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Identification of sluggish cognitive tempo by pre-service teachers

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IDENTIFICATION OF SLUGGISH COGNITIVE TEMPO BY PRE-SERVICE TEACHERS

An Abstract of a Thesis

Submitted

in Partial Fulfillment

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Rachel Elizabeth Meisinger

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ABSTRACT

Current research suggests that Sluggish Cognitive Tempo (SCT) is a distinct attentional disorder from Attention-Deficit/Hyperactivity Disorder (ADHD) that is characterized by a hypoactive, sluggish behavior pattern (Barkley, 2014). Further, unlike ADHD, SCT represents a more passive form of inattention that does not overly disrupt classroom learning goals. Thus children with SCT may be 'falling through the cracks' in schools. If children with SCT are going unrecognized in the classroom, they are likely not getting referred for treatment and additional educational services. SCT is related to many internalizing, academic, and social difficulties (Becker & Langberg, 2013, 2014) and early identification and intervention is crucial to maximize the child's social, emotional, and cognitive development. Therefore, the purpose of the current study was to bring attention to an understudied topic and to identify whether children with SCT are going unrecognized in the classroom. Specifically, this project examined pre-service teachers' knowledge and perceptions of SCT. Undergraduate education majors read vignettes describing three fictitious boys presenting with symptoms of SCT, a common externalizing disorder (ADHD), and a common internalizing disorder (Social Anxiety Disorder; SA) and rated each of the three vignettes in terms of their concern for the boy described. Results were analyzed using a series of repeated measures ANOVAs and logistic and linear regressions. Pre-service teachers viewed all three sets of symptoms as concerning, but viewed the ADHD behaviors as the most problematic. These results are promising, as they suggest that pre-service teachers are concerned about both hyperactive

behavioral problems in childhood (i.e., ADHD) and non-hyperactive behavioral problems (i.e., SCT and SA). However, pre-service teachers indicated they would be the most likely to refer the child with SA to a school psychologist. These results highlight the need to better educate pre-service teachers about childhood psychopathology to ensure that all children experiencing mental health problems are receiving the necessary services to succeed in school. This is especially important for less common disorders as well as newer symptom clusters, such as SCT. Implications for how best to identify SCT and future directions are discussed.

Keywords: Sluggish Cognitive Tempo (SCT), Attention Deficit Hyperactivity Disorder (ADHD), Social Anxiety Disorder, school-based mental health, pre-service teachers

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TABLE OF CONTENTS

PAGE

CHAPTER 1

INTRODUCTION

Several disorders in the *Diagnostic Statistical Manual – 5th Edition (DSM-5*; American Psychiatric Association [APA], 2013) begin in childhood. Problem behavior in childhood is associated with a variety of negative outcomes in later life, including an increased risk for the development of internalizing and externalizing problems (Lochman & Conduct Problems Prevention Research Group, 1995). Early detection and intervention can help interrupt this negative trajectory before these behavior patterns become overlearned and automatic (Conduct Problems Prevention Research Group, 1992). Early intervention helps prevent mental health problems from worsening and also results in a less disabling course of the disorder (Norman & Malla, 2001). However, without appropriate intervention, childhood disorders often increase in severity and continue into adulthood, resulting in negative life outcomes such as school failure, poor employment opportunities, and poverty in adulthood (National Advisory Mental Health Council Workgroup on Child and Adolescent Mental Health Intervention Development and Deployment, 2001).

An important component to early intervention is the ability to recognize and identify a child with a mental health problem. Although most children have routine visits with their pediatrician, these visits tend to be brief and often lack a discussion of behavioral concerns (Glascoe, 2005; Huffman & Nichols, 2004). In fact, many parents have indicated that their child's pediatrician did not recognize symptoms of mental illness in their children; less than half of the children with developmental disabilities and mental

health problems are identified and evaluated prior to entering school (King & Glascoe, 2003; Halfon et al., 2004). Even when mental illness is identified in a primary care setting, it is not always adequately treated (Young, Klap, Sherbourne, & Wells, 2001; Wang, Demler, & Kessler, 2002).

Thus, it has been suggested that teachers may be in a better position to identify mental health problems in childhood (Herbert, Crittenden, & Dalrymple, 2004; Loe & Feldman, 2007; Snider, Busch, & Arrowood, 2003). Teachers are exposed to large normative samples of children, giving them the unique ability to identify children who deviate from the typical pattern of child behavior. Indeed, teachers are often the initial referral source, recommending to parents that their child be evaluated for mental and/or behavioral problems (Snider et al., 2003). However, research suggests that teachers may not be as well-informed about childhood disorders as they believe (Anderson, Watt, Noble, & Shanley, 2012; Bekle, 2004; Herbert et al., 2004; Kos, Richdale, & Jackson, 2004; Pilling, 2000; Sciutto, Terjesen, & Bender Frank, 2000; Snider et al., 2003). This gap in knowledge is likely because teachers are not adequately trained to identify mental health disorders in children (Anderson et al., 2012; Bekle, 2004; Herbert et al., 2004; Kos et al., 2004; Sciutto et al., 2000). This knowledge gap has several implications in terms of whether or not children are getting appropriate referrals for testing and services. Of particular concern are lesser-known childhood conditions, as these conditions are even less likely to be identified. One such condition is Sluggish Cognitive Tempo (SCT); a set of symptoms that has been linked to ADHD in the past, but is not officially recognized by the *DSM-5*.

SCT is a relatively new and understudied cluster of symptoms in the field of child psychopathology, defined by a hypoactive, sluggish behavior pattern (Barkley, 2014). Until recently, SCT has mainly been studied in tandem with ADHD (see Becker, Marshall, & McBurnett, 2014, for an historical overview of Sluggish Cognitive Tempo). SCT appears to have several overlapping features with ADHD-Predominantly Inattentive Type (ADHD/IA); however the research suggests that the two are actually separate disorders that are often comorbid (Barkley 2013a, 2013b, 2014; Bauermeister, Barkley, Bauermeister, Martinez, & McBurnett, 2012; Becker & Langberg, 2013; Becker, Fite, Garner, Greening, Stoppelbein, & Luebbe, 2013; Becker, Luebbe, Fite, Stoppelbein, & Greening, 2014; Becker, Marshall, et al., 2014; Garner, Marceaux, Mrug, Patterson, & Hodgens, 2010; Lee, Burns, Snell, & McBurnett, 2014; Moruzzi, Rijsdijk, & Battaglia, 2014; Willcut et al., 2014). Children with SCT exhibit impairment in both social and academic functioning (Jacobson et al., 2012; Langberg, Becker & Dvorsky, 2014; Lee et al., 2014; Marshall, Evans, Eiraldi, Becker & Power, 2014; Mikami, Huang-Pollock, Pfiffner, McBurnett, & Hangai, 2007; Watabe, Owens, Evans, & Brandt, 2014). The core symptoms of SCT present quite differently than the symptoms of ADHD (Barkley, 2013a, 2014), and it is possible that SCT symptoms may go unrecognized in the classroom and children with these symptoms do not receive early intervention. Since SCT is mainly studied in tandem with ADHD, an overview of ADHD and its relation to SCT will be discussed first. Then the role of teachers in childhood mental health identification, and more specifically the identification of SCT by teachers will be discussed.

CHAPTER 2

LITERATURE REVIEW

Attention-Deficit/Hyperactivity Disorder

ADHD is one of the most common disorders of childhood, affecting approximately 5% of children in the United States (APA, 2013). This disorder is characterized by a pattern of inattention and/or hyperactive and impulsive behavior that is not developmentally appropriate. Subtyping of ADHD is currently based on whether the individual presents high levels of inattention (Predominantly Inattentive Type; ADHD/IA), high levels of hyperactive/impulsive symptoms (Predominantly Hyperactive-Impulsive Type; ADHD/HI), or both (Combined Type; ADHD/C; APA, 2013). Each symptom cluster consists of nine symptoms, and a child must present with at least six symptoms from one cluster for a diagnosis of ADHD/IA or ADHD/HI, or six symptoms in both clusters for a diagnosis of ADHD/C. Individuals with symptoms of inattention have difficulty sustaining focus, lack persistence, and are disorganized (APA, 2013). Inattentive symptoms are more strongly related to internalizing problems such as anxiety (Milich, Balentine, & Lynam, 2001) and are also linked to greater impairment in academic functioning (Watabe et al., 2014). Hyperactive/impulsive symptoms include excessive motor activity, fidgeting, tapping, and talkativeness and hasty actions that occur without forethought (APA, 2013). Symptoms of hyperactivity and impulsivity are more strongly related to externalizing problems such as oppositionality (Carlson & Mann, 2002; Milich et al., 2001) and result in greater peer rejection and accidental injury (APA, 2013).

ADHD is a chronic condition that often persists into adulthood, causing impairment in many major life activities (APA, 2013). Academic problems associated with ADHD are persistent and begin early in life. For example, children with ADHD are at risk for underachievement, grade failure, lower standardized achievement test scores, and school drop-out (Loe & Feldman, 2007; Marshall et al., 2014). Further, children with ADHD have profound social difficulties, likely due to a lack of knowledge of appropriate social behavior (Mikami, 2010; Stormont, 2001). They have difficulty developing and maintaining friendships, and are often rejected and disliked by their peers (Marshall et al., 2014; Mikami, 2010). Often times, ADHD symptoms are first noticed by a child's teacher during the elementary school years. When children enter school, they are instructed to engage in tasks and activities such as sitting still and following instructions. These types of tasks and activities are very difficult for individuals with ADHD and teachers are in a position to notice these maladaptive behaviors (Anderson et al., 2012; Barkley, 1998; Jacobson et al., 2012; Kos et al., 2004; Scuitto et al., 2000).

Sluggish Cognitive Tempo

The idea of a cluster of symptoms related to mental sluggishness and underarousal has existed for centuries, and more recently has been studied in tandem with ADHD (see Becker, Marshall, et al., 2014 for an historical overview of Sluggish Cognitive Tempo). The term "sluggish tempo" was first coined to describe a subset of children with ADHD who exhibited symptoms such as daydreaming, mental confusion, easily distracted, poor processing of information, lethargy, and hypoactivity (Carlson, 1986; Lahey, Schaughency, Strauss, & Frame, 1984). The children described in these early accounts

presented with symptoms of attention deficits and impulsivity, but without hyperactivity. Rather, these children were characterized by a hypoactive, sluggish behavior pattern that did not fully fit the past conceptualization of ADHD. This sluggish tempo symptom cluster has historically been understudied, likely because it presents a challenge to the traditional view of ADHD. The sluggish tempo symptoms related to a lack of initiative, underarousal, and low levels of mental energy likely encompass attentional problems that are not currently captured by the inattentive symptoms of ADHD.

