorder modules of the *Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children* (K-SADS; Kaufman et al., 1997), a semi-structured diagnostic interview of *DSM-IV* diagnoses. On the K-SADS, Jessica's parents endorsed 6 of the 9 *DSM-IV* inattention symptoms and 1 of the 9 *DSM-IV* hyperactive/impulsive symptoms (see Table 1). Her parents noted that Jessica's inattentive symptoms cause clinically significant impairment at home and in school, as well as minor impairment in the peer domain. No oppositional defiant disorder (ODD), conduct disorder (CD), anxiety disorder, or mood disorder symptoms were endorsed on the K-SADS at clinically significant levels.

ADHD and SCT Rating Scales

Jessica's mother and teacher completed the respective versions of the VADRS (Wolraich et al., 2003). As summarized in Table 1, Jessica's mother rated 5 of the 9 inattentive symptoms and just one hyperactive/impulsive symptom as occurring "often" or "very often". Combining across the VADRS rating scale and the K-SADS diagnostic interview, Jessica's parents endorsed 7 of the 9 *DSM-IV* inattentive symptoms. The only ODD or CD item endorsed by Jessica's mother on the VADRS was related to Jessica often losing her temper, although information gathered during the clinical interview indicated this was primarily due to frustration while trying to complete homework. The only anxiety or depression symptom endorsed on the VADRS was being afraid to try new things for fear of making mistakes. Jessica's mother rated her as functionally impaired in writing.

In contrast to her mother's ratings, Jessica's teacher did not endorse the presence of any ADHD inattentive or hyperactive-impulsive symptoms on the VADRS (see Table 1). However, Jessica's teacher did rate 6 of the 9 inattentive symptoms as occurring "occasionally," with all of these items endorsed by Jessica's mother as occurring to a clinically significant degree on the K-SADS or parent VADRS. Jessica's teacher did not endorse the presence of any ODD, CD, or internalizing symptoms or areas of functional impairment on the VADRS. However, despite not endorsing any functional impairment area on the VADRS, it should be noted that Jessica's teacher told her parents on several occasions that Jessica was taking far longer than her peers to complete classwork. As a result, Jessica was often kept in from recess to complete classwork. Jessica herself noted that on most days she did not finish classwork at the same time as her classmates, and she described being the only student in her class with a specific folder for unfinished classwork.

Jessica's mother also completed the *SCT Scale*, a 14-item measure of SCT symptoms validated in a nonclinical sample of school-aged children (Penny et al., 2009). The parent version of the *SCT Scale* is comprised of three factors: Slow (6 items), Sleepy (5 items), and Daydreamer (3 items). Items are rated on a four-point scale (0 = *not at all*, 1 = *just a little*, 2 = *pretty much*, 3 = *very much*), and a rating of 2 or 3 is used to indicate symptom presence.

Jessica's mother endorsed 2 of the 6 Slow ("slow or delayed in completing tasks," "needs extra time for assignments"), 3 of the 5 Sleepy ("appears to be sluggish," "seems drowsy," "appears tired/lethargic"), and all 3 Daydreamer ("daydreams," "gets lost in her own thoughts," "seems to be in a world of her own") items as occurring to a clinically significant degree. Figure 1 displays Jessica's mean scale scores on the *SCT Scale* in comparison to the validation sample mean scores. As shown, Jessica's scores were 1 standard deviation (SD) above the validation sample mean on each of the SCT subscales and the SCT total score. Specifically, her score was 1.25 SD above the mean on the Slow scale, 2.67 SD above the mean on the Daydreamer scale, and 2.98 SD above the mean on the Sluggish scale, resulting in a total SCT score 2.42 SD above the mean.

Broadband Rating Scales

Jessica's mother and teacher completed the CBCL and TRF (Achenbach, 2001), respectively (see Table 2). Her mother's ratings showed clinical elevations on the Internalizing Composite and Total Competence domains, as well as the Attention Problems, Anxious/Depressed, and Aggressive Behavior syndrome scales. The parent CBCL SCT scale (comprised of 4 items: "confused or seems to be in a fog," "daydreams or gets lost in his/her thoughts," "stares blankly," and "underactive, slow moving, or lacks energy") was in the borderline range (96th percentile). Consistent with her teacher's ratings on the VADRS, Jessica did not obtain any scores in the clinical or borderline range on the TRF. Her highest TRF ratings were on the SCT and Attention Problems scales, both of which were at the 65th percentile.

