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ADHD Symptoms

Objective Performance and Subject Perspective

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Abstract

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ADHD research has mainly focused on objective performance measures. Performance, however, is only one aspect of functioning. Other aspects of how individuals function are their personal experiences and their evaluations of those experiences. The aim of this thesis is to expand knowledge on the topic of ADHD by presenting studies that investigate objective performance and subject perspective, simultaneously. The empirical work presented here has a dimensional approach to ADHD, which is reflected in the use of samples selected to represent a wide variation in ADHD symptoms. Herein, both objective performance and subject perspective are conceptualized in various ways, to address unanswered questions and to question previous research.

ADHD is related to underperformance within the academic realm and within the social realm. By introducing novel subject perspective measures, and including objective performance measures in new ways, a more nuanced understanding of these underperformance areas was gained. More specifically, we obtained an overview of the influence of ADHD symptoms in late childhood and adolescence in relation to academic performance by studying a longitudinal framework of concomitant factors. Furthermore, we disentangled the interplay of ADHD and ODD symptoms and cognitive performance in predicting social acceptance and the "positive illusory bias". Additionally, we questioned the link between disorganized attachment representations and ADHD symptoms by investigating the potential relationship between attachment representations and ADHD symptoms, whilst considering concurrent conduct problems, cognitive performance and narrative responses to non-attachment related story stems.

Main results indicate that academic performance is influenced by ADHD symptoms and previous academic performance; adolescent self-perceptions of academic competence are negligible in this context. Moreover, ADHD symptoms in adolescence have a negative influence on views of the future, beyond academic performance and parental education. Further, results indicate that positive illusory bias relates more to ODD behaviors. Finally, results also indicate that children with high levels of ADHD symptoms could falsely appear to be disorganized due to a propensity to include negative content in narratives. In conclusion, when studied together, objective performance and subject perspective give new insight into ADHD. The findings presented motivate the simultaneous inclusion of different perspectives of functioning in ADHD research.

Keywords: ADHD, developmental psychology, academic performance, future orientation, cognitive performance, positive illusory bias, attachment representations

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To my mother Eva

List of Papers

This thesis is based on the following papers, each of which is the product of the study referred to in the text with the corresponding Roman numeral:

- I Scholtens, S., Rydell, A-M., & Yang-Wallentin, F. (2013) ADHD symptoms, academic achievement, self-perception of academic competence and future orientation: A longitudinal study. *Scandinavian Journal of Psychology*, 54(3), 205-212.
- II Scholtens, S., Diamantopoulou, S., Tillman, C. M., & Rydell, A-M. (2012). Effects of symptoms of ADHD, ODD, and cognitive functioning on social acceptance and the positive illusory bias in children. *Journal of Attention Disorders*, 16(8), 685-696.
- III Scholtens, S., Rydell, A-M., Bohlin, G., & Thorell, L. B. (2014). ADHD symptoms and attachment representations: Considering the role of conduct problems, cognitive deficits and narrative responses in non-attachment-related story stems. *Journal of Abnormal Child Psychology*, 42(6), 1033-1042.

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Abbreviations

ADHD	Attention Deficit Hyperactivity Disorder
ANCOVA	Analysis of Covariance
CAI	Child Attachment Interview
CD	Conduct Disorder
CPT	Continuous Performance Test
DSM	Diagnostic and Statistical Manual
FO	Future Orientation
GFI	Goodness of Fit Index
NFI	Normal Fit Index
ODD	Oppositional Defiant Disorder
PIB	Positive Illusory Bias
RMSEA	Root Mean Square Error of Approximation
SEM	Structural Equation Model
SES	Socioeconomic Status

Introduction

What you see and what you hear depends a great deal on where you are standing. It also depends on what sort of person you are.

C.S. Lewis, *The Magician's Nephew*

Attention Deficit Hyperactivity Disorder (ADHD) is the most researched neuropsychological disorder in children. Research within this field has mainly focused on objective performance measures. It has for example been well established that ADHD symptoms are related to poorer cognitive performance and poorer academic performance. Performance, however, is only one aspect of functioning. Other aspects of how individuals function in the world are their personal experiences and their evaluations of those experiences (Diener, 2009). In recognition of this, a growing body of ADHD research has turned to investigating associations between ADHD symptoms and the perspective of those being studied. In this emerging literature, researchers use measures that aim to capture the vantage point of the individual being studied, and those individuals' subjective evaluations of their reality. ADHD symptoms have been empirically related to various conceptualizations of the subject's perspective, such as self-perceptions and attachment representations; however, the specifics of many of these associations remain unclear.

The aim of this thesis is to expand knowledge on the topic of ADHD by presenting studies that investigate objective performance and subject perspective simultaneously. The results of the three empirical studies included in this thesis show that, when studied together, objective performance and subject perspective can give unique insight into ADHD symptomology. It is hoped that this finding will further motivate the simultaneous inclusion of different perspectives of functioning in ADHD research and encourage the further development of multifaceted outcome measures.

First, I would like to offer a few words on my understanding of ADHD. Despite the vast amount of research on ADHD, and an increase in familiarization with the term, much of the public remains poorly informed about the disorder (Moldavsky & Sayal, 2013). As an example, a little over a decade ago, in the U.S., 65% of the respondents to the "2002 National Stigma Study

– Children” had heard of ADHD and most of these could not provide detailed information about the disorder (McLeod, Fettes, Jensen, Pescosolido, & Martin, 2007). Among those in the study who had heard of ADHD, approximately 20% did not believe the disorder to be real. More recently, in a community sample of high and low risk ADHD adolescents, Bussing et al. (2012) found that familiarity ratings were 93% for adolescents and 98% for parents. However, even with these high self-knowledge ratings, respondents had considerable misperceptions about ADHD; for example, approximately 25% of the respondents believed that ADHD was simply an immediate side effect of sugar intake. Such gaps in general knowledge and skepticism towards the pharmaceutical treatment of children have fueled a heated public debate questioning the very existence of ADHD as a “true” neuropsychological phenomenon (Singh, 2008).

The diagnostic criteria for ADHD and their symptom descriptions are arguably imprecise and absolutely ambiguous. At the same time, it is important to understand that the current definition and diagnostic criteria of ADHD rest on a large corpus of research and their ongoing development is not haphazard. In line with much of the scientific community (International consensus statement, Barkley et al., 2002), this thesis rests on the understanding that ADHD does exist. All of the complexities that combine to create the condition now called ADHD have not been sorted out, there is as yet no explanation for what causes every instance of ADHD, but it is a misconception that all ADHD is pseudo-ADHD. And as the stigma and suffering associated with ADHD are very real (Harpin, 2005; Lebowitz, 2013; Moldavsky & Sayal, 2013), a greater understanding of how ADHD symptomatology relates to performance *and* subjective experience is essential.

Before proceeding to the empirical studies, the rationale and basic premises of the thesis are presented. ADHD is then defined via its predominant, contemporary mode of assessment, and a selective overview of some of what is known about ADHD is provided. The topics covered in this overview section were selected to serve as a general background to the empirical studies and our approach to researching ADHD. Subsequently, three areas of interest are presented which lead to three research questions left to answer with regard to ADHD. The participants, procedures and measures of the three empirical studies are then accounted for in a methods section, which is followed by the more detailed background, aims, results and conclusions of each separate study. Finally, a general discussion of the key empirical results and the conclusions that can be drawn from them taken together are presented.

Performance Measured “Objectively” and Capturing the Subject’s Perspective

Central to the rationale of this thesis is the simple and straightforward definition of “performance” found in *The Oxford English Dictionary* (Stevenson, 2010). According to this definition, performance is “the action or process of carrying out a task or function”. Within the field of psychology one will find an exceptionally wide array of performance tests. These performance tests often evaluate task success in terms of explicitly predefined parameters, set and/or evaluated by an external source. These evaluations strive to be objective, i.e. free from bias, however, it should be recognized that they all fulfill this goal to a varying degree (Kaplan & Saccuzzo, 2012). Herein, the distinction “objective performance” is used to emphasize the external, on-looker, pre-defined evaluations of performance embedded in popular measures used to assess performance. Importantly, the use of “objective” here is not in any way a declaration of freedom of bias.

As mentioned earlier, when striving to gain a greater understanding of ADHD, research to date has mainly focused on objective performance. This is not surprising; externally assessing performance has long preoccupied man. As early as during the Han Dynasty (206 B.C.E to 220 C.E) it was common in China to use performance test batteries for entrance into the civil service (Kaplan & Saccuzzo, 2012). The desire to quantify performance accelerated in Europe throughout the 19th century. During this same time period, the newly emerged quantitative worldview also found its way into the sphere of psychology and the field of “psychological” performance testing took shape (Madaus & O’Dwyer, 1999).

Again, research must go beyond this focus on objective performance evaluations to more fully understand functioning. How well someone performs does not paint a complete picture of well-being or life course development (Ryan & Deci, 2001; Ryff, 2014). The individual’s personal experiences and their subjective evaluations of those experiences also help shape how they function in the world (Diener, 2009). That which I refer to here as “subject perspective” is at the most basic level the investigation of the perspective of the individual being studied, something that can be conceptualized in various ways. Any type of self-report gives insight into the perspective of those being studied. The field of psychology also offers more encompassing measures of subject perspective, for example subjective-evaluation constructs or constructs that tap into mental models or so-called “frames of mind”.

Investigations of how individuals view themselves and the world around them have already proved to have a lot to offer ADHD research and, to my mind, subject perspective is a necessary area of interest for those wanting to gain a greater understanding of ADHD symptomology. For one thing, subject perspective could elucidate objective performance. It is possible that

relationships between ADHD symptoms and performance could to some extent be explained by the individual's perspective. And secondly, objective performance measures have the potential to inform us about relations between ADHD and subject perspective. How behavioral symptoms relate to subject perspective could very well be intertwined with the individual's performance level. For these reasons this thesis aims to expand knowledge of ADHD by presenting studies that *simultaneously* investigate objective performance and subject perspective in relation to ADHD symptoms; the greater aspiration here being to add a facet to current research and contribute to making it more participant-perspective inclusive.

ADHD Assessment: Defining the Disorder

Often thought of as an invention of modern times, ADHD has in fact long been recognized as a clinical entity. Descriptions of hyperactive and inattentive children have been found from as early as the 1800s, with many attributing the modern understanding of ADHD to George Frederick Still's descriptions of problem behaviors in lectures he held in 1901 (Taylor, 2011). During the past 60 years, the scientific community has used various terms to describe the disorder that we now call ADHD, e.g. minimal brain dysfunction, hyperkinetic impulse disorder, hyperactivity, and attention deficit disorder (Mash & Barkley, 2009). These terminological differences reflect various conceptions of core symptoms and presumptive pathophysiologies of the disorder. Historical accounts of the antecedents of ADHD and the changing diagnostic properties of the disorder implore us to recognize the fluidity of the conceptualization of the disorder.