Interest in this topic has surged recently, perhaps due to the fact that many researchers now view sluggish tempo as a symptom cluster that exists independent of ADHD (Barkley 2013a, 2013b, 2014; Bauermeister et al., 2012; Becker et al., 2013; Becker & Langberg, 2013, 2014; Becker, Luebbe, Fite, et al., 2014; Becker, Marshall, et al., 2014; Garner et al., 2010; Lee et al., 2014; Moruzzi et al., 2014; Willcut et al., 2014). In fact, in the last decade there have been numerous studies of Sluggish Cognitive Tempo (SCT) with and without a relation to ADHD. Today, SCT is defined by the following behavioral characteristics: daydreaming, sluggishness, drowsiness, difficulty sustaining attention, mental confusion, spacey or "in a fog," lethargy, withdrawal, forgetfulness, hypoactivity, slow processing speed, difficulty staying awake or alert, and being slow to complete tasks (Barkley, 2013b). Barkley (2014) has identified SCT as having two dimensions: a cognitive-inattentive dimension (e.g., gets lost in own thoughts, daydreams, slow or delayed in completing tasks) and a motor-behavioral dimension (e.g., appears to be sluggish, appears to be lethargic, is underactive, lacks energy). Both of

these dimensions are related to ADHD inattentive symptoms, but are more highly correlated with each other than with either ADHD symptom cluster (Barkley, 2013a).

Internalizing and Externalizing Correlates

In addition to being related to inattention, SCT is also related to internalizing difficulties above and beyond those commonly associated with ADHD (Bauermeister et al., 2012; Becker & Langberg, 2014; Carlson & Mann, 2002; Shirbekk, Hansen, Oerbeck, & Kristensen, 2011). For example, children with SCT have been shown to struggle with increased withdrawal, somatization, anxious and depressed behavior, and impaired social functioning (Becker & Langberg, 2014; Carlson & Mann; 2002; Shirbekk et al., 2011). However, these children also demonstrate lower levels of externalizing problems such as oppositional and defiant behavior, disruptive behavior, and aggressive behavior (Carlson & Mann, 2002).

There are some concerns that SCT might be a byproduct of underlying internalizing symptoms. In particular, the SCT symptoms "appears tired," "apathetic," "slow-moving," and "unmotivated" share considerable overlap with symptoms of depression (Burns, Servera, Bernad, Carrillo, & Cardo, 2013). However, the pattern of impairment associated with SCT cannot be fully accounted for by the presence of internalizing symptoms (Becker, Luebbe, Fite, et al., 2014; Lee et al., 2014; McBurnett et al., 2014). Confirmatory Factor Analysis supports the notion that SCT is a distinct construct from anxiety and depression (Becker, Luebbe, Fite, et al., 2014; Burns et al., 2013). Therefore, although SCT, anxiety, and depression are related and may co-occur, they do not seem to be aspects of the same construct (Becker, Luebbe, Fite, et al., 2014;

Bernad, Servera, Grases, Collado, & Burns, 2014; Burns et al., 2013; Garner, Mrug, Hodgens, & Patterson, 2012; Lee et al., 2014; McBurnett et al., 2014; Penny, Waschbusch, Klein, Corkum, & Eskes, 2009). In fact, one study demonstrated that SCT and ADHD/IA were equally correlated with depression, such that children with SCT were no more likely than children with ADHD/IA to have comorbid depression (Burns et al., 2013). Further, the relations between SCT and various external correlates do not appear to change when depression is controlled (Burns et al., 2013; Garner et al., 2012). SCT, then, seems to be distinct from, yet comorbid with, ADHD as well as internalizing disorders.

Impairment

SCT is characterized by a pattern of social withdrawal and passivity, which is associated with both positive and negative characteristics in terms of social functioning (Marshall et al., 2014; Mikami et al., 2007; Watabe et al., 2014). As compared to children with lower levels of SCT, children with higher levels of SCT were rated by teachers as less impaired in peer relationships, teacher relationships, and classroom functioning (Watabe et al., 2014), and also demonstrated lower levels of relational and overt aggression (Marshall et al., 2014). However, higher levels of SCT are associated with lower rates of leadership (Marshall et al., 2014), poorer perception of subtle social cues, poorer memory for conversations, and lower rates of responsiveness in social settings (Mikami et al., 2007), suggesting that children with SCT may be more likely to be ignored by their peers rather than overtly disliked and excluded. Additionally, both parents and teachers rated children with higher levels of SCT as having more severe self-

esteem impairment (Watabe et al., 2014). In fact, higher levels of SCT have been found to predict poorer peer functioning over time; specifically, higher levels of SCT symptoms were related to lower popularity, greater negative social preference, and greater peer impairment across a six-month period (Becker, 2014). Flannery and colleagues (2014) found preliminary support for emotion dysregulation as a mediator for the association between SCT and social impairment in college students. Perhaps, children with SCT demonstrate impairment in their ability to regulate negative emotions, which consequently interferes with their ability to develop and maintain close social connections at a young age; this impairment likely persists over time and may lead to poorer psychosocial adjustment and difficulties in social relationships later in life (Flannery, Becker, & Luebbe, 2014; Willcutt et al., 2014).

There is also some speculation that a significant relation exists between SCT and academic impairment (Jacobson et al., 2012; Langberg, Becker, & Dvorsky, 2014; Lee et al., 2014). Higher scores on SCT symptoms predicted lower levels of academic competence, specifically in math, written language, and reading, even after controlling for ADHD symptoms (Barkley 2013a; Bauermeister et al., 2012; Langberg, Becker, & Dvorsky, 2014; Lee et al., 2014). However, other studies did not find a significant association between SCT and impaired academic functioning (Becker & Langberg, 2013; Watabe et al., 2014). The reason for this discrepancy may be due to the fact that many studies of SCT are conducted within an ADHD sample, examining individuals with high and low levels of SCT. This may make the direct relationship between SCT and academic functioning somewhat blurred. However, after statistically controlling for ADHD

symptoms, SCT symptoms do appear to add unique contribution to academic problems and impairment, particularly in the areas of reading, writing, math, organization problems, and homework (Barkley, 2013a; Langberg, Becker, & Dvorsky, 2014; Marshall et al., 2014; Willcutt et al., 2014). Therefore, it appears that SCT is related in some way to impaired academic achievement, but more research is needed in this area.

Diagnosis and Treatment

Due to the recent surge of interest in examining SCT symptoms, there is still considerable debate over the diagnostic criteria and clinical implications of recognizing SCT as an official disorder in the *DSM-5* (APA, 2013). As a consequence, specific interventions have not yet been designed for SCT, and the few treatment studies to date have examined SCT in relation to ADHD. Results from a randomized study of a behavioral psychosocial treatment adapted to meet the needs of children with ADHD/IA and SCT specifically indicated that children with SCT symptoms responded quite well to treatment, with SCT symptoms significantly decreasing at both post-treatment and follow up (Pfiffner et al., 2007). Although no stimulant medication studies have been conducted specifically for SCT symptoms to date, one study provides promising evidence for the use of atomoxetine, a norepinephrine reuptake inhibitor, in reducing SCT symptoms (Wietecha et al., 2013). This preliminary evidence provides some support for the adaptation of current evidence-based interventions for ADHD for use in treating SCT symptoms. Further, given the significant association between SCT and internalizing disorders, especially anxiety and depression, future directions could also explore the use of cognitive-behavioral therapy (CBT), social skills training (SST), or antidepressants as

possible treatment options (Barkley, 2014; Becker, Ciesielski, et al., 2014). Clearly more research is needed in this area before any conclusions can be drawn about effective treatments for SCT.

Relation Between SCT and ADHD

Many children with ADHD/IA also demonstrate characteristics of SCT (Barkley, 2013a; Becker & Langberg, 2014; Carlson & Mann, 2002; Garner et al., 2010; McBurnett, Pfiffner, & Frick, 2001). Confirmatory Factor Analyses have revealed a three-factor model including (1) inattentive symptoms, (2) hyperactive/impulsive symptoms, and (3) SCT symptoms (Hartman, Willcutt, Rhee, & Pennington, 2004; Lee et al., 2014). In these analyses, the SCT and inattentive factors were highly correlated whereas the SCT and hyperactive/impulsive factors were weakly correlated (Hartman et al., 2004), or even negatively correlated (Lee et al., 2014). This pattern of correlations suggests there is a stronger relation between SCT and inattention than between SCT and hyperactivity/impulsivity. It is important to note that children with ADHD, regardless of subtype, were rated as having significantly more SCT symptoms than children without ADHD (Harrington & Waldman, 2010; Hartman et al., 2004; Skirbekk et al., 2011). However, SCT tends to occur more frequently and more severely in children with ADHD/IA than the other two types of ADHD (Carlson & Mann, 2002; Garner et al., 2010; McBurnett et al., 2001). Taken together, these findings indicate that SCT is related to inattention.

Despite this relation, the ADHD and Disruptive Behavior Disorders Work Group for the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders*

(*DSM-IV*; American Psychiatric Association [APA], 1994) decided not to include SCT symptoms as specific diagnostic criteria for ADHD/IA due to their poor predictive power (Frick et al., 1994). Specifically, the presence of SCT tended to predict inattention, but the absence of SCT did not predict the absence of inattention. The role of SCT in ADHD/IA has since been re-evaluated and has yielded mixed results. As reviewed above, there is a consensus among researchers that SCT is related to inattentive symptoms and weakly related to hyperactive/impulsive symptoms (Carlson & Mann, 2002; Garner et al., 2010; Hartman et al., 2004; Jacobsen et al., 2012). There was, however, controversy over whether SCT should be considered a *subtype of ADHD* (Capdevila-Brophy et al., 2014; Carlson & Mann, 2002; McBurnett et al., 2001) or a *separate and distinct disorder* associated with unique types of impairment (Barkley 2013a, 2013b, 2014; Bauermeister et al., 2012; Becker et al., 2013; Becker & Langberg, 2013; Becker, Luebbe, Fite, et al., 2014; Becker, Marshall, et al., 2014; Garner et al., 2010; Lee et al., 2014; Moruzzi et al., 2014; Willcut et al., 2014).