Sleep Functioning

Jessica's mother's ratings on the *Children's Sleep Habits Questionnaire* (CSHQ; Owens, Spirito, & McGuinn, 2000) were within one standard deviation (SD) of the mean of the community pediatric sample used to validate the measure, with the exception of the Sleep Duration subscale (indicating a somewhat shorter sleep duration for Jessica at 1.71 SD above the mean) and the Daytime Sleepiness subscale (2.63 SD above the mean).

Executive Functioning

Finally, Jessica's mother completed the *Barkley Deficits in Executive Functioning Scale—Children and Adolescents* (BDEFS-CA; Barkley, 2012), a rating scale of EF in daily life. Ratings on this scale resulted in the following sex- and age-based percentile scores for Jessica: Self-Management to Time (94th percentile; mildly deficient per the BDEFS-CA scoring guidelines), Self-Regulation of Emotion (87th percentile; borderline or somewhat deficient); Self-Motivation (85th percentile; borderline or somewhat deficient); Self-Restraint (80th percentile; marginal clinical significance); and Self-Organization and Problem-Solving (72nd percentile; not clinically significant). Jessica's EF Summary and ADHD-EF Index scores were at the 87th and 89th percentile, respectively.

Discussion

This case study contributes to our understanding of SCT by offering a clinical portrait of SCT while also highlighting some of the key diagnostic challenges that clinicians face when

SCT is suspected. Many of these challenges relate to differential diagnosis with ADHD, internalizing disorders, and sleep problems (and daytime sleepiness in particular). Below, we describe why we believe Jessica's problems are related to SCT and then briefly consider whether other diagnoses might better explain her current difficulties. We conclude by offering a set of assessment and treatment recommendations for Jessica's case as well as directions for future research.

The Case for SCT

First, it is important to note that testing results indicated Jessica to have above average intelligence and academic achievement, indicating that the SCT symptoms are not due to an intellectual disability or learning disorder. Jessica's parents report a number of *DSM*-based ADHD Inattentive symptoms. However, it was clear throughout the evaluation that ADHD symptoms alone did not fully capture Jessica's difficulties. In particular, Jessica, her parents, and her teacher each noted that Jessica takes much longer than her peers to complete classwork and homework, particularly what would be expected given her high intelligence and academic achievement. Children with ADHD may also take a long time to complete tasks and assignments, but this is usually due to becoming distracted. In Jessica's case, however, once she starts her homework, she typically stays on task and persists until it is completed. In addition, children with ADHD often carelessly skip homework problems, whereas Jessica tends to get "stuck" and has a hard time moving on to the next problem. Moreover, when Jessica does become frustrated while working on schoolwork, it is typically not because of how difficult the material is but rather because of how long it takes her to complete it. Hence, it appears that Jessica's slowness in completing a wide range of tasks and daily life activities is leading to much of her impairment.

Comorbidity and Differential Diagnosis

Jessica does not meet full diagnostic criteria for any of the three primary subtypes/presentations of ADHD since her teacher did not endorse any ADHD symptoms or any domains of functional impairment on the VADRS, and current diagnostic criteria for ADHD require "several" symptoms to be evident across multiple settings (APA, 2013). This is likely due to Jessica having a very high IQ and academic achievement in tandem with the absence of disruptive behaviors, allowing Jessica to often succeed in the classroom setting despite having significant attentional difficulties as reported by her parents. Instead, Jessica may meet criteria for *DSM-5* Other Specified ADHD (ADHD Not Otherwise Specified in *DSM-IV*), which applies to children who have significant attentional difficulties (as Jessica does in the home setting) but do not meet full ADHD diagnostic criteria. It is not surprising that Jessica displays ADHD symptoms in addition to SCT, since it is estimated that 60% of children with elevated SCT also display significant ADHD symptoms (Barkley, 2013).

In addition to the co-occurrence of SCT and ADHD, multiple studies show SCT to be associated with internalizing symptoms broadly (Becker, Langberg, Luebke, Dvorsky, & Flannery, 2014; Becker, Luebke, Fite, Stoppelbein, & Greening, 2014; Garner et al., 2010; Jacobson et al., 2012; Penny et al., 2009), and depression in particular (Barkley, 2013; Becker, Langberg et al., 2014; Becker, Luebke et al., 2014; Bernad et al., 2014; Cortés et al., in press; Jacobson et al., 2012). In the case of Jessica, her parents' ratings on the CBCL

resulted in elevations on the broadband internalizing scale and anxious/depressed syndrome scale, but her parents did not endorse any clinically significant anxious or depressive symptoms on the K-SADS. Thus, Jessica did not meet criteria for any internalizing disorder at the time of this evaluation, but she is likely at risk for such problems, especially if she continues to experience peer and academic difficulties.