The "gold standard" diagnosis refers to accepted proof that a patient does or does not have the target disorder (Waller et al., 2013). Ideally the "gold standard" provides unquestionable criteria not requiring interpretation (e.g. a laboratory test) or a clinical standard for diagnosis that requires very little interpretation (e.g. an imaging technique). Such gold standards do not exist for mental disorders, including ADHD. Instead, diagnosis of ADHD is based on interpretations of descriptions of behavior, coupled with the course, history, and knowledge of differential diagnoses.

When defining ADHD, research in the last 15 years has predominantly used the diagnostic criteria found in the text revision of the American Psychiatric Association's 4th Diagnostic and Statistical Manual (DSM-IV-TR, American Psychiatric Association, 2000; Mash & Barkley, 2009). This authoritative, "silver standard" guide was developed by researchers and clinicians with the goal of providing clear, valid, and up-to-date guidelines for the standard classification of ADHD and other mental disorders. DSM-IV-TR (American Psychiatric Association, 2000) lists a total of 18 ADHD symptoms, which are categorized as belonging to either the symptom do-

mains of “inattention” or “hyperactivity/impulsivity” (nine symptoms in each category). These domains are separate but highly correlated. Symptoms of inattention are characterized by behaviors such as making careless mistakes, forgetfulness, difficulty organizing tasks, being easily distracted and failure to begin or complete tasks that require attention. Symptoms of hyperactivity/impulsivity are characterized by behaviors such as fidgeting with hands or feet, failure to sit still when required, talking excessively, interrupting or intruding on others and having difficulty awaiting one’s turn.

An ADHD diagnosis according to DSM-IV-TR requires that six or more symptoms from one symptom domain must be present “often” for at least six months, must be inappropriate for the individual’s developmental level, must interfere with functioning, must be evident before seven years of age, must be present across settings (e.g. at home and at school), and must not be due to another disorder. DSM-IV-TR defines three diagnostic subtypes based on which symptom domain the individual’s symptoms lie within: the inattentive subtype (six or more symptoms of inattention), the hyperactive/impulsive subtype (six or more symptoms of hyperactivity/impulsivity) and the combined subtype (six or more from both symptom domains). The DSM-IV-TR model of ADHD has been found to have adequate internal and external validity (Willcutt et al., 2012).

Alongside the diagnosis-focused ADHD research that has been carried out during the last decade and a half, empirical support has emerged for an alternative way of conceptualizing ADHD, as symptoms have been found to represent an extreme end of normal traits as opposed to a distinct category (for review Coghill & Sonuga-Barke, 2012). The dimensional conceptualization of ADHD will be presented in more detail below as all three of the empirical studies included in this thesis have this approach to ADHD. Measuring ADHD behavioral symptoms along a continuum is typically done using a norm-referenced rating scale that reflects the symptoms in DSM-IV-TR (i.e. the ADHD Rating Scale-IV; DuPaul, Thomas, & Anastopoulos, 1998).

It is worth noting that in the relatively newly released American Psychological Association’s 5th Diagnostic and Statistical Manual (DSM-5, 2013), the conceptualization of ADHD is similar to the one found in its direct predecessor. The same 18 symptoms are used and continue to be divided into the same two symptom domains. Moreover, child diagnosis still requires the presence of at least six symptoms within the same symptom domain. The main modifications pertaining to ADHD included in DSM-5 are: 1) more examples in the symptom description to ease application across the life span, 2) stronger emphasis on the cross-situational criterion, 3) age of onset criterion has been changed from age seven to age 12, 4) subtypes have been replaced by “presentation specifiers”, 5) a comorbid diagnosis with autism spectrum disorder is now allowed, and 6) addition of an adult-specific symptom threshold which requires five symptoms within either symptom domain.

Some of What We Know About ADHD

ADHD is among the most commonly diagnosed disorders in children (Barkley, 2006; Barkley, 1997b) and worldwide prevalence is estimated at approximately 5% (Willcutt, 2012). Originally considered to be limited to childhood, it is now widely recognized that symptoms can persist into adulthood (Fayyad et al., 2007; Simon, Czobor, Balint, Meszaros, & Bitter, 2009). ADHD symptoms are sometimes evident as early as the preschool years (Daley, Jones, Hutchings, & Thompson, 2009) and longitudinal studies indicate that ADHD identified in early childhood often persists through middle childhood, adolescence and adulthood (Barkley, Fischer, Smallish, & Fletcher, 2002; Barkley, Murphy, & Fischer, 2010; Kessler et al., 2005). Persistence rates into adulthood vary between 15%-65% depending on which model of retroactive diagnosis is used (Faraone, Biederman, & Mick, 2006). At present, the consensus is that ADHD is a dimensional disorder that is heterogeneous with a multifactorial etiology (Tarver, Daley, & Sayal, 2014). Below, I will address these issues, as they have been the backdrop of the empirical work presented here.

A Question of More or Less

ADHD is considered one of the most heritable psychiatric conditions, with heritability estimates of around 76% (Faraone et al., 2005). Meta-analysis of commonly studied candidate genes revealed moderate associations between ADHD and variants of the dopamine transporter (DAT1) and dopamine receptors (DRD4 and DRD5) and the serotonin transporter (5HTT) (Gizer, Ficks, & Waldman, 2009). However, no single genetic risk factor has been identified and implicated genetic risks tend to have small effect sizes (Thapar, Cooper, Eyre, & Langley, 2013).

Importantly, similar heritability estimates have been found at both ends of the range of ADHD symptoms, which gives support to the idea of ADHD being a dimensional disorder (e.g. Gjone, Stevenson, & Sundet, 1996; Levy, Hay, McStephen, Wood, & Waldman, 1997). A recent study of 8500 twin pairs found a strong genetic link at both the extreme and the clinical sub-threshold end of DSM-IV based ADHD (Larsson, Anckarsater, Råstam, Chang, & Lichtenstein, 2012). The results of this extensive study also further suggest that ADHD is best viewed dimensionally, as data showed that genetic and environmental factors operated throughout the ADHD symptom distribution.

Besides genetic studies, more support for an ADHD continuum can be found in studies showing a linear relationship between inhibitory function and ADHD-symptom severity (e.g. Sonuga-Barke, Dalen, Daley, & Remington, 2002; Sonuga-Barke, Dalen, & Remington, 2003). Additionally, many children that do not meet the full criteria for diagnosis experience neg-

ative consequences similar to children with diagnosis (Bauermeister et al., 2007). Also speaking for the dimensional view is the failure of taxonomic investigations of the latent structure of ADHD to find a discrete taxon (Frazier, Youngstrom, & Naugle, 2007; Haslam et al., 2006; Marcus & Barry, 2011). In sum, ADHD should be considered an extreme expression of normal variation, which makes it important for research to look at ADHD over a continuum and cover a wide distribution of symptoms (for reviews see Coghill & Sonuga-Barke, 2012; Kraemer, Noda, & O'Hara, 2004).

A Heterogeneous Disorder with a Multifactorial Etiology

ADHD is a heterogeneous disorder with a multifactorial etiology. There are variations in symptom presentation (subtypes), symptom degree, and symptom persistence. Variations in co-occurring disorders, cognitive functioning and associated impairments are also common (e.g. Barkley, 2006; Nigg, 2006). Research has not pinned down one single explanatory cause of ADHD symptomology. Both biological and environmental factors contribute independently to the disorder, and could potentially interact (Thapar et al., 2013).

Symptoms Not the Same – Not in the Moment or Over Time

As mentioned earlier, DSM-IV-TR (American Psychiatric Association, 2000) defines three diagnostic subtypes based on differential evaluations of the symptom dimensions. A diagnosed individual can present with symptoms from primarily either symptom domain, or both. However, research has found that an individual's symptoms can fluctuate between subtypes and the boundaries of these subtypes have been questioned (e.g. Carlson, Shin, & Booth, 1999; Gadow, DeVincent, & Pomeroy, 2006; Lahey, Pelham, Loney, Lee, & Willcutt, 2005; Willcutt et al., 2012).

Over time, a decrease in symptom severity is often reported for the hyperactivity/impulsivity symptom dimension (Biederman, Mick, & Faraone, 2000; Evans et al., 2013). Results for the inattention dimension are more inconsistent. Studies report both increases (Larsson, Dilshad, Lichtenstein, & Barker, 2011) and reductions in symptoms over time (Biederman et al., 2000; Evans et al., 2013). Döpfner et al. (2014) studied the long-term course of ADHD symptoms from childhood to early adulthood (seven years to 19 years old) in a community sample. This study identified low, moderate and high symptom-level trajectories, for each symptom domain separately, and for total amount of symptoms. The developmental course was stable for the high subgroups of inattention and total symptoms, although in general there was a decrease of symptoms with age.

Conclusively, ADHD-symptom constellations during the school years can appear different in the moment, and symptoms can vary in how they are manifested over time. One way to more fully capture the symptom constella-

tion that lies beneath an individual's presentation of ADHD is the use of a finer measurement of symptoms, such as symptom-rating scales. Also, even overall reductions in core symptoms do not mean that individuals necessarily return to normal development. This makes it important to keep in mind that early and later symptoms could have different roles in development.

Comorbidity

Psychiatric disorders seldom stand alone, in fact, more often than not there is comorbidity (Angold, Costello, & Erkanli, 1999; Caron & Rutter, 1991; Youngstrom, Findling, & Calabrese, 2003). In clinical samples of children with ADHD it has been reported that only between 25-30% show symptoms of ADHD in the absence of any other disorders (Jensen et al., 2001; Takeda, Ambrosini, deBerardinis & Elia, 2012). ADHD has consistently been found to have especially high comorbidity with the disruptive behavior disorders Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) (e.g. Pliszka, 1997).

ODD is characterized by a pattern of defiant, hostile, negativistic and disobedient behavior towards authority figures with the core features of interpersonal sensitivity and high emotional reactivity (Loeber, Burke, Lahey, Winters, & Zera, 2000). CD is considered a more severe disorder, defined by a pattern of aggression, destruction, lying, stealing and truancy (American Psychiatric Association, 2000). ODD is typically diagnosed between the ages of six and 10, due to this being approximately when there is a pronounced decline in normative oppositional behavior in the general population. Most children with ODD do not go on to develop CD, but they are at a greater risk for conduct problems (Loeber et al., 2000). Childhood onset CD requires a diagnosis before age 10, and some present with milder conduct problems as early as preschool (American Psychiatric Association, 2000). It is this early-onset type of CD that is more likely to be associated with ADHD (Loeber et al., 2000). A meta-analysis of 21 community samples reported a median odds ratio of 10.7 between ADHD and ODD/CD (Angold et al., 1999). In normal populations the comorbidity of ADHD and disruptive behavior disorders is about 30% and in clinical populations as high as 80-90% (Kadesjö & Gillberg, 2001; Pliszka, 2000).