Some researchers initially argued that the measurement of SCT symptoms might help distinguish two subtypes of ADHD/IA, making SCT symptoms part of ADHD (Capdevila-Brophy et al., 2014 Carlson & Mann, 2002; Jacobson et al., 2012; McBurnett et al., 2001; Skirbekk et al., 2011). The ADHD/IA subgroup is somewhat heterogeneous in respect to the number of hyperactive/impulsive symptoms present (Carlson & Mann, 2002). Individuals with ADHD/IA may present with anywhere from zero to five hyperactive/impulsive symptoms, and this may have implications for the manifestation of associated symptoms and impairment. For example, an individual who presents with six

inattention symptoms and five hyperactive/impulsive symptoms may have similar impairment to an individual with ADHD/C. In contrast, an individual who presents with six inattention symptoms and zero hyperactive/impulsive symptoms may have a more "pure" inattentive type of ADHD and lack much similarity with ADHD/C. Based on teacher ratings, children with both ADHD/IA and high SCT (high SCT/IA) demonstrated higher rates of withdrawn behavior, anxious/depressed behavior, social problems, and internalizing behavior and lower rates of aggression and externalizing behavior than children with ADHD/IA and low SCT (low SCT/IA; Carlson & Mann, 2002). In fact, children with low SCT/IA demonstrated more similarities to children with ADHD-combined type (ADHD/C) than children with high SCT/IA (Carlson & Mann, 2002). Symptoms of inattention may be expressed differently depending upon the presence of SCT symptoms; therefore it is important to distinguish between high and low SCT subtypes of ADHD/IA to get a better idea of the pattern of impairment for each subtype. SCT could serve as a potential predictor of attention difficulties in the absence of hyperactivity/impulsivity and help identify more homogenous subtypes of ADHD.

More recently, however, researchers have made a compelling case that positions SCT as a separate and distinct disorder from ADHD (Barkley 2013a, 2013b, 2014; Bauermeister et al., 2012; Becker et al., 2013; Becker & Langberg, 2013; Becker, Luebbe, Fite, et al., 2014; Becker, Marshall, et al., 2014; Garner et al., 2010; Lee et al., 2014; Moruzzi et al., 2014; Willcut et al., 2014). While SCT is not currently identified as an official disorder in the *DSM-5* (APA, 2013), these researchers have argued that

because SCT is associated with unique (1) etiology, (2) demographic correlates and developmental course, (3) impairment, and (4) comorbidities, it is separate from ADHD.

Etiology

First, SCT appears to have a different pattern of etiology than ADHD. There is some genetic overlap between SCT, inattentive, and hyperactive/impulsive symptoms. However, whereas ADHD is substantially heritable, SCT is only moderately heritable (Moruzzi et al., 2014). Further, SCT is much more susceptible to influence by unique, unshared environmental factors than ADHD (Moruzzi et al., 2014). SCT is more strongly associated with greater family and child psychosocial adversities, such as lower parental education, lower household income, greater parental unemployment or disability status, and more parental divorce, compared to ADHD (Barkley, 2013a, 2013b; Moruzzi et al., 2014). Moreover, SCT symptoms may occur as a result of pathology other than ADHD. For example, Acute Lymphoblastic Leukemia (ALL) survivors display more SCT symptoms than control children (Reeves et al., 2007). Elevated SCT symptoms have also been linked to prenatal alcohol exposure (Graham et al., 2013). Overall, social adversities appear to play a greater role in the development of SCT compared to ADHD.

Furthermore, SCT and ADHD may also be linked to different personality dimensions. SCT is linked to punishment sensitivity and shyness/fear, dimensions that are associated with internalizing symptoms (Becker et al., 2013). In contrast, ADHD is linked to reward sensitivity and impulsivity, dimensions that are associated with externalizing symptoms (Becker et al., 2013). These findings further support the distinction between SCT and ADHD, suggesting that the personality dimensions

associated with SCT more closely align with internalizing psychopathology rather than externalizing psychopathology.

Demographic Correlates and Developmental Course

ADHD tends to have higher prevalence rates among males and some ethnic minority groups (Barkley, 2012, 2013a). However, there is no evidence of substantial gender or ethnic differences for SCT (Barkley, 2012, 2013a). In addition, SCT does not seem to be associated with age. One study suggests that SCT may have a somewhat later age of onset than ADHD and may increase slightly with age (Barkley, 2013a); however many studies have not found an effect of age (Lee et al., 2014). In contrast, symptoms of hyperactivity tend to decline over time (Barkley, 2012), suggesting a differential developmental course for ADHD compared to SCT.

Types of Impairment

Further, unlike ADHD, SCT is not associated with as severe and pervasive executive functioning deficits in daily life activities (Barkley 2003, 2012, 2013a, 2013b, 2014; Capdevila-Brophy et al., 2014; Willcutt et al., 2014). Individuals with ADHD constantly struggle with time management, self-organization, problem solving, self-restraint, self-regulation of emotion, and self-motivation (Barkley, 2012; 2013a). It is suggested that the executive functioning deficits associated with SCT are fewer, and more similar to the executive functioning deficits that are closely associated with symptoms of inattention (Becker & Langberg, 2014). Further, there is currently no evidence linking SCT to difficulties with inhibition or impulsiveness (Barkley 2012, 2013a, 2013b, 2014; Becker & Langberg, 2013, 2014; Penny et al., 2009). However,

when SCT is comorbid with ADHD, executive functioning deficits are much more severe than with either SCT or ADHD alone (Barkley, 2013b). Children with high SCT/IA were found to have greater problems with self-monitoring, working memory, and metacognition, and fewer problems with sustained attention when compared to children with low SCT/IA and ADHD/C (Barkley, 2013a; Becker & Langberg, 2014; Capdevila-Brophy et al., 2014). A study by McBurnett and colleagues (2014) provides additional evidence linking SCT with working memory deficits in children. Additional evidence from a study of adults with SCT suggests that SCT alone is more impairing than ADHD in the executive functioning domains of self-organization and time management (Barkley, 2012). However, more research is needed in this area to fully understand the relation between SCT and neuropsychological deficits, mainly executive functioning. As it stands, SCT does not appear to be associated with as severe and pervasive executive functioning deficits as ADHD. However, some unique executive functioning deficits seem to be present for individuals with SCT symptoms, mainly in the domains of working memory, organization, and time-management.

SCT seems to represent a different type of attentional problem than ADHD (Barkley, 2013b). SCT is associated with deficient selective attention, sluggish cognitive processing, memory retrieval problems, and organizational problems, whereas ADHD is associated with poor persistence, poor inhibition, and poor resistance to distraction (Barkley, 2003). More specifically, Becker and Langberg (2014) found that children with SCT exhibited greater problems in task initiation, managing current and future-oriented task demands, organization, and problem solving. In contrast, children with ADHD/C

exhibited greater problems with behavioral regulation, including behavioral inhibition, attentional shifting, and emotional control (Becker & Langberg, 2014). Thus children with SCT struggle more with concentration difficulties, low motivation, planning, and slower motor processing than children with ADHD (Barkley, 2013b; Becker & Langberg, 2014). The cognitive dysfunctions underlying SCT are vastly different than those involved in ADHD and are associated with unique types of impairment.

Additionally, both children with ADHD and children with SCT are impaired in school; but whereas ADHD is a *productivity* problem, SCT seems to be an *accuracy* problem (Barkley, 2013b). Children with SCT have a difficult time distinguishing important from unimportant information (Barkley, 2003) and are less able to use relevant environmental cues in task responding (Penny et al., 2009). Thus SCT may interfere with the accuracy of a child's schoolwork. In addition, SCT adds unique contribution to a child's impairment in academic functioning—particularly for math performance, writing, reading, organizational problems, and homework—above and beyond ADHD symptoms (Barkley, 2013a; Bauermeister et al., 2012; Langberg, Becker, & Dvorsky, 2014; Marshall et al., 2014). This suggests that SCT and ADHD represent distinct types of academic impairment.

Children with SCT demonstrate a unique pattern of social impairment represented by elevated withdrawal and social passivity, which likely leads to peer neglect (Marshall et al., 2014; Watabe et al., 2014). In addition, children with high levels of SCT display lower levels of leadership and less peer-directed aggression in a classroom setting compared to children low levels of SCT (Marshall et al., 2014). Further, children with

SCT are less likely to exhibit disruptive behaviors and receive time-outs as a consequence, suggesting that SCT may serve as a potential protective factor in terms of social functioning in the classroom that is not evident in ADHD (Becker, Luebbe, Fite, et al., 2014; Watabe et al., 2014). In contrast, children with ADHD/C and low SCT/IA are characterized by aggressive peer interactions that are not better explained by comorbid Oppositional Defiant Disorder (ODD) or Conduct Disorder (CD; Maedgen & Carlson, 2000; Marshall et al., 2014). Thus, children with SCT exhibit a more passive form of social dysfunction that is not characterized by disruptive behavior.

Comorbidities

Moreover, the pattern of comorbidity for SCT and ADHD is vastly different. Children with SCT rarely show aggression or symptoms of ODD or CD, which are commonly comorbid with ADHD (Milich et al., 2001). In fact, two studies found a negative relationship between SCT and ODD (Lee et al., 2014; McBurnett et al., 2014). Rather, children with SCT are at a greater risk for internalizing symptoms, such as anxiety and depression, than children with ADHD (Barkley, 2013a; Bauermeister et al., 2012; Becker, Luebbe, Fite, et al., 2014; Garner et al., 2010; Lee et al., 2014; Milich et al., 2001; Willcutt et al., 2014). Thus, SCT seems to represent a separate, unique syndrome from ADHD because it demonstrates a different pattern of comorbidity than ADHD.

Finally, not all children with SCT have ADHD and not all children with ADHD have SCT (Barkley, 2013a, 2013b), implying that SCT is not wholly defined by its connection to ADHD. The fact that SCT can exist independently from ADHD suggests

that SCT is a distinct disorder of attention. However, these two attention disorders are likely highly comorbid, considering that the majority of children with SCT also present with ADHD (Barkley, 2013a, 2013b). When there is overlap between SCT and ADHD, it is more likely to be with ADHD/IA (Barkley, 2013a, 2013b). Thus, the relation between SCT and ADHD represents a relation of partial comorbidity of two distinct disorders, similar to the relation between anxiety and depression, rather than of one disorder as a subtype of the other.

Alternative Explanations for the Behaviors Related to SCT

Because SCT is an understudied cluster of symptoms, there is still some speculation about the nature and validity of its symptoms. In particular, researchers have recognized that some SCT behaviors resemble aspects of daytime sleepiness (Becker, Luebbe, & Langberg, 2014; Langberg, Becker, Dvorsky, & Luebbe, 2014). For example, the SCT symptoms "lethargic, more tired than others" and "trouble staying alert or awake" share overlap with daytime sleepiness (Becker, Luebbe, & Langberg, 2014; Langberg, Becker, Dvorsky, & Luebbe, 2014). Confirmatory Factor Analysis has demonstrated that daytime sleepiness is in fact distinct from SCT despite the considerable overlap between the two (Langberg, Becker, Dvorsky, & Luebbe, 2014). However, individuals with SCT are highly likely to exhibit daytime sleepiness as well, and individuals with SCT and comorbid daytime sleepiness often demonstrate greater functional impairment overall (Langberg, Becker, Dvorsky, & Luebbe, 2014).