Since the SCT phenotype includes symptoms of sleepiness and being overtired, co-occurring SCT and daytime sleepiness is common (Langberg, Becker et al., 2014). Recent studies of adults indicate SCT and daytime sleepiness to be distinct but also related, as 73% of adults with elevated SCT have elevated daytime sleepiness (Langberg, Becker et al., 2014). Jessica has increased daytime sleepiness per her mothers' responses on the sleep functioning measure. Unfortunately, studies have yet to examine SCT in relation to objective measures of sleep functioning such as polysomnography (PSG), actigraphy, and the multiple sleep latency test (MSLT), so it is unclear if SCT serves as a proxy or is associated with increased risk for narcolepsy or other hypersomnias. Nonetheless, it is important to note that Jessica not only had an elevated score on the SCT Sleepy subscale (which most clearly corresponds to daytime sleepiness) but also had elevations on the other two SCT subscales assessing Slow and Daydreaming behaviors (see Figure 1). This suggests that Jessica's SCT behaviors and related impairments are not fully attributable to daytime sleepiness.

Assessment, Diagnosis, and Treatment

There are not currently agreed-upon symptoms or diagnostic criteria for assessing or identifying SCT (see Becker, 2014, for a review). Although a core symptom set of SCT symptoms has yet to be established, it is increasingly clear that SCT may be multidimensional in nature (at least in children) and consists of both a cognitive component (e.g., daydreaming, mental confusion, seeming to be "in a fog") and a behavioral component (e.g., slow moving, sluggish, appears drowsy/sleepy). This appears to parallel the two inattentive and hyperactive-impulsive dimensions that characterize *DSM*-based ADHD. Since both of these SCT components have been identified across several factor analytic studies (e.g., Barkley, 2013; Cortés et al., in press; McBurnett et al., 2014; Penny et al., 2009), it would seem ideal for both dimensions to be represented as investigators seek to establish a core set of SCT symptoms that can be used consistently across studies. In addition, whereas the diagnosis of ADHD requires symptoms to be present in multiple settings, no studies have evaluated whether cross-setting symptoms or impairment are important for SCT. Future research is needed to address this issue (e.g., advances in understanding the etiology of SCT would speak to whether cross-sectional symptoms/impairment would be expected), but it seems reasonable to expect that symptoms of SCT would be present at least to some degree across settings. When SCT is suspected, it is also critical to carefully assess not only for ADHD but also for other comorbidities that may account for the SCT-related behaviors, namely, internalizing symptoms and sleep problems. We were able to evaluate each of these in the case of Jessica, although it would have been beneficial to also use a diagnostic interview for evaluating SCT that has been developed to specifically assist with ruling-out internalizing or sleep problems as explanations for SCT (McBurnett, 2010).

Ultimately, our evaluation resulted in Jessica being given a diagnosis of Other Specified ADHD with clinically significant features of SCT. Given the dearth of SCT treatment research, interventions for ADHD-I were recommended to Jessica's parents, with a particular focus on academic interventions that seemed especially important for addressing Jessica's impairments. For instance, Jessica's parents were encouraged to break homework into multiple, shorter sessions (as opposed to a single, prolonged session) in order to reduce both Jessica's and her parents' frustration with slow homework completion. In addition, it was recommended that her teacher not withhold Jessica's recess when classwork was incomplete but consider shortening her assignments, particularly given Jessica's high intelligence and academic achievement coupled with the importance of Jessica developing and maintaining positive peer relationships. It was likewise recommended that Jessica be given extended time on tests. Although extended time may not be helpful for children with ADHD due to increased delay in task completion, Jessica's difficulties are primarily slow task completion despite her persistence.

Although no interventions have been specifically designed for SCT, preliminary evidence suggests that some evidence-based ADHD interventions may also reduce SCT symptoms. These interventions include a psychosocial intervention designed for children with the ADHD-I presentation who may also display SCT symptoms and have a slow processing speed (Piffner et al., 2007) and medication treatment with atomoxetine (Wietecha et al., 2013). It should be noted that both of these interventions were implemented with youth first diagnosed with ADHD, leaving it unclear how to best treat youth for whom SCT symptoms are the primary concern. Also, other evidence-based ADHD treatments, such as methylphenidate, have not yet been evaluated for efficacy at treating SCT. Since SCT appears to align more closely with the internalizing rather than externalizing spectrum of psychopathology (Becker, Fite et al., 2013), cognitive-behavioral therapy (CBT) or treatment with medications shown to be effective for internalizing disorders may be effective treatments for SCT (see Barkley, 2014; Becker, Fite et al., 2013) but these possibilities have not been tested.