These high comorbidity rates lead to the question of specificity. As studies still do not always differentiate individuals with ADHD in relation to the presence or absence of other symptoms, the inference is that the child shows symptoms of ADHD specifically, which is not likely the case. In order to more fully understand the ADHD psychological profile there is a need for investigations to characterize participants in relation to probable comorbidities.

Cognitive Deficits

Deficient cognitive functioning is recognized as one of the components of the complex neuropsychology of ADHD. Barkley's (1997a) influential model of ADHD argues that the central feature of ADHD is poor inhibitory control. This primary inhibition deficit in turn affects other executive components, the so-called "executive functions" (a collection of higher-order cognitive functions, such as working memory, regulation of emotion, motivation and arousal). Studies have indeed found relations between poorer executive functions and ADHD symptoms in both clinical and community samples (for reviews see Martinussen, Hayden, Hogg-Johnson, & Tannock, 2005; Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005). However, only a smaller proportion of children with ADHD have been found to have multiple executive-function deficits and fewer than half exhibit significant impairment on any specific executive function task (Nigg, Willcutt, Doyle, & Sonuga-Barke, 2005; Willcutt et al., 2005).

This large gap in overlap between disorder and proposed cause opens up for alternative causal models. The dual pathway model proposed by Sonuga-Barke (2002, 2003, 2005) instead postulates that ADHD is associated with executive function deficits (more related to response inhibition) and motivation deficits (more related to delay aversion – the propensity to choose an immediate reward over a larger delayed reward), with both of these types of deficits contributing independently to ADHD. Support for this view has also been found in clinical and community samples (Castellanos, Sonuga-Barke, Milham, & Tannock, 2006; Sonuga-Barke, Sergeant, Nigg, & Willcutt, 2008, for reviews). Distinct groups of children affected by either executive function problems or delay aversion have been identified; however, again, evidence indicates that each set of deficits affects only a minority of cases (Sonuga-Barke & Halperin, 2010).

The "state regulation" hypothesis (Sergeant, 2000; 2005; van der Meere, 2005) also agrees that ADHD is associated with executive function deficits, but proposes that these deficits are underpinned by poor state regulation (e.g. problems with regulation of effort, arousal and activation). These regulatory problems are then thought to give rise to slower and more variable reaction times. This causal explanation integrates cognitive and motivational explanations by providing a conceptual framework that shifts focus from a specific deficit to regulatory processes that may influence all of the cognitive constructs mentioned above (Douglas, 1999).

Studies on cognitive functioning and ADHD have consistently shown a more variable response speed on reaction tasks in clinical and non-clinical studies (e.g. Berwid et al., 2005; Johnson et al., 2007; Klein, Wendling, Huettner, Ruder, & Peper, 2006; Kuntsi, Andreou, Ma, Börger, & van der Meere, 2005; Lijffijt, Kenemans, Verbaten, & van Engeland, 2005). Yet again, not all children with ADHD present reaction-time variability. In a

direct comparison between medication-naive boys (six to 12 years old), with an ADHD diagnosis with age-matched, symptom free controls, Coghill et al. (2013) assessed a broad range of cognitive functioning (e.g. working memory, delay aversion, inhibition and response variability) and found that the ADHD group performed less well across all of the cognitive functioning domains. However, only a minority of those with ADHD had a deficit, quotas across the board ranging from 36% for delay aversion and 18% for response variability.

Settling which theoretical model best describes the causal mechanisms of ADHD is beyond the scope of the empirical studies included in this thesis. The topic of cognitive function is chiefly of interest here inasmuch as some of the research questions presented are informed by the findings linking ADHD to poorer cognitive performance, and the results pointing to the heterogeneous nature of these cognitive deficits. It could be that cognitive performance has an additive and/or interactive influence on other types of objective performance, and/or plays a part in relations between ADHD and subject perspective, making them important objective performance measures in the ADHD context.

Other Etiological Factors –The Attachment Perspective

Because the cognitive-deficit models cannot entirely explain the expression of ADHD symptoms, environmental risk factors could very well be relevant. Possible etiological factors tied to the family context have been explored. More severe family adversity such as marital conflict, parental psychopathology and stressful life events have been related to ADHD over and above co-occurring ODD and CD (Biederman, Faraone, & Monuteaux, 2002; Counts, Nigg, Stawicki, Rappley, & Von Eye, 2005). These factors are however generally considered bidirectional associations.

As ADHD symptoms manifest quite early, the potential contribution of early caregiving has been considered. Extreme forms of early deprivation have been suggested to have a causal link to inattention/overactivity symptoms (as well as to quasi-autistic symptoms), by the results of a study using an adoption study design (Stevens et al., 2008). Although the quasi-experimental design of this study does not prove causality, it certainly indicates that the role of early caregiving should not be dismissed.

Other investigations of the background to ADHD along this relational, parent-child perspective have been made using attachment theory. According to attachment theory, which is based on the joint work of John Bowlby and Mary Ainsworth (Ainsworth & Bowlby, 1991), early experiences with caregivers are the foundation for the child's socio-emotional development (Cassidy & Shaver, 2008). Early interactions with caregivers give rise to internal working models that shape the child's interpretations of self and interactions with others, and help regulate behavior (e.g. Bretherton & Munholland, 2008). Generally speaking, when caregivers are responsive and

sensitive, a secure attachment relationship is likely to develop. When caregivers are less sensitive, an insecure attachment relationship is more likely to develop.

Central to attachment research is the distinction between attachment behaviors and attachment representations. In infancy attachment behaviors involve protesting a caregiver's departure, clinging when scared, following when able and greeting the caregiver upon return; behaviors all designed to maintain proximity to the caregiver. Individual differences in infant attachment are studied using a semi-structured lab procedure called the Strange Situation Procedure (Ainsworth, Blehar, Waters, & Wall, 1978). This procedure involves observing attachment behaviors and was designed to capture the child's exploration/close proximity-balance during repeated separations and reunions with the caregiver in conditions of increasing stress. According to the classification guidelines, secure children use the parent as a secure base when exploring the environment and a "safe haven" when stressed. Upon separation secure children show distress and greet the caregiver upon their reunion. Insecure-avoidant children explore readily, do not show distress upon separation and respond minimally upon reunion. Insecure-ambivalent children show distress from the beginning, cling to the caregiver and do not explore. An insecure-ambivalent child would show distress during separation but fail to be comforted upon reunion. Later attachment research has identified children that display contradictory responses and seemingly bizarre behaviors in stressful situations, such as freezing and chaotic movements (Main & Solomon, 1990). Children that show attachment behaviors that lack a coherent, organized strategy to handle stress and anxiety are "disorganized"; an attachment strategy that is thought to develop when caregivers are experienced as frightening or frightened. The contradictory and freezing behaviors are considered to reflect the inner conflict of wanting to both approach and distance oneself from the caregiver.

As the child grows, however, attachment behaviors lose some of the proximity-seeking characteristics typical of the toddler period and take on more age-related tendencies. With cognitive development and social experience, the establishment of the internal working model thought to reflect the attachment relationship is advanced – towards middle childhood, the internal representation of how available caregivers are is what reflects the attachment relationship (Kerns & Richardson, 2005). What becomes of interest later in childhood is instead capturing attachment at the level of symbolic interactions, i.e. the "attachment representation" produced by the internal working model (Bretherton & Munholland, 2008). Attachment representations reflect the/a lens through which the individual interprets their world, and as such, they give unique insight into the subject's perspective.

Individual differences in attachment representations are commonly captured using story-stem methodology (see for example Bretherton & Oppenheim, 2003; Goldwyn, Stanley, Smith, & Green, 2000). A story stem

is a fixed beginning, i.e. a set up, of a story. Story-stem methodology when used in attachment research involves presenting children with story stems describing distressing events meant to elicit secure-base seeking impulses (i.e. scenarios involving discomfort, threat or separation from caregivers). The verbal narrative the child then produces in response to the story stem is thought to reflect the attachment relationship and the narratives are coded according to various coding practices that are guided by attachment theory (e.g. George & Solomon, 2000). Generally speaking, children are coded as “secure” if they coherently acknowledge the problem at hand in the story and let it be known that the problem will be solved by a prompt and adequate response by caregivers. Narratives are coded as “insecure-avoidant” if the child conveys that there is no need for the parent to provide care or protection, which is thought to represent a deactivation of the attachment system. Narratives are coded as insecure-ambivalent when the child conveys that there is an attachment problem; however, attention is directed away from the source of distress, a classification characterized by cognitive disconnection. The narratives of children coded as “disorganized” lack a solution to the attachment problem and are instead characterized by incoherence, chaos and violent or threatening themes. The validity of story-stem methodology for capturing representations of the attachment relationship has been demonstrated through associations with Strange Situation security classifications and through concurrent security assessments of observed separations and reunions (Bretherton, Ridgeway, & Cassidy, 1990).

Insecure attachment in general, assessed at both the behavioral and representational level, is related to behavioral outcomes such as low sociability, anger, problematic peer relations, and problems with self-control and emotion regulation (Greenberg, Speltz, & DeKlyen, 1993; Moss, Cyr, & Dubois-Comtois, 2004; Sroufe, Carlson, Levy, & Egeland, 1999). Although related to negative outcomes, children within the insecure-avoidant and insecure-ambivalent attachment categories still have an organized way to handle stress and anxiety. Children with disorganized attachment, on the other hand, lack strategies to handle stress and anxiety and it is this subgroup of insecure attachment that is most often linked to psychopathology (Fearon, Bakermans-Kranenburg, Van IJzendoorn, Lapsley, & Roisman, 2010; van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999).

It has been pointed out that children with ADHD and children categorized as insecure share many of the same characteristics, such as impulsiveness, poor self-regulation and problematic social relations (Clarke, Ungerer, Chahoud, Johnson, & Stiefel, 2002). And in the limited literature on the attachment background to ADHD, empirical support has been found for a link to disorganized attachment. Infant disorganized attachment has been related to inattention and hyperactivity seven years later in community samples (Pinto, Turton, Hughes, White, & Gillberg, 2006) and attention problems have been linked to concurrent disorganized attachment representations

in older children, independent of aggression or rule-breaking behaviors (Goldwyn et al., 2000). The relationship between ADHD and attachment in conjunction with cognitive performance measures and comorbid disruptive behaviors has also been investigated. Two longitudinal studies have linked disorganized attachment to ADHD symptoms; however, the results regarding the role of cognitive performance and comorbid problem behaviors are somewhat divergent. Thorell et al. (2012) found that disorganized attachment representations assessed in a non-clinical sample, when children were eight years old, were associated with ADHD symptoms one year later, independent of executive functioning deficits (measures of response inhibition and working memory) and conduct problems. Using similar methodology, Bohlin et al. (2012) found that disorganized attachment representations when children were five years old, predicted ADHD symptoms two years later, but here results indicated that disorganized attachment co-varied with poor inhibition and conduct problems.