Additionally, it is possible that SCT could be better explained by a deficit in motivation. This is not likely the case, however, as past research examining executive

functioning deficits associated with SCT has not linked SCT to deficits in self-motivation (Barkley, 2012, 2013a). In addition, factor analytic studies have shown that aspects of SCT related to poor initiation, impersistence, and a tendency to daydream actually show more overlap with both inattentive and hyperactive ADHD symptoms (Jacobson et al., 2012). The SCT symptom "low initiative" has failed to show discriminant validity between SCT and deficits in motivation in multiple studies (Barkley, 2013a, 2014; Lee et al., 2014). Thus, SCT symptoms related to initiative and motivation may not be the most predictive of SCT as whole (Jacobson et al., 2012; Langberg, Becker, & Dvorsky, 2014; Penny et al., 2009). More research is needed to tease apart the relation between SCT and motivation and initiative; however, it is important to note that SCT cannot be wholly explained by a deficit in motivation.

Although sluggishness appears to be a fundamental and observable feature of SCT, it does not appear to meaningfully discriminate SCT from other disorders (Becker, Marshall, et al., 2014). More recent measures of SCT have been developed to address the overlap between SCT, depression, daytime sleepiness, and lack of motivation, and consequently place a lesser emphasis on the depression-like symptoms. For example, the Kiddie-Sluggish Cognitive Tempo (K-SCT) Diagnostic Interview (McBurnett, 2010) includes multiple behavioral examples and additional probes to rule out the endorsement of symptoms due to depression or sleep problems (Burns et al., 2013).

Researchers are exploring SCT in an attempt to refine and better understand these symptoms and associated impairments, and the current evidence suggests that SCT should be considered a distinct, diagnosable mental health condition (Barkley 2013a,

2013b, 2014; Bauermeister et al., 2012; Becker et al., 2013; Becker & Langberg, 2013; Becker, Luebbe, Fite et al., 2014; Becker, Marshall, et al., 2014; Garner et al., 2010; Lee et al., 2014; Moruzzi et al., 2014; Willcut et al., 2014). However, classifying SCT as a distinct attentional disorder will come with some challenges. First and foremost is the issue of SCT being accepted as an official disorder in updated versions of the *DSM*. Second is the issue of educating the public about SCT and related impairment in children in order to ensure these children receive appropriate interventions and services. Teachers have come to play an important role in the identification of child psychopathology, as they are often the initial referral source for children presenting with mental health concerns (Loe & Feldman, 2007; Snider et al., 2003). Therefore, it is important to understand teachers' roles and perspectives in recognizing childhood psychopathology and referring students presenting with such symptoms.

Identification of Mental Health Concerns by Teachers

Given their frequent interactions with children, teachers are in an excellent position to provide early identification of and referrals for emotional and behavioral problems in childhood (Herbert et al., 2004). In addition, teachers have also become a vital component in the assessment of children with psychological problems because they have the opportunity to observe and interact with children in different situations than parents. For example, children with ADHD are often brought to clinical attention after causing problems at school (Loe & Feldman, 2007). At school, children are expected to stay seated, pay attention, and follow instructions, and these tasks can be very difficult for a child with ADHD (Barkley, 1998). In addition, children complete less preferred and

more effortful tasks at school, such as independent work and testing, and it is in these types of tasks that attention regulation difficulties tend to become evident (Jacobson et al., 2012). Social Anxiety Disorder (SA) is another disorder that is often first noticed in a school setting, as children with SA avoid common academic activities such as giving oral presentations, participating in classroom discussions, interacting with peers and teachers, and engaging in extracurricular activities (APA, 2013; Beidel, Turner, & Morris, 1999). Thus, teacher ratings are extremely relevant to the diagnosis of childhood psychological disorders, not only because symptoms must be present across settings, but also because teachers witness children performing tasks in which they do not partake at home.

Despite the fact that teachers are in a good position to identify mental health problems in children, they face many obstacles. First, the student to teacher ratio is ever increasing, with an average class size of approximately 25 to 26 students (National Education Association, 2013). Second, full-time elementary teachers spend an average of 52 hours per week on school related activities, including required teaching, lesson planning, grading, communicating with parents, and attending meetings (Goldring, Gray, & Bitterman, 2013). On top of these duties, teachers are then left with the responsibility of monitoring and effectively managing the behavior of an increasing number of students in order to maintain a positive learning environment for the entire classroom.

Furthermore, several studies have confirmed that teachers lack the opportunity to learn about mental health problems in general (Anderson et al., 2012; Bekle, 2004; Herbert et al., 2004; Jerome, Gordon, & Hustler, 1994; Kos et al., 2004). Specifically, 89% of in-service elementary school teachers (i.e., current teachers) reported that they

had no instruction on ADHD during their college education (Jerome et al., 1994). Further, in-service teachers report even less knowledge of SA relative to ADHD (Herbert et al., 2004), possibly because internalizing symptoms are less noticeable in the classroom. Studies comparing the knowledge of in-service and pre-service (i.e., current education majors) elementary school teachers suggest that increased training on ADHD and more experience teaching students with ADHD are associated with greater knowledge of ADHD (Anderson et al., 2012; Bekle, 2004; Kos et al., 2004). These results highlight the idea that more exposure to children with ADHD is an important factor in increasing teachers' knowledge of ADHD. Rather than learning about childhood mental health problems during their required undergraduate coursework, teachers are learning through experiences with students in their classrooms.

Additionally, studies have shown that in-service teachers are better informed than pre-service teachers regarding myths about ADHD; significantly more in-service teachers than pre-service teachers correctly identified that a child can be appropriately labeled as ADHD and not necessarily present as overactive (Anderson et al., 2012; Bekle, 2004). Thus, there is reason to suspect that pre-service teachers are less informed about ADHD/IA and more inclined to notice hyperactive children. Taken together, the research highlights the lack of education and training about childhood mental health disorders that pre-service teachers are receiving during their college education. If education majors are not learning about ADHD, one of the more common childhood disorders, it seems likely they are also not learning about other problematic behaviors, including SCT.

Teachers also have several misconceptions of childhood disorders, likely due to a lack of training in this area. First, teachers tend to be most concerned with children who are displaying inappropriate behaviors in the classroom, such as talking out of turn, not complying with instructions, and being aggressive, because these behaviors are disruptive to the classroom learning environment (Kauffman, Lloyd, & McGee, 1989). Second, teachers tend to perceive externalizing behaviors as having a worse prognosis than internalizing behaviors (DeStefano, Gesten, & Cowen, 1977). These tendencies may bias teachers' ability to recognize and identify children struggling with internalizing or less disruptive behaviors. Third, teachers tend to inaccurately view all externalizing problems as being indicative of ADHD. A study by Pilling (2000) concluded that teachers were fairly accurate in identifying ADHD characteristics, but they also tended to incorrectly identify non-ADHD characteristics, such as anxiety, depression, and oppositional defiant disorder as being characteristic of ADHD. In addition, the majority of teachers incorrectly identified an energetic but typical child as having ADHD (Pilling, 2000). These results suggest that teachers have high sensitivity but low specificity for ADHD, as they tended to see all types of disruptive behavior as ADHD. One reason for this misconception is the presence of bidirectional halo effects between ADHD and ODD (Hartung et al., 2010). Specifically, children who displayed ADHD/C symptoms were also given artificially inflated ratings of oppositionality, and vice versa. In addition, children who displayed inattentive symptoms were given higher ratings of hyperactivity as well (Hartung et al., 2010).

Given the lack of training that teachers receive in common childhood mental disorders, less-known and newer conditions are at an even greater risk of being overlooked. While SCT is not recognized as an official disorder in the *DSM-5* (APA, 2013), there is evidence that children are struggling with these symptoms and that these symptoms are causing impairment. However, children with SCT symptoms are less likely to act out at school and may sit quietly, seeming to work, when they may in fact be struggling to process information. In addition, symptoms such as daydreaming and sluggishness may be less noticeable in the school setting because these behaviors are not disruptive and a teacher has many other children and tasks to manage (Watabe et al., 2014). SCT may represent a more passive form of inattention that does not disrupt the classroom learning goals and therefore does not appear to impair the child's functioning. In fact, teachers rated children with high SCT symptoms as less impaired in peer relationships, relationship with the teacher, academic functioning, and classroom functioning than children with ADHD (Watabe et al., 2014). Thus, there is reason to believe that children with SCT are 'falling through the cracks' in schools. If children with SCT are going unrecognized in the classroom, they are likely not getting referred for intervention or additional educational services. It is important for teachers to be aware not only of students displaying disruptive and hyperactive symptoms but also students displaying symptoms related to inattention and sluggishness.

CHAPTER 3

CURRENT STUDY

The current study examined pre-service teachers' knowledge and perceptions of SCT compared to two more well-known childhood disorders. More specifically, undergraduate education majors from a midwestern university read vignettes describing three different fictitious boys presenting with symptoms of SCT, a common externalizing disorder (ADHD/HI), and a common internalizing disorder (Social Anxiety Disorder; SA). Then participants rated each of the three vignettes in terms of their concern for the boy described (e.g., whether they believe he is struggling, whether they would refer the boy for additional services). The main purpose of this project was to determine whether pre-service teachers are concerned with symptoms of SCT in the classroom, as compared to two more well-known disorders. To test this research question, four specific hypotheses were developed.

Hypothesis 1

It was hypothesized that undergraduate education majors would view ADHD/HI behaviors as more problematic than SCT and SA behaviors. In addition, participants would have the most unfavorable attitudes toward working with the child with ADHD/HI and slightly more favorable attitudes toward working with the children with SA and SCT. Participants would also be most concerned about the child with ADHD/HI, followed by the child with SP, and least concerned about the child with SCT. This was based on the notion that ADHD/HI is an externalizing disorder that may disrupt classroom learning

goals and cause additional stress for teachers (Kauffman et al., 1989; Watabe et al., 2014).

Hypothesis 2

Second, it was hypothesized that participants would rate the child with ADHD/HI as the most in need of a referral to a school psychologist or school counselor. The children with SCT and SA would be rated as less in need of a referral to a school psychologist or school counselor. Further, the child with ADHD/HI would be rated as the most likely to benefit from an IEP or 504 Plan, followed by the child with SA. The child with SCT would be rated as the least likely to benefit from an IEP or 504 Plan. This hypothesis was based on the notion that teachers tend to perceive externalizing behaviors as being more problematic and having a worse prognosis than internalizing behaviors (DeStefano et al., 1977).

Hypothesis 3

It was also hypothesized that undergraduate education majors would indicate that they have heard the most about ADHD, followed by SA, and the least about SCT. ADHD and Social Anxiety Disorder are better known among the general public (Herbert et al., 2004), whereas SCT is a newer and under-researched construct.