Finally, it should be noted that, consistent with previous empirical research, this case study has conceptualized SCT as a psychopathology, but it of course remains to be seen if SCT is ultimately best considered as a distinct psychiatric disorder. Studies should continue to investigate this as well as other intriguing possibilities that have yet to receive empirical attention. For example, as noted by Becker, Marshall, and McBurnett (2014), "although highly speculative at this point in time, it is interesting to consider whether SCT may be useful as a transdiagnostic construct as opposed to a disorder per se, much like emotion regulation is not itself a disorder but is nonetheless critically important for understanding psychopathology across the life span" (p. 5). It is clear that much more research is needed to determine how to best conceptualize, assess, and treat SCT, and the case of Jessica underscores the importance of further work in this area.

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Figure 1. Jessica's sluggish cognitive tempo (SCT) scores in relation to the SCT measure (Penny et al., 2009) validation sample mean (+1SD).

Table 1**ADHD Symptom Endorsement by Jessica's Mother and Teacher**

<i>ADHD Inattentive items</i>	K-SADS	Parent VADRS	Teacher VADRS
1. Does not pay attention to details or makes careless mistakes	-	✓	-
2. Has difficulty keeping attention to what needs to be done	✓	✓	-
3. Does not seem to listen when spoken to directly	✓	-	-
4. Does not follow through when given directions and fails to finish activities	✓	-	-
5. Has difficulty organizing tasks or activities	✓	✓	-
6. Avoids, dislikes, or does not want to start tasks that require ongoing mental efforts	✓	✓	-
7. Loses things necessary for tasks or activities	-	-	-
8. Is easily distracted by noises or other stimuli	✓	✓	-
9. Is forgetful in daily activities	-	-	-
Sum of Inattentive Symptoms Endorsed	6	5	0
<i>ADHD Hyperactive-Impulsive Symptoms</i>			
1. Fidgets with hands or feet or squirms in seat	-	-	-
2. Leaves seat when remaining seated is expected	✓	-	-
3. Runs about or climbs too much when remaining seated is expected	-	-	-
4. Has difficulty playing or beginning quiet play activities	-	-	-
5. Is "on the go" or often acts as if "driven by a motor"	-	-	-
6. Talks too much	-	-	-
7. Blurts out answers before questions have been completed	-	-	-
8. Has difficulty waiting his/her turn	-	-	-
9. Interrupts or intrudes in others' conversations and/or activities	-	✓	-
Sum of Hyperactive-Impulsive Symptoms Endorsed	1	1	0

Note. ADHD = attention-deficit/hyperactivity disorder. K-SADS = *Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children*. VADRS = *Vanderbilt ADHD Diagnostic Rating Scale*.

Table 2

Jessica's Child Behavior Checklist (CBCL) and Teacher's Report Form (TRF) Scores

	CBCL		TRF	
	<i>T</i> -score	Percentile	<i>T</i> -score	Percentile
Total Symptoms Composite	64 [‡]	92	50	50
Externalizing Composite	64 [‡]	92	43	24
Rule-Breaking Behavior	59	81	50	50
Aggressive Behavior	65 [‡]	93	50	50
Internalizing Composite	65 [‡]	93	37	10
Anxious/Depressed	70 [‡]	>97	50	50
Withdrawn/Depressed	56	73	50	50
Somatic Complaints	57	76	50	50
Sluggish Cognitive Tempo (SCT)	67 [‡]	96	54	65
Attention Problems	73 [‡]	>97	54	65
Social Problems	62	89	50	50
Thought Problems	54	65	50	50
Obsessive-Compulsive Problems	63	90	50	50
Post-traumatic Stress Problems	63	90	51	54
Total Competence	36 [‡]	8	--	--
Activities	45	31	--	--
Social	32 [‡]	4	--	--
School	46	34	--	--
Adaptive Functioning Composite	--	--	50	50
Academic Performance	--	--	52	58

Note.

[‡]Domain in the clinical range.[†]Domain in the borderline or "at risk" range. Ratings for all other scales resulted in scores in the normal range.