Although the scope of this thesis does not include investigating attachment disorganization as a causal factor in the development of ADHD, the later research questions presented here are informed by the above-mentioned findings pointing to the value of investigating both cognitive deficits and attachment representations simultaneously. Furthermore, a related matter is that the story-stem methodology typically involved in assessing childhood attachment representations could be problematic. Attachment-representation coding relies on both narrative structure and narrative content (Oppenheim & Waters, 1995), an issue that must be considered when studying children with ADHD symptoms. This pressing methodological issue is explained in more detail below, under the heading “The Link to Disorganized Attachment Representations”.

Areas of Interest: Answering Questions and Questioning Answers

With the selective overview of some of what we know about ADHD as a general background to our view of ADHD, this thesis sets out to merge the investigation of behavioral symptoms with the investigation of objective performance and subject perspective. There are several areas of interest for which such a merger could help address important unanswered questions with regard to ADHD symptomology. In addition to wanting to answer unanswered questions, these areas of interest also reflect the aspiration to further question some of the findings of previous, related research.

ADHD is related to underperformance within the academic realm and within the social realm. By introducing novel subject perspective measures

to these two very central underperformance features of higher levels of ADHD symptoms, a better, more nuanced, understanding can be gained.

Additionally, as described above, the child-caregiver attachment relationship has been suggested as an etiological factor involved in the expression of ADHD symptoms. According to attachment theory, an infant's experiences with primary caregivers give rise to mental representations that are consolidated in childhood as internal working models – a cognitive framework comprised of mental representations for understanding the world, self and others (Bretherton & Munholland, 1999). Moreover, internal working models shape the child's interpretations of self and interactions with others, and help regulate behavior (e.g. Bretherton & Munholland, 2008). From my perspective, these internal representations can be seen as a/the lens through which the individual perceives and evaluates their reality. I would argue that what attachment theory is providing here is a unique and “close-up” subject-perspective measure. The opportunity is given to more fully investigate the potential relationship between attachment representations and ADHD symptoms by simultaneously investigating objective performance measures. What follows is a more in depth presentation of the background to my areas of interest, leading up to the aim and main research questions of this thesis.

Academic Underperformance

It is when children enter primary school and are expected to perform in a certain manner, master specific tasks, and are held to external educational standards, that initial investigations of the presence of ADHD are often made (Loe & Feldman, 2007). The classroom setting allows for performance comparisons between peers, thus making the behavioral characteristics of ADHD, such as distractibility, restlessness and limited attention span, more salient. It has been well established that symptoms of ADHD are related to poorer performance on a host of academic achievement measures. Poorer performance on national tests, lower grades, lower graduation rates and lower post-secondary education attainment are related to higher levels of ADHD symptoms in clinical and community samples (Frazier, Youngstrom, Glutting, & Watkins, 2007; Loe & Feldman, 2007; Polderman, Boomsma, Bartels, Verhulst, & Huizink, 2010).

Clearly ADHD symptoms are associated with adverse academic outcomes, although there is no consensus on the cause of this negative relationship (van der Kolk, van Agthoven, Buitelaar, & Hakkaart-van Roijen, 2015) nor known investigations into the paths this negative influence could take over time during the course of academic careers. Higher academic achievement is an important predictor of SES, wellbeing and health later in life (Huisman, Kunst, & Mackenbach, 2005). Academic performance is thus a key point of concern when interested in contributing to a greater understanding of how we can better the lives of those with ADHD.

One factor often considered to be of central importance for encouraging academic performance is self-perception of competence. Schools spend substantial proportions of their budgets on programs meant to boost children's beliefs in their competence, hoping that this will result in higher grades and national test scores (Ellis, 2014). Children's self-perceptions of academic competence have been found to have mutually enhancing links to better academic performance (Marsh & O'Mara, 2008); however, it is not known whether self-perceptions of academic competence matter in the presence of ADHD symptoms.

Another type of subject perspective that is important when it comes to academic performance is how an individual views their future. Having a positive outlook on future education and employment has been related to better academic performance (Nurmi, Seginer, & Poole, 1990; Seginer, 2009). Upon leaving secondary school, how adolescents think and feel about their future becomes important; academic aspirations have been related to attainments independently of childhood IQ, parental education level, and academic performance (Beal & Crockett, 2010; Dubow, Boxer, & Huesmann, 2009; McLeod & Fettes, 2007). Even though ADHD symptoms are related to adverse adult outcomes (Barkley, Fischer, Smallish, & Fletcher, 2006; Kuriyan et al., 2013), it is not known whether ADHD symptoms in late adolescence predict negative views of the future, or whether potential relations to future-outlook are influenced by poorer academic performance.

Answering the question of how the academic underperformance of school-aged children with high levels of ADHD symptoms is related to subject perspective could indicate where efforts to improve performance are best made. Early and later ADHD symptoms could have different kinds of influence on academic performance. Research has completely overlooked the future-oriented sentiments of those with ADHD symptoms. Future outlook influences our actions and directs the immediate decisions we make (Nuttin & Lens, 1985; Trempala & Malmberg, 2002). Investigating the telescope through which an individual views their future could tell us where future investments lie and give insight into subjective wellbeing.

Positive Illusions of Social Underperformance

How well one carries out the task of being socially accepted, or "performs" in the social realm, is of great importance. Peers are a big part of children's lives and poor social acceptance is often associated with unhappiness and poor school adjustment (Gifford-Smith & Brownell, 2003). A prominent feature of ADHD is impairment in peer relations. Children with high levels of ADHD symptoms, in clinical and community samples, are evaluated by others, such as teachers, parents and classmates, as being less accepted by peers (Bagwell, Molina, Pelham, & Hoza, 2001; Diamantopoulou, Henricsson, & Rydell, 2005; Diamantopoulou, Rydell, Thorell, & Bohlin,

2007; Hoza et al., 2005). Investigations have shown that when children with an ADHD diagnosis are rejected by peers, it increases the risk for depression, anxiety, delinquency, academic failure and substance abuse (Greene, Biederman, Faraone, Sienna, & Garcia-Jetton, 1997; Mikami & Hinshaw, 2006).

To understand children's social functioning, one must not only understand how they perform in the social realm, information is also needed on their subjective evaluations of that performance. The discomfort or comfort experienced in peer relationships is influenced by children's self-perceptions of their social acceptance (for review see Ladd, 1999). And, as Hymel and Franke (1985) point out "...how children themselves perceive and interpret their social difficulties may influence subsequent behavior, and in turn, the likelihood of negative interpersonal outcomes" (p. 76).

Having a positive view of social acceptance could be a protective factor, but it could also lead to inappropriately overstepping social boundaries. When it comes to ADHD symptoms and self-perceptions of social acceptance, there is research indicating that children with an ADHD diagnosis tend to evaluate their social acceptance level as higher than that reported by others (e.g. Hoza et al., 2004; Hoza, Pelham, Dobbs, Owens, & Pillow, 2002; Hoza, Pelham, Milich, Pillow, & McBride, 1993; Hoza, Waschbusch, Pelham, Molina, & Milich, 2000). This interesting subject-perspective bias is known in a growing literature as the Positive Illusory Bias (PIB), and has been theorized as playing a part in why children with ADHD are rejected by their peers (for review see Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007). The PIB has also been suggested as playing a role in increased aggression in children with an ADHD diagnosis (Hoza, Murray-Close, Arnold, Hinshaw, & Hechtman, 2010).

Previous research has however not investigated the PIB in relation to ADHD along the full range of symptom severity, or whilst considering likely comorbidities and cognitive functioning. Overestimations could very well be explained by other disorders and/or problems with cognitive functioning. Information regarding if and how the PIB is "specifically" related to ADHD symptoms has the potential of pointing us in the direction of mechanisms involved in the peer problems of those with ADHD symptoms.

The Link to Disorganized Attachment Representations

ADHD has been suggested to have an attachment background, but only very few have studied the relationship between ADHD and attachment in conjunction with cognitive performance measures and comorbid problem behaviors. Thorell et al. (2012) found that disorganized attachment representations predicted ADHD symptoms, independent of response inhibition, working memory, and conduct problems. Bohlin et al. (2012) also found that disorganized attachment representations predicted ADHD symptoms, but not

independently of poor inhibition and conduct problems. These divergent results indicate that the role of cognitive performance and comorbid behaviors, in the link to attachment representations, needs further investigation. As mentioned earlier, there are also methodological issues involved in assessing attachment representations in the presence of ADHD symptoms that need to be addressed. The basic premise of the attachment story-stem methodology is that story stems with attachment content elicit “secure-base seeking” impulses. However, there is in fact very little research supporting the theory that responses to story-stems with attachment content differ from concurrent responses to non-attachment related story stems (i.e. stems that do not involve the care or protection of the caregiver). In the one known study investigating this, Greenberg et al. (1997) found that insecure children showed higher levels of aggression and lower levels of engagement with the interviewer in responses to attachment content, but not in their responses to non-attachment content. However these results were in no way conclusive as the non-attachment related content used was quite sparse in comparison to the attachment content, which could explain the differential responses. Importantly, the Greenberg et al. (1997) study did not at all consider ADHD symptoms.

Because the coding of attachment representations relies on both content and structure, this type of attachment assessment is very dependent on storytelling ability and perhaps even the individual’s more general “frame of mind”. When responding to a story stem the individual self-generates the narrative structure and content of their response, which when using attachment content is thought to reflect the attachment relationship. But since it is questionable whether attachment content elicits specific responses, responses could also reflect cognitive abilities or perhaps something like established attitudes or emotional states. It could very well be that the differences in narrative structure and content found in responses to attachment content sometimes reflect a more general narrative style or more general “frame of mind”, and not the attachment relationship per se.