Hypothesis 4

Lastly, it was hypothesized that participants who have more experience working with children and/or learning about childhood disorders would have more accurate ratings of SCT, ADHD, and SA, and will be more likely to refer all three children to a school psychologist or school counselor. This hypothesis was based on the notion that

teachers tend to learn more about childhood disorders through direct experience with children who have disorders (Anderson et al., 2012; Bekle, 2004; Kos et al., 2004).

CHAPTER 4

METHOD

Participants

Participants were 161 undergraduate Elementary Education majors from the University of Northern Iowa. Table 1 provides a description of participant characteristics. Participants ranged in age from 18 to 34 years (M = 19.73, SD = 1.98). The majority of participants were female (91.9%, n = 148). Approximately 32% of participants were freshman (n = 52), 25% were sophomores (n = 40), 16% were juniors (n = 26), and 26% were seniors (n = 42). Participants had spent an average of 2.65 semesters (SD = 1.43) either student teaching or observing in a classroom. The current study was determined to have adequate power based on an a priori power analysis conducted using G*Power statistical software (Faul, Erdfelder, Lang, & Buchner, 2007).

Materials

Vignettes

Three vignettes (Appendices A-C) were developed for the purposes of this study. The vignettes describe three fourth-grade boys presenting with (1) SCT symptoms, (2) ADHD/HI symptoms, or (3) SA symptoms in a classroom setting. Professionals, including three fourth-grade teachers and a Clinical Psychologist not associated with the research, reviewed the vignettes to ensure they are representative of typical classroom behavior (fourth-grade teachers) and the correct disorders (Clinical Psychologist). Feedback from the teachers and Psychologist were incorporated into the final version of the vignettes.

Vignette Questionnaire

Each vignette has a corresponding seven-item questionnaire that was developed for the current study to assess participants' knowledge and attitudes about working with children with SCT, ADHD, and SA (Appendix D). The questions also tap into participants' beliefs about potential interventions for the child and whether or not they would refer the children to the school psychologist or school counselor for additional services. Participants answered six questions on a scale of 1 (Positive Response) to 6 (Negative Response) about each child. There was one open-ended question asking participants to give the child a diagnosis, if warranted.

Demographics

A separate Demographics form (Appendix E) was created by the author for this study. It included questions about the participants' age, gender, education level, and training in childhood disorders. Lastly, participants were asked to rate how much they know about SCT, ADHD, and SA on a Likert scale ranging from 1 ("Nothing") to 5 ("A lot").

Procedure

IRB approval was obtained prior to data collection. The Department Head of the Elementary Education Department at the University of Northern Iowa agreed to distribute an email regarding this study to all elementary education majors at the university. This study was administered as an online survey available for participants to complete at their convenience. The online survey was hosted on Qualtrics, a secure survey platform for

which the university has a license. Potential participants were emailed a short description of the study and the link to the online survey from their Department Head. Participation lasted approximately 10-15 minutes, and participants provided electronic consent before beginning participation. This study was a within-subjects experiment, and therefore each participant was presented with the three vignettes and corresponding questionnaires in a randomized order. Participants completed the demographics questions after reading all three vignettes. Last, participants were directed to a separate form to enter their email address to eliminate the link between their responses and identifying information. Participants were emailed a $10 Amazon.com gift card upon completion of the study. Participants were able to opt out of receiving a gift card if they did not wish to provide an email address.

CHAPTER 5

RESULTS

Statistical Analysis and Preparation

The Vignette Questionnaire had a high level of internal consistency overall, as determined by a Cronbach's alpha of 0.83. Additionally, as shown in Table 2, the internal consistency as measured by Chronbach's alpha was high when ADHD was being assessed (0.75), when SCT was being assessed (0.74), and when SA was being assessed (0.73). A Bonferonni corrected *p*-value of .0125 (.05/4 hypotheses = .0125) was used to control for family-wise error. After initial inspection of the data, it was concluded that data was missing completely at random (MCAR). The loss of cases due to missing data was small; less than 5%. According to Graham (2009), biases and the loss of power are likely to be inconsequential. Missing cases were therefore excluded from analyses using listwise deletion.

Outliers in the data were identified by inspection of a boxplot. There were 19 outliers for the favorability variable, five for the problematic variable, ten for the concern variable, seven for the referral variable, and eight for the knowledge variable. It is important to consider why there might be outliers. Perhaps the outliers are due to subjective differences in participants' sensitivity to the assigned values of the rating scale. The outliers did not influence the direction or pattern of results, and were removed from all following analyses. In addition, the removal of outliers allowed the data set to better meet the assumption of normality, as discussed below.

For the first three hypotheses, six repeated measures ANOVA were conducted to test the main effect of disorder[1] (Independent Variable; SCT, ADHD, or SP) on (1) the degree to which the participant finds the behaviors problematic, (2) the participant's attitudes toward having this child in the classroom, (3) the amount of concern the participant has for the child, (4) the likelihood of referring the child to a school psychologist or school counselor, (5) the likelihood of indicating that the child would benefit from an IEP or 504 Plan, and (6) the amount of knowledge participants report (Dependent Variables). A one-way repeated measures ANOVA was determined to be an appropriate statistical test for these hypotheses because the dependent variables are continuous and the within-subjects factor is categorical with three levels. If the ANOVA was significant, planned comparisons using paired samples *t*-tests were conducted to explore the relations among the three variables.

Each dependent variable was assessed for normality by first examining skewness and kurtosis, and then by visual inspection of histograms and normal Q-Q plots if necessary. *Z*-scores were calculated for skewness and kurtosis by dividing these values by their respective standard errors. For the current study, a z-score within the range of ±1.96 was considered normally distributed based on a statistical significance level of .05 (Field, 2013). Skewness values ranged from -2.26 to 6.45 and kurtosis values ranged from -2.47 to 1.90. Based on these guidelines, the following variables violated the assumption of normality: ADHD favorability, ADHD concern, ADHD IEP/504 Plan, SA favorability, SA IEP/504 Plan, and SCT knowledge. These six variables were then visually inspected to determine the degree of non-normality. Two variables (ADHD

[1] Even though SCT is not yet recognized as an official disorder in the *DSM-5*, it is referred to as a disorder throughout the Results Section for ease of clarity.

concern and ADHD IEP/504 Plan) were negatively skewed and two variables (SA favorability and SCT knowledge) were positively skewed. Two variables (ADHD favorability and SA IEP/504 Plan) were platykurtic. There is strong research supporting the robustness of ANOVA tests with non-normally distributed data (Field, 2013; Glass, Peckham, & Sanders, 1972 for a review; Schmider, Ziegler, Danay, Beyer, & Buhner, 2010). Further, to avoid potential negative influences of violating the assumption of normality for ANOVA designs, researchers have advised to use sample sizes of at least 25 participants per condition (Schmider et al., 2010). Considering the robustness of the ANOVA test and the large sample size of the current study (N = 161), the repeated measures ANOVAs were conducted as usual, but the violation of normality should be noted.

Each dependent variable was also assessed for sphericity using Mauchly's Test of Sphericity. Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated for the favorability, $\chi^2(2) = 16.046$, $p = .000$, and knowledge, $\chi^2(2) = 10.282$, $p = .006$, variables; therefore, a Greenhouse-Geisser correction was used for these two variables. The remaining four variables did not violate the assumption of sphericity.

For the fourth hypothesis, an experience variable was calculated by summing the number of semesters spent observing or student teaching in a classroom with the number of courses taken relevant to childhood mental health. A logistic regression was conducted to determine the degree to which participants' experience (Independent Variable) influenced their accuracy of identifying the disorder (Dependent Variable). Because none

of the participants correctly identified SCT as a diagnosis, logistic regression analyses were only run for the ADHD and SA variables. A linear regression was conducted to determine the degree to which participants' experience influenced their degree of referral. A non-linear relation between the independent and dependent variables was not observed. Independence of errors was assessed by the Durbin-Watson test. The Durbin-Watson values ranged from 2.02 to 2.11, indicating that there was no correlation between residuals. The residuals were determined to be normally distributed and to have adequate homoscedasticity based on the inspection of histograms and scatterplots, respectively.

Hypothesis 1

It was hypothesized that undergraduate education majors would view the ADHD/HI behaviors as the most problematic and have the most unfavorable attitudes toward working with the child with ADHD/HI. It was expected that participants would view SCT and SA behaviors as less problematic than ADHD/HI behaviors, and have similarly more favorable attitudes toward working with the children with SCT and SA. It was also expected that participants would be most concerned about the boy with ADHD/HI, followed by SA, and least concerned about SCT.

A repeated measures ANOVA determined that there was a statistically significant effect of disorder on the degree to which participants viewed the behaviors as problematic, $F(2, 310) = 17.24$, $p < .001$, partial $\eta^2 = .10$ (see Table 3). As expected, planned comparisons revealed that participants viewed ADHD/HI behaviors ($M = 4.39$) as significantly more problematic than SCT behaviors ($M = 4.07$; $t(155) = -3.46$, $p = .001$) and SA behaviors ($M = 3.81$; $t(155) = 5.52$, $p < .001$). Participants viewed SA

behaviors as significantly less problematic than SCT behaviors ($t(160) = 2.96$, $p = .004$). This pattern of results suggests that participants viewed ADHD/HI behaviors as the most problematic and SA behaviors as the least problematic.

There was also a significant effect of disorder on participants' attitudes toward having the particular child in their classroom, $F(1.81, 256.92) = 29.35$, $p < .001$, partial $\eta^2 = .17$ (see Table 3), with planned comparisons revealing that participants had significantly more unfavorable attitudes toward working with the child with ADHD/HI ($M = 3.22$) compared to the children with SCT ($M = 2.92$; $t(148) = -3.99$, $p < .001$) and SA ($M = 2.65$; $t(145) = 6.95$, $p < .001$). Further comparisons revealed that participants had significantly more favorable attitudes toward working with the child with SA than the child with SCT, $t(149) = 4.73$, $p < .001$. This pattern of results suggest that participants had the least favorable attitudes toward working with the child with ADHD/HI and the most favorable attitudes toward working with the child with SA.

A repeated measures ANOVA determined that mean level of concern did not differ significantly among type of disorder, $F(2, 298) = 1.94$, $p = .145$, partial $\eta^2 = .01$ (see Table 3). Contrary to what was hypothesized, participants were equally concerned about each child.

Hypothesis 2

Second, it was hypothesized that participants would rate the child with ADHD/HI as the most likely to be referred to a school psychologist or school counselor. The children with SCT and SA would be rated as less likely to be referred to a school psychologist or school counselor. Further, the child with ADHD/HI would be rated as the

most likely to benefit from an IEP or 504 Plan, followed by the child with SA, and then the child with SCT.