In fact, there is research showing that ADHD symptoms relate to being less coherent when telling a story, even when the stories do not have attachment themes (Flory et al., 2006; Lorch, Milich, Flake, Ohlendorf, & Little, 2010; Renz et al., 2003; Tannock, Purvis, & Schachar, 1993). This incoherent narrative performance could be related to deficient cognitive functioning and/or the ADHD behaviors themselves. Higher levels of more generally assessed attention- and externalizing problems have also been related to violent and negative story-themes (Von Klitzing, Kelsay, Emde, Robinson, & Schmitz, 2000; Warren, Oppenheim, & Emde, 1996; Zahn-Waxler, Cole, Richardson, & Friedman, 1994). These features of narrative production – incoherence and propensity to include negative and violent themes – could reflect a narrative style or more general “frame of mind” and be what makes

children with ADHD symptoms appear to have disorganized attachment representations.

With this in mind, using concurrent responses to attachment story-stem content and responses to non-attachment content is imperative when investigating ADHD and attachment representations. To test the attachment perspective on ADHD more thoroughly, studies must also include cognitive functioning, and comorbid conduct problems. The results of testing the attachment perspective on ADHD in this more extensive fashion could potentially be very telling with regard to the validity of using story-stem methodology when assessing attachment representations.

Aim

In sum, ADHD symptoms are related to poorer academic performance, poorer performance on the cognitive level, poorer performance within the social realm, and in narration tasks. Additionally, the subject's perspective can be associated with their ADHD symptoms in different ways, using different conceptualizations of subject perspective, such as self-perceptions of competence and attachment representations. Information on how objective performance relates to subject perspective could lead efforts to ameliorate the negative consequences of poor performance and even improve performance itself. Therefore, the aim here is to expand knowledge on ADHD symptoms by *simultaneously* investigating objective performance and subject perspective in relation to ADHD symptoms.

Main Research Questions

Given the overall aim of expanding knowledge on ADHD by simultaneously investigating objective performance and subject perspective in relation to ADHD symptoms, the following overarching question arises:

- What do ADHD symptoms, objective performance and subject perspective tell us when studied together?

The three empirical studies included in this thesis address this overarching question from different angles, each posing their own more specific research question, sprung from each of the areas of interest presented above.

- Study I – Is academic performance influenced by subject perspective when also considering the influence of ADHD symptoms?

- Study II – Do positive illusions of social underperformance relate to ADHD symptoms specifically?
- Study III – Is there really a link between disorganized attachment representations and ADHD?

Methods

Participants

The three studies included in this thesis used separate samples of school-aged children recruited in Sweden. All of the samples were selected to represent a wide variation in ADHD-symptom severity, reflecting a dimensional approach to ADHD. Parental consent was a requirement for participation for those under 18 years old. All three studies were approved by the local ethics committee.

Study I was a population-based sample (N=192, 47% female), comprised of three data-collection waves. These took place when children were in sixth grade ($M=12$ years and 10 months old, $SD=4.8$ months), 11th grade and 12th grade. The recruitment base for Study I was 323 children (49% girls) who had previously been recruited in the first grade to participate in a larger population-based project about long-term adjustment and they represented a randomized, stratified classroom selection, made to assure the inclusion of all residential areas in a university town. In grade six, the classmates of these 323 children were recruited into the project (see Nyberg, Henricsson, & Rydell, 2008). This provided 776 sixth graders for which teacher ratings of ADHD and academic achievement were available.

Because the clinical criteria of ADHD applied to under 10% of the classmate sample, those included in the second data wave collection of Study I (five years later) were those who in sixth grade had one or more symptoms of ADHD that “occurred often” or four or more symptoms “occurring sometimes”, and a roughly equal number of children below the study’s ADHD-symptom criteria, balanced for sex with “ADHD-symptom” participants (N=454).

The 269 11th graders (59.2% of our custom ADHD sample of 454), who had reported that they were willing to participate again, were contacted one year later when they were in 12th grade. After three reminders, 26 participants could not be reached and 50 did not wish to respond. A total of 193 adolescents (47% female) took part in the final data wave (71.8% of those in the second data wave). Data for one participant were incomplete and this participant was excluded from the analyses.

Study II and Study III specifically sought to include participants expected to have clinical levels of ADHD symptoms (children recruited either from an ADHD center, child psychiatric clinic or special education unit). In both

studies, these expected high ADHD symptom level-participants were then age and sex matched with participants recruited from local schools. Distribution plots indicated that for both studies the two different recruitment groups overlapped, i.e. did not result in a bimodal distribution of ADHD symptoms.

The participants included in Study II were between 7 and 13 years old ($M=10$, $SD=1.5$ years, $N=86$). 22 children (50% girls) were recruited through the local child psychiatric clinic and from a special education unit. These children either had an ADHD diagnosis or were currently being evaluated by specialists. Two of these children had a diagnosis of Asperger Syndrome and were excluded. 66 children (57% girls), not diagnosed or currently under ADHD evaluation, were recruited through local schools.

The participants included in Study III were between 6 and 10 years old ($M=8.27$, $SD=0.96$ years, $N=89$). We recruited 27 children with an ADHD diagnosis (26% girls) through an ADHD center and 62 children (27% girls) through local schools that were matched to correspond to the sex and age ratio of those recruited through the ADHD center. None of the children in Study III had comorbid neuropsychological diagnoses.

Procedures

Study I collected reports from teachers, parents and adolescents via questionnaires. All questionnaire respondents received a movie ticket worth 16 Euros for each completed questionnaire. In sixth grade teachers reported on child ADHD symptoms and academic performance within the core subjects of Swedish, English and Math. In 11th grade, questionnaires were mailed to adolescents, including questions about academic self-perception and formal grades in Swedish, English and Math. At the same time, their parents received a separate questionnaire including ADHD-symptom ratings and questions regarding their children's grades in the above-mentioned core subjects. In 12th grade, questionnaires were sent out to adolescents only, covering current grades, the job titles of their parents and their views on their own future.

The procedures of Study II and Study III involved individual sessions carried out by research assistants, in private rooms at the children's schools. Questionnaires collecting teacher reports were distributed to teachers during the school visit and questionnaires collecting parent reports were mailed to parents. Before the test session with the child, research assistants always informed the child that participation was voluntary and that he or she could discontinue their participation at any time. All tasks that the children were given had standardized verbal instructions and were presented in a fixed order. In both studies a toy worth 3-5 euros was given to the children after the test session. As an appreciation of participation teachers received a mov-

ie ticket for responding to the questionnaire. Parents received a written expression of gratitude.

In Study II, the test-sessions with children consisted of two blocks, with a short recess in between. The first block consisted of cognitive performance tasks and the second block consisted of questions regarding self-perception of social acceptance. Parents and teachers reported on ADHD symptoms, ODD symptoms and rated the social acceptance of the child.

In Study III, the child test session began with the set of cognitive performance tasks, followed by the vocabulary task, and concluded with the story-stem task (with both attachment and non-attachment related content). Parents and teachers reported on ADHD symptoms and conduct problems.

Measures

All of the studies included in this thesis used measures of behavioral symptoms, objective performance and subject perspective. Performance on objective performance tasks was considered in terms of how successfully they were carried out as judged by an outside source. The measures that tapped into the subject's perspective varied in focus and in how comprehensively the task encompassed the subject's perspective. What follows is a detailed description of all measures.

Behavioral Symptoms

ADHD

ADHD symptoms were measured using the ADHD Rating Scale-IV, an 18-item measure reflecting DSM-IV criteria, which is well validated and widely used within ADHD research (DuPaul et al., 1998). Nine items measure behaviors labeled as "inattention" and nine items measure behaviors labeled as "hyperactivity/impulsivity". A three-step response format was used in Study I for the sixth grade measure of ADHD symptoms in order to harmonize with other study questions (0 "never", 1 "sometimes present" and 2 "often present"). In the latter part of Study I and in the remaining studies, the four-step response format provided by DSM-IV was used: 0 (*never or rarely*), 1 (*somewhat*), 2 (*often*) and 3 (*always or very often*). Study I used teacher ratings in sixth grade and parent ratings in 11th grade. Scales were created using the mean across items. Internal consistency for the teacher ratings were $\alpha=.89$ for inattention symptoms and $\alpha=.90$ for hyperactivity/impulsivity symptoms. Internal consistency for the parent ratings were $\alpha=.93$ for inattention symptoms and $\alpha=.87$ for hyperactivity/impulsivity symptoms.

Study II and Study III used an aggregated ADHD measure, i.e. the mean of concurrent teacher and parent ratings. In Study II, internal consistency of

the scale for parents was $\alpha=.91$ and $\alpha=.96$ for teachers. The correlation between raters was $r=.79$ for inattention and $r=.61$ for hyperactivity/impulsivity, both $p<.01$. In Study III the internal consistency of ADHD ratings was $\alpha=.97$ for parents, and $\alpha=.94$ for teachers. The parent and teacher ratings correlated $r=.65$, $p<.001$. Finally, the ADHD scales in both Study II and III had values of kurtosis <1.10 and values of skewness <1.35 , indicating adequate normality (Kline, 1998).

ODD

ODD symptoms were measured in Study II using an aggregate of parent and teacher ratings of the eight DSM-IV ODD behaviors (American Psychiatric Association, 2000; Bussing et al., 2008). The response format was 0 (*never or rarely*), 1 (*somewhat*), 2 (*often*) and 3 (*always or very often*). Internal consistency was $\alpha=.93$ for both parents and teachers and the ratings correlated $r=.55$, $p<.01$. The ODD scale had values of kurtosis <1.10 and values of skewness <1.35 , indicating adequate normality (Kline, 1998).

Conduct Problems

Conduct problems were measured in Study III using five items from the externalizing scale of the Children's Behavior Questionnaire (Rutter, Tizard, & Whitmore, 1970). The following items were used: "Often disobedient", "Often fights with other children", "Angers easily", "Has stolen things/money", and "Sometimes lies". The rating scale ranged from 0 (*does not apply*) to 4 (*applies very well*). Internal consistency was $\alpha=.76$ for parent ratings and $\alpha=.83$ for teacher ratings. Parent and teacher ratings were correlated, $r=.59$, $p<.001$. The mean of parent and teacher ratings was used as the measure. This conduct problems measure had values of kurtosis <1.10 and values of skewness <1.35 , indicating adequate normality (Kline, 1998).

Objective Performance Measures

Academic Performance

Study I used the mean of teacher estimates of children's performance, rated on a five-point-scale, in the three core subjects of Swedish, English and Math, as the sixth grade measure of academic performance ($\alpha=.90$). This measure was used because in Sweden, at the time, formal grades were not given until students reach the eighth grade). This sixth grade measure correlated highly with results on national tests in a subsample ($N=87$, $r_s >.82$, $p<.001$, Henricsson & Rydell, 2006). The 11th and 12th grade measures of academic performance in Study I calculated a grade-point-average using reports of formal grades in the same core subjects mentioned above. In 11th grade, a grade-point average was calculated using parent reports of formal grades and in 12th grade using self-reported formal grades ($\alpha=.83$ $\alpha=.77$ re-

spectively, the correlation between parent and adolescent reports of formal grades in the 11th grade was $r=.96, p<.001$).