A repeated measures ANOVA determined that there was a statistically significant effect of disorder on the likelihood of the participant referring the child to a school psychologist or school counselor, $F(2, 304) = 16.32$, $p < .001$, partial $\eta^2 = .097$ (see Table 3). Contrary to what was expected, planned comparisons revealed that participants were actually the most likely to refer the child with SA ($M = 4.50$) to a school psychologist or school counselor compared to the children with SCT ($M = 4.07$; $t(153) = -4.31$, $p < .001$) and ADHD/HI ($M = 3.90$; $t(152) = -5.17$, $p < .001$). Further comparisons between ADHD and SCT revealed that participants were equally less likely to refer these children to the school psychologist or school counselor, $t(159) = 1.77$, $p = .079$.

A repeated measures ANOVA determined that there was a statistically significant effect of disorder on the likelihood of the participant indicating that the child would benefit from an IEP or 504 Plan, $F(2, 314) = 12.11$, $p < .001$, partial $\eta^2 = .07$ (see Table 3). As expected, planned comparisons revealed that participants indicated that the child with ADHD ($M = 4.30$) would be the most likely to benefit from an IEP or 504 Plan compared to the children with SCT ($M = 3.96$; $t(158) = -2.91$, $p = .004$) and SA ($M = 3.70$; $t(158) = 4.78$, $p < .001$). Contrary to what was expected, participants indicated that the children with SCT and SA were equally less likely to benefit from an IEP or 504 Plan, $t(158) = 2.05$, $p = .042$.

Hypothesis 3

Third, it was hypothesized that undergraduate education majors would indicate that they have heard the most about ADHD, followed by SA, and the least about SCT. A repeated measures ANOVA revealed that there was a statistically significant effect of disorder on participants' amount of knowledge, $F(1.83, 273.73) = 314.76$, $p < .001$, partial $\eta^2 = .68$ (see Table 3). Planned comparisons revealed participants' knowledge of each disorder was in the expected direction. Participants knew significantly more about ADHD ($M = 3.54$) compared to SA ($M = 2.48$; $t(154) = 11.02$, $p < .001$) and SCT ($M = 1.42$; $t(155) = -27.82$, $p < .001$). Further, participants knew significantly more about SA compared to SCT, $t(151) = -13.27$, $p < .001$.

Hypothesis 4

Last, it was hypothesized that participants who have more experience working with children and/or learning about childhood disorders will have more accurate ratings of all three disorders, and will be more likely to refer all three children to a school psychologist or school counselor. The logistic regression models were not statistically significant, and suggest that greater experience does not predict more accurate ratings of ADHD, $\chi^2(1) = .08$, $p = .772$, or SA, $\chi^2(1) = .16$, $p = .685$. The linear regression models were also not statistically significant, and suggest that experience does not predict the likelihood of referring the children with ADHD ($F(1, 158) = .04$, $p = .842$), SCT ($F(1, 159) = 1.349$, $p = .247$), or SA ($F(1, 159) = .001$, $p = .973$) to a school psychologist.

Exploratory Analyses

Because participants indicated being equally concerned about each child but had different ratings related to potential referrals and interventions, an exploratory analysis was conducted to determine whether participants would discuss these concerns with the children's parents. A repeated measures ANOVA determined that participants would be equally likely to mention these concerns to the each child's parents, $F(2, 318) = 0.33$, $p = .721$, partial $\eta^2 = .002$.

After reading each vignette, participants were asked to decide what, if any, diagnosis should be assigned to the child. Approximately 76% of participants correctly diagnosed the child with ADHD/HI and 31% of participants correctly diagnosed the child with SA or a related anxiety problem. None of the participants were able to correctly diagnose the child with SCT. In addition, at the end of the study, participants were asked to identify which child they were the most concerned about and qualitatively explain their rationale. Contrary to previous concern ratings, 49% of participants reported being the most concerned about the child with SCT, 27% about SA, and 24% about ADHD/HI.

CHAPTER 6

DISCUSSION

General Discussion

This study examined pre-service teachers' knowledge and perceptions of mental illness in the classroom; specifically Sluggish Cognitive Tempo (SCT), Attention-Deficit/Hyperactivity Disorder (ADHD), and Social Anxiety Disorder (SA). Of particular interest was whether pre-service teachers viewed symptoms of SCT – a relatively new cluster of symptoms related to mental fogginess and sluggishness – as equally concerning and problematic as two more well-known disorders, ADHD/HI and SA. It was hypothesized that pre-service teachers would be the most concerned about the child presenting with ADHD/HI symptoms, and would also view these behaviors as the most problematic as externalizing symptoms are especially disruptive in the classroom (Kauffman et al., 1989; Watabe et al., 2014). However, pre-service teachers in this study reported similar levels of concern for the three fictitious children described as having symptoms of SCT, ADHD, and SA. Despite the fact that SCT and SA are associated with internalizing symptoms and lower levels of disruptive behaviors, children with SCT and SA still exhibit significant impairment in both academic and social domains (Barkley 2013a; Bauermeister et al., 2012; Becker, 2014; Beidel et al., 1999; Jacobson et al., 2012; Langberg, Becker, & Dvorsky, 2014; Lee et al., 2014; Marshall et al., 2014; Mikami et al., 2007; Watabe et al., 2014). Therefore, it is promising that pre-service teachers reported as much concern for the children with SCT and SA as the child with ADHD/HI. These results suggest that pre-service teachers may be concerned about both hyperactive

behavioral problems in childhood (i.e., ADHD) and non-hyperactive behavioral problems (i.e., SCT and SA). Notably, pre-service teachers demonstrated concern for a child with SCT, a more passive form of inattention that is less disruptive than ADHD, but still impairs a child's functioning and development.

However, despite being concerned about all three types of behaviors, pre-service teachers viewed ADHD/HI behaviors as the most problematic, and SA behaviors as the least problematic. It was expected that ADHD/HI behaviors would be considered the most problematic, due to the extra effort required by teachers to manage these behaviors in the classroom (Kauffman et al., 1989), but a significant difference between SCT and SA behaviors was not expected. Perhaps SCT was viewed as more problematic than SA in a school setting because symptoms such as sleepiness, daydreaming, and poor concentration indicate that children with SCT may be missing important concepts in class and not learning to their full potential. In contrast, children with SA are able to concentrate and focus in class and thus are perceived to have a greater potential to learn, despite their anxiety.

Teachers' attitudes toward their students may negatively influence classroom management and teaching strategies (Vereb & DiPerna, 2004). In addition, teachers are often expected to play a crucial role in the implementation of school-based mental health interventions, and their negative attitudes may compromise the fidelity of the intervention (Vereb & DiPerna, 2004). Consistent with past research, pre-service teachers in the current study had more unfavorable attitudes toward working with the child with ADHD/HI compared to the children with SCT and SA. This was expected considering

that behaviors associated with ADHD tend to disrupt classroom learning goals and cause additional stress for teachers (Kauffman et al., 1989; Kos, Richdale, & Hay, 2006; Li, 1985; Watabe et al., 2014). In addition, students with ADHD often require extra teaching time and effort from teachers (Atkinson, Robinson, & Shute, 1997; Kos et al., 2006), and this could negatively influence teachers' attitudes toward students with ADHD.

Less is known about teachers' attitudes toward working with children with SA and SCT. In the current study, pre-service teachers had more favorable attitudes toward working with the child with SA compared to the child with SCT. This is likely a reflection of participants' perceptions of how problematic SA and SCT behaviors can be. Because SA behaviors were viewed as the least problematic, it seems reasonable that pre-service teachers would have more favorable attitudes about working with students with SA. Further, a student with SCT likely requires more effort from the teacher in order to keep the student engaged and on pace with the class.

Interestingly, pre-service teachers indicated that they would be the most likely to refer the child with SA to a school psychologist or school counselor. This result was unexpected, as past research has indicated that teachers perceive a less favorable prognosis for externalizing behaviors as compared to internalizing behaviors (DeStefano et al., 1977). Therefore it is possible that teachers may expect externalizing behaviors to require more intensive intervention. Consistent with this past research, pre-service teachers in the current study indicated that the child with ADHD/HI would be the most likely to benefit from an IEP or 504 Plan. This pattern of results regarding potential interventions may seem contradictory at first. However, it may reflect a belief that

different problematic behaviors require different interventions. For example, treatment of SA typically involves interventions such as social skills training and exposure, which are delivered by a trained professional rather than the classroom teacher (Beidel, Turner, & Morris, 2000; Spence, Donovan, & Brechman-Toussaint, 2000). Thus, teachers may perceive children with SA as needing a counseling intervention as opposed to classroom-based interventions. In contrast, teachers may perceive children with ADHD as requiring classroom-based behavioral interventions rather than counseling. These classroom interventions may include modifying classroom instructions, providing positive and negative consequences, and implementing a daily report card system (Abramowitz & O'Leary, 1991; Pfiffner, Barkley, & DuPaul, 1998).

Next, as expected, pre-service teachers indicated having the most knowledge about ADHD, followed by SP, and the least about SCT. Despite the fact that pre-service teachers had less knowledge of SCT relative to ADHD and SA, it is interesting that they were equally concerned about SCT as ADHD and SA. Perhaps this finding could be explained by participants' reported perceptions of SCT; many participants attributed SCT symptoms to a learning disorder, depression, ADD/ADHD, or more serious familial problems at home. Further, as expected based on participants' reported knowledge, the majority of participants correctly identified the child with ADHD (76%). Approximately one third of participants labeled SA as a type of anxiety disorder (31%). On the other hand, no one correctly identified SCT. These results are consistent with previous research suggesting that teachers might be better at identifying externalizing problems compared to internalizing problems (DeStefano et al., 1977; Kauffman et al., 1989; Watabe et al.,

2014). However, it is also important to note that the state of Iowa adopts a non-categorical approach to diagnosis and special education in the schools. This means that students are not diagnosed or classified based on a specific diagnostic label. Therefore, in the current study, it may be less important that pre-service teachers accurately identified the disorders presented considering that students are not actually classified by specific diagnoses. It is possible that Iowa, in particular, does not train teachers to differentiate one disorder from another; rather, teachers may be trained to identify students who are not meeting the educational or social-emotional standards in the classroom.

Although ADHD and SA are better known among the general public (Herbert et al., 2004), research indicates that teachers lack the opportunity to formally learn about childhood psychopathology (Anderson et al., 2012; Bekle, 2004; Herbert et al., 2004; Jerome et al., 1994; Kos et al., 2004). Rather, teachers appear to learn more about childhood psychopathology through their direct experiences working with students who have mental health problems (Anderson et al., 2012; Bekle, 2004; Kos et al., 2004). Considering that ADHD is one of the most common disorders in childhood, it seems likely that teachers would have the most experience with and knowledge of ADHD. The current study supports this notion, as 76% of participants correctly identified the child with ADHD/HI. However, teachers have much less experience with and knowledge of newer and uncommon childhood disorders, including SCT.

Further, considering that experience with children is related to teachers' knowledge of childhood disorders (Anderson et al., 2012; Bekle, 2004; Kos et al., 2004), it was expected that participants' experience would be related to more accurate ratings of

ADHD, SA, and SCT. It was also expected that participants with greater experience would be more likely to refer all three children to a school psychologist or school counselor. Experience was defined by both student teaching in the classroom and taking courses about childhood psychopathology. Somewhat surprisingly, experience did not appear to influence pre-service teachers' ratings in the current study. Experience was measured in a rudimentary way, and perhaps could be better explored in future studies. Participants indicated having an average of 2.65 semesters of experience observing in a classroom or student teaching, and reported taking few courses that covered childhood psychopathology (M = 2.55 courses). Approximately 38% of participants also indicated they were receiving a special education endorsement. It is difficult to determine the degree to which childhood psychopathology was covered in these courses, and what is covered in the course of a special education endorsement. Compared to practicing teachers, pre-service teachers do not have much experience at this point in their careers. Therefore, it is not surprising that their limited experience did not influence ratings in the current study. However, the current study does raise an important question regarding the training of pre-service teachers in childhood psychopathology and classroom management techniques. It is important for teachers to learn more about childhood psychopathology generally, and SCT specifically, to ensure that these children are receiving the necessary services to succeed in school. This is especially important for less common disorders, and highlights a need for more structured opportunities for teachers to learn about childhood disorders that do not involve direct experience in the classroom.

In addition to the concern ratings for each child answered after the vignette was read, participants were asked at the end of the survey to choose the child for whom they were most concerned. It was expected that participants would be the most concerned overall about the child with ADHD/HI, however, the majority of participants (49%) reported being the most concerned about the child with SCT. Fewer participants reported being the most concerned about the children with ADHD/HI (24%) and SA (27%). These results somewhat contradict the findings discussed above, such that all behaviors were rated as equally concerning, the child with ADHD/HI was viewed as more problematic and more likely to benefit from an IEP, and the child with SA was more likely to be referred to a school psychologist. Despite this seeming contradiction, the concern for the child with SCT can be partially explained by the qualitative reasons given by participants. The majority of participants reported they were the most concerned about the child with SCT for reasons such as his inability to concentrate and focus in class, which increases the likelihood of this student falling behind in classes. Poulou and Norwhich (2000) found that elementary school teachers viewed "lack of concentration" as more problematic than "excessive shyness" and "attention seeking" behaviors in the classroom. The current results may represent a promising shift of teachers' concern toward children's emotional difficulties.

Further, the current results could also be explained by teachers' familiarity with ADHD and SA. Perhaps because teachers are more familiar with and knowledgeable about ADHD and SA, these behaviors may be viewed as more easily managed and treated compared to SCT behaviors that do not, in teachers' minds, have an apparent

cause or an easy fix. Many participants attributed SCT behaviors to potential difficulties at home, yet parents have been identified as a perceived barrier to classroom-based mental health services for children (Williams, Horvath, Wei, Van Dorn, & Jonson-Reid, 2007). Therefore, pre-service teachers may have been the most concerned about the child with SCT because it would require intervention in the child's home life as well as more involvement from the child's parents. In contrast, ADHD and SA may be viewed as more easily treated in a school setting.

Implications

Overall, the results from the current study are promising. Pre-service teachers appear to be able to recognize, as well as demonstrate appropriate concern for, a variety of mental health symptoms in the classroom. In addition, pre-service teachers were not only concerned about externalizing behaviors, but also about internalizing and non-hyperactive behaviors, such as those associated with SCT and SA. This finding is inconsistent with past research documenting that teachers tend to be most concerned and worried about externalizing and disruptive behaviors in the classroom (DeStefano et al., 1977; Kauffman et al., 1989). The current results indicate that teachers are also able to recognize and identify children struggling with internalizing or less disruptive behaviors. This is hopeful for children with SCT, because these children may not be 'falling through the cracks' in schools as was hypothesized.

It is important for teachers to be able to identify all children who are not meeting the high-tempo demands in the classroom because these children are more likely to develop stress, putting them at a higher risk for the development of anxiety symptoms

(Lundervold, Posserud, Ullebo, Sorensen, & Gillberg, 2013). Early intervention is key for preventing future problems and reducing associated impairment (Conduct Prevention Research Group, 1992; National Advisory Mental Health Council Workgroup on Child and Adolescent Mental Health Intervention Development and Deployment, 2001; Norman & Malla, 2001). This study provides preliminary evidence that children with SCT may be identified by teachers, despite teachers' lack of knowledge about SCT specifically. Unfortunately, pre-service teachers were not always accurate in identifying specific mental health diagnoses. In particular, participants reported very little knowledge about SCT relative to ADHD and SA, and many attributed SCT symptoms to a learning disorder, depression, or problems at home. These results highlight the need to better educate teachers about childhood psychopathology generally and SCT specifically. Increased knowledge about childhood psychopathology would enable teachers to refer students for the most appropriate interventions given their respective diagnoses.

The current results support the notion that teachers are in a good position to be first line identifiers of mental health concerns in schools. Even though pre-service teachers have limited knowledge of and experience with childhood psychopathology, they still appear to be able to recognize children in the classroom who are struggling with mental health problems. This is important because schools are an ideal place to screen for and identify child psychopathology (Committee on School Health, 2004; Herbert et al., 2004), and the benefits associated with school-based mental health programs are abundant. School-based mental health programs help improve access to diagnosis and treatment, eliminate the need for transportation to and from appointments, reduce stigma

associated with mental health treatment, encourage parent involvement in treatment, and increase the generalization and maintenance of treatment (Committee on School Health, 2004; Paternite, 2005).

Although it is important to promote teachers' knowledge of childhood psychopathology and school-based mental health, teachers still face some obstacles that may inhibit their ability to provide early identification of and referrals for emotional and behavioral problems in childhood (Herbert et al., 2004; Goldring et al., 2013; National Education Association, 2013). Teachers are faced with the responsibility of maintaining a positive learning environment for the entire classroom, which may contain upwards of 25 students (National Education Association, 2013). Perhaps the identification of mental health concerns of individual children may be low on teachers' priority list compared to other obligations. In addition, it may not be feasible to add full mental health training into the current teacher curriculum.

Thus, one cannot rule out the role of parents in the identification of childhood psychopathology. Parents spend more one-on-one time with their children, and perhaps differences in the demands of the home versus school environments could differentially affect parents' perceptions of childhood psychopathology. It is possible that SCT symptoms, in particular, may be more noticeable and frustrating for parents than teachers (Watabe et al., 2014). For example, daydreaming and sluggishness during interpersonal interactions, homework time, or completion of chores likely enhances parents' perceptions of impaired functioning associated with SCT. Thus, parents of children with

SCT have the opportunity to serve as advocates for their children in order to ensure they do not 'fall through the cracks' at school.

Pediatricians and school psychologists also have the potential to play a valuable role in the identification of childhood psychopathology. Both pediatricians and school psychologists have access to a variety of screening tools that can be used to assess social-emotional problems and psychopathology in childhood (Carter, Briggs-Gowan, & Davis, 2004; Glascoe, 2005; Huffman & Nichols, 2004). Therefore the best approach to identifying and treating childhood psychopathology may be to improve collaboration among parents, teachers, psychologists, and pediatricians. Perhaps it is less important for teachers to be able to identify specific disorders; rather, it is the teacher's job to recognize when a problem is present and to refer that child to a mental health professional for evaluation and diagnosis. Therefore, it may be more appropriate to add consultation courses into the teacher training curriculum, so that teachers can become more knowledgeable regarding the processes of referring and treating children with mental health concerns. One method that has promising evidence is conjoint behavioral consultation, which promotes collaboration between a child's home and school (Clarke, Sheridan, & Woods, 2014; Sheridan & Kratochwill, 2008). Because a child's home and school environments are both critical and essential learning environments, a strong collaboration between the two can contribute to the optimal development of a child's academic, behavioral, and social-emotional skills (Sheridan & Kratochwill, 2008).

Limitations

Although the results of the current study are promising in terms of the identification of mental health concerns by teachers, there are limitations that should be noted. The current sample consisted primarily of female education majors from one midwestern university. Participants' race and ethnicity were not collected in the current study. However, based on the demographics of the university, it is expected that the sample was predominantly Caucasian. In addition, the current study surveyed only pre-service teachers' attitudes and perceptions of mental health in the classroom. Therefore there is no way of knowing whether the results of the current study would be generalized to practicing teachers, male teachers, or teachers from other parts of the United States. On the other hand, these sample characteristics could also be considered a strength, as it is equally important to study the attitudes and perceptions of pre-service teachers who are still in the process of becoming trained. It is important to determine areas of weakness within the teacher training curriculum to help better educate teachers in the area of mental health identification.

In addition, the three vignettes used in the current study may not be realistic representations of a classroom setting. The three vignettes were comparable on factors such as academic underachievement and poor social skills. For each child, six symptoms were described in addition to one positive quality. Therefore, in an attempt to control for the severity of the vignettes, all three vignettes may have sounded concerning to pre-service teachers. In particular, it was noted that all three children were struggling academically, which may have caught pre-service teachers' attention; this may partially

explain why participants were concerned about all three children. Further, unlike a classroom setting, the current vignettes examined each child independently. It possible that a child with SCT could get 'lost' in the classroom if they are in a class with other students displaying more externalizing and disruptive behaviors. Comparatively, SCT may appear less concerning than ADHD in an actual classroom setting, and it is possible that SCT symptoms could go unnoticed. It is difficult to conclude the degree to which the current results are representative of how practicing teachers actually identify and refer students with mental health concerns.

Another limitation is that the measure used in the current study was created by the researcher for the purposes of this study. One flaw with the current measure is that the term "concern" was used for multiple questions. Participants were asked to rate their level of concern for each child individually as well as to indicate the child whom they were the most concerned about. This may have been confusing to participants, and also led to somewhat contradictory results in the current study. The variable "concern" was not concretely defined in the current study, and this issue should be addressed in future studies so that researchers can reach a better conclusion regarding which behaviors teachers are most concerned about. In addition, there is also limited data on the reliability and validity of the measure. Analysis of the internal consistency of the measure indicated high internal consistency, suggesting that the vignette items are tapping into the same general construct. It is, however, still possible that the current measure did not accurately measure pre-service teachers' concerns for children presenting with mental health concerns.