Other-Estimated Social Acceptance

In Study II social acceptance was measured through teacher and parent estimations (Cole, Gondoli, & Peeke, 1998). We used the two-item teacher scale that corresponds to the Harter Self-Perception Profile for Adolescents (Harter, 1988), e.g. “this individual does have a lot of friends”, “this individual is able to make close friends”. We used a five-step response format ranging from 1 “Does not apply at all” to 5 “Applies very well” ($\alpha =.82$ for teachers, $\alpha =.77$ for parents). Agreement between parents and teachers was $r=.49, p<.01$.

Cognitive Performance

Study II and Study III evaluated various aspects of cognitive functioning using standardized performance tasks. More detailed information about the stimuli and procedure of the tasks can be found in the enclosed papers.

Working memory

In Study II working memory was measured as children’s performance on the Counting Span Task (Towse, Hitch, & Hutton, 1998). This task involves counting shapes displayed in an array on the computer, and then recalling the total number of shapes for each array in that sequence. The number of arrays displayed increased with one array for each level, with seven arrays at the highest level. This measure was reversed so that high values signify poorer working-memory performance.

In Study III working memory was measured as children’s performance on the Children’s Size-Ordering Task (McInerney, Hrabok, & Kerns, 2005). This task involves verbally repeating back common nouns according to size. The measure was the total number of pairs of items ordered correctly across trials, added together, and then reversed, as to reflect working memory “deficits”.

Inhibition

In Study II response inhibition was assessed using the Continuous Performance Test (CPT; Losier, McGrath, & Klein, 1996). This widely used paradigm involves recording button-press responses to targets and non-targets. The mean of the standardized commission error rate, i.e. when a response was recorded to a non-target, and the multi-response rate, i.e. when the response button was pressed multiple times in response to a target, were combined into the inhibition measure, $\alpha=.74$.

In Study III we measured response inhibition with a Stroop-like, Opposite-Pairs task that did not require reading skills (Berlin & Bohlin, 2002). This task is a development of the Day-Night Stroop task (Gerstadt, Hong, &

Diamond, 1994) where children are asked to say the opposite of a picture presented on a screen. The sum of the number of incorrect responses and response corrections was used as the inhibition measure, i.e. a higher number indicates poorer inhibition.

Reaction-time variability

In Study II we used the standard deviation of the response time during the child's performance on the CPT as the measure of reaction-time variability.

Sustained attention

Study III employed a computerized go/no go-task developed by Berlin and Bohlin (2002) to measure sustained attention. The total number of omission errors (not responding to a pre-potent target stimulus) and the standard deviation of the reaction times were standardized and averaged to form the measure.

Vocabulary Performance

Study III used the vocabulary subtest of Wechsler Intelligence Scale for Children – 4th Edition (WISC-IV; Weschler, 2003) to measure word knowledge and verbal concept formation. The raw scores, scored according to the WISC-IV handbook were used as the measure.

Narrative Coherence

In Study III the children were presented with a total of six story-stems in a fixed order. The first, second to last and the last story-stem were all non-attachment related, i.e. did not require the parent for comfort or protection. The transcriptions of the replies to these non-attachment related story-stems were rated with regard to ability to tell a coherent story by coders blind to all other participant scores.

The coherence ratings were based on the Narrative Coherence Scale used by Sher-Censor and Oppenheim (2004) and used 5 levels, ascending numbers reflecting incoherence. Central to this narrative performance scale are shifts in the storyline, defined as abrupt and unexplained changes of events. The mean rating across the three story stems was used as the measure, $\alpha=.73$.

Despite the fact that the task involved in this measure required the production of imaginative, self-generated story lines, the narrative coherence measure is categorized here as an objective performance measure because of the focus on the number of storyline shifts. Coherence performance is herein considered to more reflect “higher level” organizational skills and sustained attention abilities, than capture qualitative aspects of the subject's perspective.

Subject Perspective Measures

Self-Perception of Academic Competence

Participants in Study I rated themselves on a scale based on the Harter's Self-Perception Profile for Adolescents (Harter, 1988) in the 11th grade. We used the five-item scale for academic competence with a five-step response format ranging from 1 "Does not apply at all" to 5 "Applies very well". This scale has both positive and negative statements and the mean across items was used as the measure, $\alpha=.73$.

Future Orientation

Study I used three measures to create the "Future Orientation" variable. We selected five age-appropriate items from the Future Orientation Questionnaire (Nurmi et al., 1990) and applied them uniformly to the prospective life domains of education and employment. The first item addressed the value of the domain "How important will this be?": 1= "Not important at all" to 5= "Very important". The second item addressed expectation of success "How will this turn out?": 1= "Very poorly" to 5= "Very well". The final three items assessed emotional valence towards the prospective-life domain "When I think about this I feel" happy/sad, hopeless/hopeful and involved/uninvolved, with a five-step response scale between the opposite emotional valences. The mean of the three emotional valence items for each separate domain was aggregated with the two first items in order for the measure to give equal weight to value, expectance and emotional valence.

Internal consistency for the educational domain was $\alpha =.75$ and for the employment domain $\alpha =.67$. An additional item addressing commitment to higher education ("Will you go on to further education?") was also used as an indicator of the variable "Future Orientation". The response scale assessed the degree of certainty, i.e. 1= "Definitely not", 5= "Yes, definitely".

Self-Estimated Social Acceptance

In Study II children reported on the social scale from the Harter Self-Perception Profile for Adolescents (Harter, 1988). The scale consists of five items with a four-step response format (0= "does not apply at all" to 3= "applies very well"). This adolescent version has been used previously on 9 year-olds (Diamantopoulou, 2007). In our sample the internal consistency was satisfactory among both younger (7-9 year-olds; $n=44$, $\alpha=.76$) and older children (10-12 year-olds, $n=42$, $\alpha =.71$).

Positive Illusory Bias

In Study II the Positive Illusory Bias (PIB) construct was estimated using a discrepancy score between the standardized child and adult scores of social acceptance described above, as recommended in Owens et al. (2007). By

subtracting the adult score from the child score, higher values are obtained indicating larger positive bias. Because overestimation and underestimation could potentially be related to different cognitive factors or behaviors, we gave scores indicating a negative bias a score of 0, thus restricting the range of the discrepancy score to reflect our area of interest, retaining adequate normality (Kline, 1998).

This measure is multifaceted as it uses reports for the subject and outwards sources; however, as it is traditionally defined in terms of the subject's biased relation to the outward sources (i.e. *positive illusory bias*) it is categorized here as reflecting the subject's perspective.

Attachment Representations

In Study III, children were presented with six story-stems in a fixed order. The second, third and fourth story-stems were meant to activate the attachment system. The three stems used (Hurt Knee, Monster in the Bedroom and Separation-Reunion) are ones commonly used to assess attachment representations (i.e. Bretherton & Oppenheim, 2003; Goldwyn et al., 2000).

Transcriptions of the children's narrative response to the story-stems were classified according to the Attachment Doll Play Classification System (George & Solomon, 2000). Each story completion was scored as belonging to one of four attachment categories: secure, ambivalent, avoidant or disorganized. Transcriptions were coded independently by two coders blind to all other participant information. Agreement on classification was Cohen's kappa .69. Disagreements were discussed, and the final classifications of such cases were based on a unanimous decision. For our purposes the ambivalent and avoidant classifications were collapsed into one "organized insecure" group.

Negative Narrative Content

In Study III, the first, second to last and the last story-stems of the story-stem task were all non-attachment related, i.e. did not require the parent for comfort or protection. The transcriptions of the narrative responses to these stems were coded for negative content. Negative content was defined as the occurrence of something unpleasant, harmful or threatening, such as a character getting hurt, crying, or showing aggression/violence.

The negative content measure took into consideration both the number and the severity of negative events. Ratings were given on a scale of 1 "no negative events" to 5 "several very unpleasant events, or one or more very serious events such as death". The mean of the ratings across the three non-attachment related story stems was used as the measure, $\alpha=.64$. Inter-rater reliability for the negative content measure for 26 children from the sample was established at $r=.86, p<.001$.

This measure is categorized as a subject perspective measure because it ultimately taps into a qualitative aspect of the subject's imagination, by way

of self-generated narrative/imaginative responses. In my mind the subjective projective properties of the narration task outweigh the external judgment properties of the measure, which of course can be discussed.

Study I

Background and Aims

Is academic underperformance influenced by subject perspective when also considering the influence of ADHD symptoms? In order to develop productive interventions to facilitate optimal academic progress, there is a need to study a longitudinal framework of concomitant factors. The well-documented poorer academic performance found in those with higher levels of ADHD could be influenced by self-perceptions of academic competence. Furthermore, a key question is whether ADHD symptoms influence future outlook in late adolescence.

A central feature of ADHD is poor academic performance. ADHD symptoms have been linked to poor grades, lower test scores, lower rates of high school graduation and lower rates of post-secondary education (Frazier et al., 2007; Loe & Feldman, 2007). A topic of relevance in a developmental context is to what extent later ADHD symptoms add to an unfavorable academic development set in motion by earlier ADHD symptoms. Positive self-perceptions of academic competence, held by children and adolescents, have been longitudinally associated with better academic performance and higher educational attainment while controlling for initial achievement (Guay, Marsh, & Boivin, 2003; Stringer & Heath, 2008; Zanobini & Usai, 2002). Marsh & O'Mara (2008) found reciprocal links between self-perceptions of academic competence (academic self-concept) and academic performance in a study spanning from late adolescence (10th grade) to five years after secondary school. Whether the positive influence of self-perceptions of academic competence is still present when taking into consideration the potential influence of ADHD symptoms is a question that remains to be answered.

There is some support for an association between ADHD symptoms and negative self-perceptions of academic competence (Horn, Wagner, & Lalongo, 1989; Lalongo, Lopez, Horn, Pascoe, & Greenberg, 1994); however, these findings need to be addressed in a longitudinal design including measures of academic performance. ADHD symptoms could have an indirect effect on academic self-perceptions by way of lower achievement and/or directly influence self-perceptions by, for example, provoking teacher reprimand (Henricsson & Rydell, 2004). It should be of great interest for the educational system to know whether adolescent self-perceptions of academic

competence warrant attention for interventions and supportive measures for adolescents with ADHD symptoms.