Future Directions

Future studies should aim to correct the limitations of the current study by sampling a more diverse collection of teachers, including in-service teachers and teachers in other states. It would be interesting to replicate the current study in other states that adopt a categorical approach to diagnosis in the schools. In addition, future studies should attempt to capture a more realistic representation of mental health in the classroom. The vignettes used in the current study included very brief and fairly negative descriptions of the three children. Future studies may want to address this limitation by including more positive characteristics about each child, such as good or average grades and better social skills. This would eliminate potential confounds related to concerns about the children's grades and poor social skills. A more accurate portrayal of mental health in the classroom could also be established by creating video clips of children presenting with symptoms. Future investigators should also compare teachers' perceptions and attitudes of SCT to other childhood disorders, including depression and specific learning disorders, as well as a control condition with no discernible diagnosis. This would help researchers better understand whether teachers are able to distinguish between truly concerning and not concerning behaviors. It would also highlight whether more training is needed in order for teachers to identify SCT specifically, or childhood psychopathology generally.

It would also be important to better understand the role of experience in teachers' perceptions of mental health in the classroom, which could be measured differently in future studies. It is possible that individuals with limited experience would simply refer any child who presents with atypical behaviors, whether or not a referral is actually

warranted. Therefore, higher rates of referral could be related to either high or low levels of experience. Future studies should better examine the relation between experience and rates of referral, as well as the accuracy of referral. It would be expected that individuals with greater experience would have more informed and accurate referrals compared to individuals with less experience.

It may also be interesting to examine a group of current or potential parents' attitudes and perceptions of childhood psychopathology generally, and SCT specifically. As discussed above, parents may have different attitudes toward and perceptions of childhood psychopathology due to differences in the demands of the home versus school environments. Future studies should compare differences among parents' and teachers' attitudes and perceptions of SCT specifically. This would provide important information regarding how best to identify children with SCT so that they get the attention they need.

More research is also needed to better define and understand SCT and related impairment in children. In particular, future studies should look at motivation in relation to SCT in order to better tease these two constructs apart. At this point, it is difficult to conclude whether SCT is simply a result of a lack of motivation and initiative. Researchers should also examine the external and internal correlates of SCT, as well as any associated functional impairment deficits. Finally, SCT-specific treatments are needed to ensure the success of children with this novel condition.

Overall Conclusion

Sluggish Cognitive Tempo (SCT) is a relatively new symptom cluster related to mental fogginess and sluggishness, and is associated with many internalizing, academic,

and social difficulties (Becker & Langberg, 2013, 2014). Due to the nature of SCT symptoms, it is possible that these symptoms may go unrecognized in the classroom. The current study aimed to examine pre-service teachers' knowledge and perceptions of SCT relative to two more well-known childhood disorders, Attention-Deficit/Hyperactivity Disorder (ADHD) and Social Anxiety Disorder (SA). The results of the current study are promising, and suggest that pre-service teachers are concerned about both hyperactive behavioral problems in childhood (i.e., ADHD) and non-hyperactive behavioral problems (i.e., SCT and SA). The current study provides preliminary evidence that teachers may be able to recognize and identify children presenting with SCT symptoms, as they demonstrated high levels of concern for this child despite their lack of knowledge of SCT. However, pre-service teachers differed in the types of referrals and interventions they recommended for children with different symptoms. This highlights the need to better educate pre-service teachers about childhood psychopathology generally, and SCT specifically. Promoting mental health is an essential component in academic success as well as social and emotional development in children. More research is certainly warranted with regard to the identification and treatment of SCT in the classroom.

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APPENDIX A

Table 1

Participant Characteristics

Variable	Total	Percentage	Mean (SD)
Gender			
Male	13	8.1%	
Female	148	91.9%	
Age			19.73 (1.98)
18	48	29.8%	
19	41	25.5%	
20	26	16.1%	
21	25	15.5%	
22	12	7.5%	
23+	9	5.5%	
Grade Level			
Freshman	52	32.3%	
Sophomore	40	24.8%	
Junior	26	16.1%	
Senior	42	26.1%	
Semesters in the Classroom			2.65 (1.43)
0	46	28.6%	
1	38	23.6%	
2	31	19.3%	
3	19	11.8%	
4+	27	16.8%	
Special Education Endorsement			
Yes	61	37.9%	
No	100	62.1%	
Psychopathology Classes			2.55 (1.22)
0	42	26.1%	
1	36	22.4%	
2	44	27.3%	
3	30	18.6%	
4+	9	5.6%	

APPENDIX B

Table 2

Cronbach's Alphas

	Cronbach's Alpha
Entire Measure	0.83
ADHD Only	0.75
SCT Only	0.74
SA Only	0.73

APPENDIX C

Table 3

Repeated Measures ANOVA Outcomes and T-Tests for Hypotheses 1-3

	Means (SD)	F value	P value	Partial Eta squared
Problematic		17.24	< .001	.10
ADHD	4.39 (0.95)[a]			
SCT	4.07 (1.02)[b]			
SA	3.81 (1.17)[c]			
Unfavorability		29.35	< .001	.17
ADHD	3.22 (0.88)[a]			
SCT	2.92 (0.77)[b]			
SA	2.65 (0.86)[c]			
Concern		1.94	.145	.01
ADHD	4.33 (1.02)[a]			
SCT	4.43 (0.87)[a]			
SA	4.27 (1.06)[a]			
Referral		16.32	< .001	.097
ADHD	3.90 (1.31)[a]			
SCT	4.07 (1.14)[a]			
SA	4.50 (1.09)[b]			
IEP/504 Plan		12.11	< .001	.07
ADHD	4.30 (1.29)[a]			
SCT	3.96 (1.24)[b]			
SA	3.70 (1.36)[b]			
Knowledge		314.76	< .001	.68
ADHD	3.54 (0.79)[a]			
SCT	1.42 (0.65)[b]			
SA	2.48 (1.03)[c]			

Note. Means with similar super scripts are not statistically different from each other; means with different superscripts are significantly different from each other based on planned comparisons. Scores range from 1 to 6 for the Problematic, Unfavorability, Concern, Referral, and IEP/504 Plan variables, with high scores indicating higher levels of concern and higher rates of referral. The Knowledge scores range from 1 to 5, with higher scores indicating more knowledge.

APPENDIX D

INSTRUCTIONS AND SLUGGISH COGNITIVE TEMPO VIGNETTE

For the purpose of this study, please imagine that you are a fourth grade teacher. You will read three different stories that describe three boys in your fourth grade classroom. Please read through each story and answer the questions that follow. You will be deciding whether the presenting behaviors warrant further attention. The same recommendations and interventions may be appropriate for each child, or each may be different.

Ben is a student who seems to be off in his own world. He is generally well behaved at school but he does not have many friends. During class you frequently catch him staring off into space and daydreaming. He has fallen asleep in class on several occasions. Most times when you call on him in class, you have to repeat the question and it seems to take him an extra second to process what you are asking. He is always one of the last students to complete assignments and tests. His grades are below average, but he is not failing. At recess, he does not run and play with the other children in the class.

APPENDIX E

ATTENTION-DEFICIT/HYPERACTIVITY DISORDER-PREDOMINANTLY HYPERACTIVE/IMPULSIVE TYPE VIGNETTE

Alex is a student who is usually eager to please his teacher. However, other students often get frustrated with Alex because he is always on the go and never seems to take a break. He quickly loses interest in activities and games during free time and recess, and is constantly darting from one activity to the next. He has a hard time sitting still during class and he is always squirming and fidgeting in his seat. In addition, he talks out of turn a lot and often yells out the answers before other students have a chance to raise their hands. He has below average grades.

APPENDIX F

SOCIAL ANXIETY VIGNETTE

Jake follows directions in the classroom, but he does not have many friends at school. He avoids social situations, such as talking and playing with his peers and participating in after school activities. He gets extremely nervous when he has to socialize with others, and often does not contribute to the conversation. His grades are below average, and he tries to avoid the required class presentations. In addition, he never raises his hand in class to answer a question and he freezes up whenever he is called on to read in front of the class. His mother reports that he is afraid of being embarrassed, judged, and rejected by others.

APPENDIX G

VIGNETTE QUESTIONNAIRE

Each of the following 7 questions will appear after each vignette:

1. How would you feel about having this child in your classroom?

1	2	3	4	5	6
Extremely Favorable					Extremely Unfavorable

2. In your opinion, to what degree do you see these behaviors as being problematic?

1	2	3	4	5	6
Not At All Problematic					Extremely Problematic

3. How concerned are you about these behaviors?

1	2	3	4	5	6
Not At All Concerned					Extremely Concerned

4. How likely would you be to discuss this child's behavior with his parents?

1	2	3	4	5	6
Extremely Unlikely					Extremely Likely

5. How likely is it that this child would benefit from intensive supplemental services (i.e., Individualized Education Program or 504 Plan)?

1	2	3	4	5	6
Extremely Unlikely					Extremely Likely

6. How likely would you be to refer this child to the school psychologist or school counselor?

1	2	3	4	5	6
Extremely Unlikely					Extremely Likely

7. What would say is the diagnosis, if any, of this child?

   _____

***Then participants will then see this one question after the three vignettes:**

Which child are you most concerned about?

- ☐ Ben, who is sluggish and has difficulty concentrating
- ☐ Alex, who is always on the go and can't sit still during class
- ☐ Jake, who is really shy and doesn't participate in class

Why are you the most concerned about this child?

_____

APPENDIX H

DEMOGRAPHICS QUESTIONNAIRE

1. Age: _____

2. Gender: _____

3. Education level:
   - ☐ Freshman
   - ☐ Sophomore
   - ☐ Junior
   - ☐ Senior

4. How many semesters have you spent in the classroom, either observing or student teaching?
   - ☐ 0
   - ☐ 1
   - ☐ 2
   - ☐ 3
   - ☐ 4+ (How many? _____)

5. Are you planning to get a special education endorsement?
   - ☐ Yes
   - ☐ No

6. How many classes have you taken that have discussed childhood mental health and behavioral problems?
   - ☐ 0
   - ☐ 1
   - ☐ 2
   - ☐ 3
   - ☐ 4+ (How many? _____)

   Which disorders have you learned about?
   - ☐ ADHD (or ADD)
   - ☐ Oppositional Defiant Disorder
   - ☐ Autism/Asperger's
   - ☐ Conduct Disorder
   - ☐ Social Phobia/Social Anxiety Disorder
   - ☐ Anxiety
   - ☐ Depression
   - ☐ Learning Disability
   - ☐ Intellectual Disability
   - ☐ Developmental Disability
   - ☐ Other: _____

7. Would you like to receive more training on recognizing and responding to childhood disorders?
   ☐ Yes
   ☐ No

As you may have gathered by now, the stories described three boys struggling with psychological problems. Please rate how much you know about each of the following issues.

1. How much do you know about ADHD?

1	2	3	4	5
Nothing		Some		A Lot

2. How much do you know about Social Phobia?

1	2	3	4	5
Nothing		Some		A Lot

3. How much do you know about Sluggish Cognitive Tempo?

1	2	3	4	5
Nothing		Some		A Lot