Another factor that has been found to be of importance to academic achievement is the individual's view of their future (Nurmi, 1991; Seginer, 2009). Development in late adolescence involves moving towards post-secondary education and/or employment. These two prospective-life domains can be evaluated by the construct of Future Orientation, which has been used in previous research to encompass the individual's forethought (Nurmi, 1990). If or how ADHD symptoms relate to the individual's view of their future, with control for parental educational level, is not known, although broadly assessed externalizing problems in childhood have been associated with lower future educational aspirations in adolescence (McLeod & Fettes, 2007).

Study I aimed to gain an overview of the influence of ADHD symptoms in late childhood and adolescence in relation to academic performance. In doing so we also aimed to address the unanswered questions regarding the respective roles of self-perceptions of academic competence and Future Orientation. Based on previous research, our expectations were that ADHD symptoms would have a negative impact on academic performance concurrently and longitudinally, controlling for the stability of both phenomena, and that self-perception of academic competence was negatively affected by ADHD symptoms concurrently and longitudinally. Further, we expected a positive influence of academic achievement on self-perception of academic competence, both concurrently and longitudinally. We also hypothesized that negative perceptions of one's academic capabilities would have a negative effect on later academic performance and Future Orientation. We also expected that adolescent ADHD symptoms would have a negative influence and academic performance a positive influence on Future Orientation. Considering the expected stability of ADHD symptoms and academic achievement we did not postulate direct paths between the early indicators of these factors and Future Orientation. Finally, we wanted to explore whether Future Orientation had an influence on academic performance in 12th grade. Since adolescents from families with lower socioeconomic status (SES), usually linked to parental educational level, are reported to be less oriented towards further education and employment than adolescents from higher SES (Nurmi, 1991; Seginer, 2009) we controlled for educational level of parental occupation in this last stage of the model. Below are the relations/paths we intended to investigate (see Figure 1).

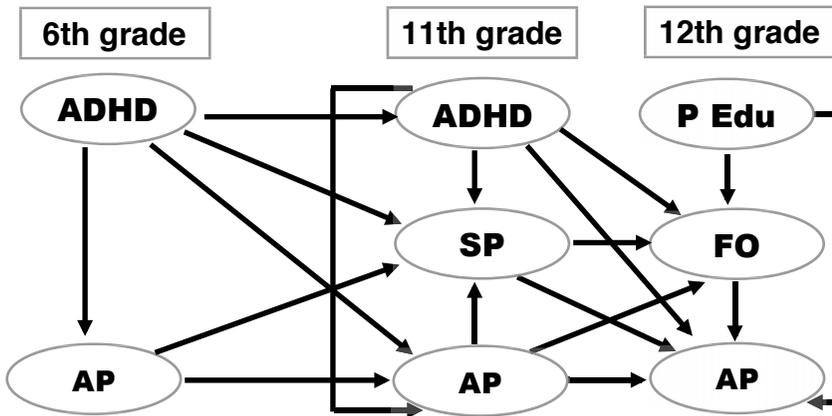


Figure 1. Overview of structural model, ADHD= Symptoms of Attention Deficit Hyperactivity Disorder, AP= Academic performance, SP=Self-perception of academic competence, FO=Future Orientation, P Edu = Parental education

Results

A Structural Equation Model (SEM) was specified in LISREL 8 (Jöreskog & Sörbom, 1996). Before estimating the SEM we tested the validity of the measurement model by specifying a confirmatory factor analysis model with correlated factors. All factor loadings for the observed variables were statistically significant. The SEM model was fitted by the Robust Maximum Likelihood method due to non-normal distribution of the data. The chi-square was 153.24, $df = 73$, $p < .05$ indicating the rejection of the close-fit test of the model. The results of other goodness-of-fit criteria indicate that the model fits the data approximately; our values for Root Mean Square Error of Approximation (RMSEA) = .076, Normal Fit Index (NFI) = .94 and Goodness of Fit Index (GFI) = .90.

The practical guidelines for these fit indices are the following; RMSEA is zero, indicating the model fits the data exactly; a value of RMSEA of about 0.05 or less is indication that the model fits the data closely, a RMSEA value of about 0.08 or less indicates that the model fits the data approximately. For NFI and GFI, zero indicates no fit and one indicates perfect fit. Values of NFI or GFI close to 0.90 reflect a good model fit. The results from our analysis show that the RMSEA = 0.076, NFI = 0.94, GFI = 0.90, and thus the model fit is reasonable. The results of the SEM can be found in Figure 2.

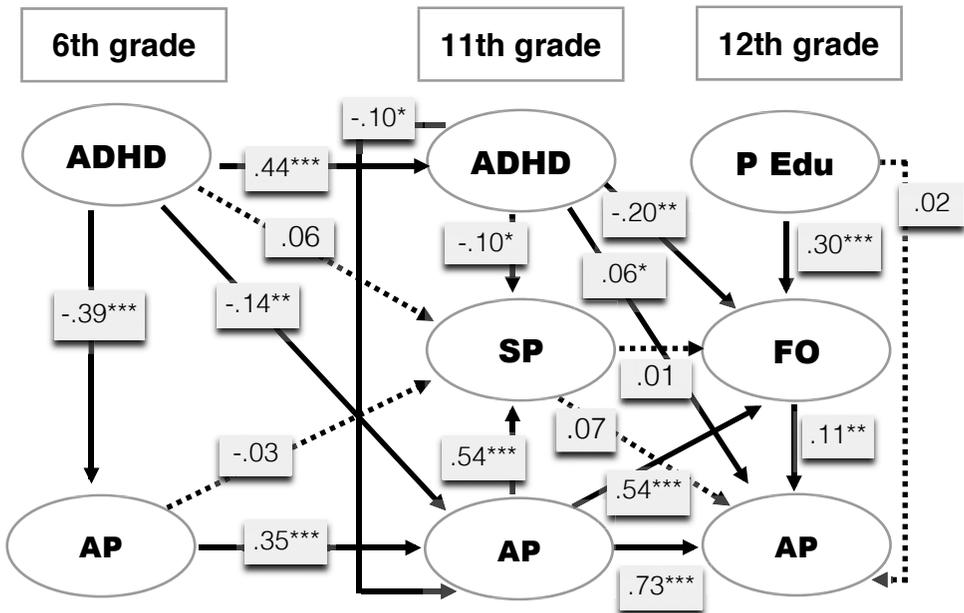


Figure 2. Results of SEM, AP= Academic performance, SP=Self-perception of academic competence, FO=Future Orientation, P Edu = Parental education, dotted line indicates non-significant paths.

As seen in Figure 2, ADHD symptoms and academic performance were stable over time. ADHD symptoms in 6th grade had a negative influence on academic performance concurrently and longitudinally. ADHD symptoms in 11th grade had a negative concurrent influence on academic performance; however, in contrast to our hypothesis, there was a small positive influence on 12th grade academic performance. ADHD symptoms in 11th grade had a negative influence on Future Orientation, whilst academic performance in 11th grade had a positive influence. No significant longitudinal relations were found for self-perception of academic competence, but it was positively related to concurrent, 11th grade measures of academic performance and negatively related to concurrent ADHD symptoms. Future Orientation could be seen to have a positive influence on academic performance (albeit do note that these measures are concurrent).

Conclusions

This study investigated a framework of several factors previously found to be of importance in school careers. By employing the SEM technique using a longitudinal design these factors could be tested together. This study shows that ADHD symptoms in late childhood can set in motion a negative progression of academic performance, mainly by way of stability of behaviors and relations to early, poorer academic performance.

So, is academic underperformance influenced by subject perspective when also considering the influence of ADHD symptoms? Using our specific framework, the results show that academic performance is more influenced by ADHD symptoms and previous academic performance; self-perceptions of academic competence were negligible in this context. That being said, Future Orientation, a different conceptualization of subject perspective, could be a promising future research area for ADHD research. Here we established for the first time that there is a foreboding relationship between ADHD symptoms and this foreseeing subject perspective measure, interestingly even beyond that of the influence of academic performance ability and parental educational level.

Study II

Background and Aims

Another central problem area related to ADHD symptoms is social acceptance. It is well known that children with higher levels of ADHD symptoms are estimated by others to be less skilled at the task of gaining peer acceptance (e.g. Diamantopoulou et al., 2005, 2007; Hoza et al., 2005). The relationship between ODD symptoms and social acceptance is less investigated; however, children with an ODD diagnosis have also been reported to have problems in the social sphere (Burke, Loeber, & Birmaher, 2002). How each behavioral symptom domain specifically relates to social acceptance when considered simultaneously and dimensionally is unknown.

Children's perceptions influence the level of comfort experienced in their peer relationships (Ladd, 1999), although few have studied the self-perceptions of children with disruptive behavior with regard to social acceptance. To hold fairly positive self-evaluations is normative (Alicke & Govorun, 2005) and is thought to be favorable for boosting motivation and diligence (Taylor & Brown, 1994). However, overly positive self-perceptions have been suggested to promote problems with social acceptance (Hoza & Pelham, 1995), increase aggression (Hoza et al., 2010), and have been linked to conduct problems (Kaiser, Hoza, Pelham Jr, Gnagy, & Greiner, 2008).

The subject-perspective phenomenon of overly positive self-evaluations, dubbed the "Positive Illusory Bias" (PIB) by a growing literature, has been associated with ADHD symptoms (Owens et al., 2007). PIB has been found within the social domain for children diagnosed with ADHD (e.g. Hoza et al., 2004, 2002, 1993, 2000), but it is not known whether the PIB is related to ADHD symptoms dimensionally. Furthermore, the potential role of ODD symptomology in the relationship between PIB and an ADHD diagnosis has not been considered in social outcomes, despite the overlap between the two types of disruptive behaviors (August, Realmuto, MacDonald, Nugent, & Crosby, 1996; Biederman, 2005; Cunningham & Boyle, 2002; Drabick, Gadow, Carlson, & Bromet, 2004). This is surprising as there are findings linking self-reported overestimations of performance to aggression (de Castro, Brendgen, Van Boxtel, Vitaro, & Schaeppers, 2007; Hymel, Bowker, & Woody, 1993; Patterson, Kupersmidt, & Griesler, 1990), a characteristic of ODD (Burke, Loeber, & Birmaher, 2004).

Cognitive dysfunction is a well-recognized component of the multifactorial etiology of ADHD. For example, deficient working memory and problems with inhibition have been suggested to play a role in the development of ADHD (Martinussen et al., 2005; Willcutt et al., 2005). Children with ADHD have also consistently been found to have a greater response-time variability during cognitive tasks (Castellanos et al., 2006; Castellanos & Tannock, 2002; Pennington, 2006). Nonetheless, not all children with ADHD have such cognitive deficits (Willcutt et al., 2005). Moreover, links between cognitive dysfunction and ODD have come into question, as they have been found to mainly be explained by co-occurring ADHD symptoms (Brocki, Nyberg, Thorell, & Bohlin, 2007; Forssman, Eninger, Tillman, Rodriguez, & Bohlin, 2010; Thorell & Wåhlstedt, 2006). Taken together this suggests that the different behavioral-symptom domains and cognitive problems could have specific additive and/or interactive effects.

Only two studies have as yet investigated the role of cognitive factors and ADHD symptoms in relation to social acceptance (Biederman et al., 2004; Diamantopoulou et al., 2007). Results from both studies indicate that it is mainly the ADHD symptoms themselves that explain variance in social acceptance. However, both of these studies used an aggregated measure of cognitive functioning, potentially masking any contribution of specific cognitive skills. The role of cognitive factors in relation to the PIB has been investigated in one study of children with clinical levels of ADHD (McQuade et al., 2010). Results showed that all cognitive factors studied (working memory, concept formation, fluency, attention, planning and set shifting) differentiated between children with and without PIB. Again, none of the three studies mentioned above investigated the role of ODD symptoms in their findings.

Do positive illusions of social performance relate to ADHD symptoms specifically? To disentangle the specific contributions of disruptive behaviors and cognitive factors, our aim was to study the interplay of ADHD and ODD symptoms and the cognitive functions of working memory, inhibition and reaction-time variability in predicting other-estimated and self-estimated social acceptance, and the discrepancy between them, i.e. the PIB.

Results

All of the cognitive measures were significantly, negatively related to age (working memory $r=-.41$, inhibition $r=-.31$, reaction-time variability $r=-.42$, $p<.001$, note that higher values of the cognitive measures denote poorer performance). Pearson product-moment correlations between all variables with control for age can be found in Table 1. ADHD and ODD symptoms were highly positively correlated. Both ADHD symptom domains were positively correlated with poorer performance on all of the cognitive factors. ODD

symptoms were positively correlated with poorer working memory performance and a greater reaction-time variability. ADHD and ODD symptoms were negatively related to adult-reported social acceptance and higher adult-reported social acceptance was associated with better performance on the cognitive measures. Child-reported social acceptance was negatively related to the ADHD-symptom domain of inattention. The PIB was positively related to ADHD and ODD symptoms and poorer performance on the cognitive measures.

Table 1. *Pearson's Correlations Partialized by Age (N=86)*

	2.	3.	4.	5.	6.	7.	8.	9.
1. Inatt	.84***	.68***	.26*	.34**	.38***	-.67***	-.25*	.46***
2. Hyp/Im		.78***	.28*	.31**	.50***	-.61***	-.18	.49***
3. ODD			.34**	.21	.37***	-.56***	-.08	.50***
4. WM				.35**	.27*	-.30**	-.10	.25*
5. Inhib					.64***	-.29**	-.05	.33*
6. RTV						-.27*	.05	.42***
7. OE SA							.43***	-.62***
8. SE SA								.32**
9. PIB								

Note: Inatt=Inattention, Hyp/Im= Hyperactivity/Impulsivity, ODD= Oppositional Defiant Disorder, WM= Working Memory, Inhib= Inhibition, RTV= Reaction Time Variability, OR SA= Other-Estimated Social Acceptance, SR SA= Self-Estimated Social Acceptance, PIB= Positive Illusory Bias, higher values of the cognitive measures denote poorer performance * $p < .05$, ** $p < .01$, *** $p < .001$

To investigate the potential main and interactive effects of the behavioral symptoms and cognitive factors on self- and other-estimated social acceptance and the PIB, we tested two different models in a series of hierarchical regression analyses. In both models we entered age into the first step. In Model 1, we entered the cognitive factors into the second step and the behavioral symptoms into the third step. In Model 2, we entered the behavioral symptoms into the second step and the cognitive factors into the third step. This allowed us to examine whether behavioral symptoms contributed beyond the cognitive factors, and vice versa, in predicting the outcomes. Results of the regression analyses for the two models can be found in Table 2.

Table 2. Hierarchical Regression Analyses of Effects of Behavioral Symptoms and Cognitive Factors on Other- and Self-Estimated Social Acceptance and PIB

	Self-Estimated Social Acceptance		Other-Estimated Social Acceptance		PIB	
	ΔR^2	β	ΔR^2	β	ΔR^2	β
Model 1						
<i>Step 1</i>	.01		.00		.01	
Age		-.07		-.05		-.11
<i>Step 2</i>	.02		.14**		.20***	
WM		-.11		-.24		.15
Inhibition		-.10		-.13		.06
RTV		.15		-.15		.38**
<i>Step 3</i>	.08		.35***		.13**	
Inattention		-.30		-.50**		.13
Hyp/Imp		.15		-.05		.00
ODD		.20		-.16		.31*
Model 2						
<i>Step 1</i>	.01		.00		.01	
Age		-.07		-.05		-.11
<i>Step 2</i>	.07		.47***		.28***	
Inattention		-.34		-.55**		.13
Hyp/Imp		-.02		-.01		.14
ODD		.17		-.18		.31*
<i>Step 3</i>	.03		.02		.05	
WM		-.10		-.10		.03
Inhibition		-.05		-.10		.09
RTV		.23		.10		.21

Note: Hyp/Imp= Hyperactivity/Impulsivity, ODD= Oppositional Defiant Disorder, WM= Working Memory, RTV= Reaction-Time Variability, PIB= Positive Illusory Bias, * $p < .05$, ** $p < .01$, *** $p < .001$

Self-estimated social acceptance was not explained by any of the independent variables in the regression analyses, in either model, $p > .05$. The results of Model 1 showed that, given the cognitive factors, inattention independently contributed significantly to other-estimated social acceptance. Model 1 also showed that ODD independently contributed significantly to PIB beyond the cognitive factors (this significance-level does not hold for Bonferroni corrected p -level). The results of Model 2 showed that none of the cognitive factors contributed beyond the behavioral symptoms.

To assess potential interaction effects all independent variables were first centered. We then entered the interaction terms between the behavioral symptoms and the cognitive factors in a fourth step of the hierarchical regression analyses described above, each interaction in separate analyses. An

interaction effect between ODD and RTV was found for the PIB, $\Delta R^2 = .04$, $\beta = .24$, $p < .05$.

Conclusions

Self-estimated social acceptance was not explained by any of our variables in the regressions, despite a significant negative bivariate correlation with inattention. It is clear that more needs to be known about the individual's perspective than that which can be provided by the straightforward measure of level of self-reported acceptance. It is primarily symptoms of inattention that contribute to other-estimated social acceptance. This points to the need to understand the processes behind how social interaction is disrupted by inattentive behavior.

It had been repeatedly proposed by previous research that ADHD symptoms were associated with an "overly" positive subjective evaluation of their social performance (e.g. Hoza et al., 2004, 2002, 1993, 2000). We found that the PIB related more to ODD symptoms than ADHD symptoms in our model. Even though this association should be judged cautiously, as the independent relationship to ODD did not hold for control for multiple testing, it is a finding worthy of further investigation. Future investigations of PIB should include measures of ODD, since their overlap could explain findings linking ADHD symptoms to the PIB. Additionally, we found bivariate relationships between all cognitive measures and the PIB, but as demonstrated in the regressions their impact seemed to go via their behavioral expressions. Finally, just the fact that we found that some children overestimated and some underestimated, could explain inconsistencies in the literature with regard to how individuals perceive themselves.

Study III

Background and Aims

Is there really a link between disorganized attachment and ADHD? Study II brought about an interest in more encompassing measures of the individual's perspective. Attachment theory provides us with such a measure. According to attachment theory, an infant's experiences with primary caregivers give rise to mental representations that are consolidated in childhood as internal working models. By helping to regulate the child's understanding of social interactions these internal representations can be seen as a lens through which the individual perceives social reality.

When studied beyond the toddler period, attachment is typically assessed by considering the child's verbal responses to a story-stem completion task. The story stems used are meant to trigger secure-base seeking schemata by describing circumstances of distress, threat, separation and/or reunion involving a parental figure. The narrative the child produces in response to the story stem is thought to reflect the child's representation of the attachment relationship and is categorized according to how the child addresses the attachment problem in the attachment story-stem.

Associations between ADHD symptoms and insecure attachment representations, primarily disorganization, have been found using story-stem methodology (e.g. Bohlin et al., 2012; Goldwyn et al., 2000; Thorell et al., 2012). However, because attachment classification coding relies on both narrative organization and content it could be that children with higher levels of ADHD symptoms simply seem to be disorganized due to simultaneous narrative production issues. ADHD symptoms have been related to incoherent narrative production in response to story stems not meant to trigger secure-base seeking impulses (Flory et al., 2006; Lorch et al., 2010; Renz et al., 2003; Tannock et al., 1993). Additionally, more broadly assessed externalizing behaviors have been related to negative narrative content (Von Klitzing et al., 2000; Warren et al., 1996; Zahn-Waxler et al., 1994).

The role of cognitive deficits in the above-mentioned associations between ADHD symptoms, attachment representations and narrative production needs further elucidation. Thorell et al. (2012) found that disorganized attachment (in terms of attachment representations) was positively related to ADHD symptoms longitudinally, independently of cognitive deficits and conduct problems. Bohlin et al. (2012) on the other hand, found that disor-

ganized attachment co-varied with cognitive deficits and conduct problems when predicting ADHD symptoms in a longitudinal design.

The overall aim of the present study was to investigate ADHD symptoms in relation to attachment representations, while considering concurrent conduct problems, cognitive deficits and narrative responses to non-attachment related story stems. In doing this we addressed the issue of whether children with high levels of ADHD symptoms could falsely be categorized as disorganized due to coinciding issues with narrative production.

Results

There was no significant difference between the attachment categories with regard to maternal education, parental immigrant status or living situation ($p > .05$). There was a gender difference with regard to attachment category, $\chi^2 = 6.03$, $p = .05$: 83% of the girls and 59% of the boys were categorized as secure, and all 10 of the children categorized as disorganized were boys. Boys were significantly more incoherent, $t(87) = -3.79$, $p < .001$, and their narratives included more negative events, $t(87) = -1.99$, $p = .05$. There was an age difference for attachment category, with the secure children being the oldest, $F(2, 86) = 3.02$, $p = .05$. Age was also positively related to vocabulary, $r = .39$, $p < .001$, negatively related to cognitive measures (higher numbers indicated poorer performance) and to narrative features, $r = -.31$ to $-.41$, $p < .01$. Gender and age were used as covariates in the remaining analyses based on these findings.

Correlations between all continuous variables can be found in Table 3. ADHD symptoms were positively related to conduct problems, cognitive deficits and narrative problems. Additionally, incoherence was positively related to working-memory deficits and sustained attention problems. Negative content in narrative responses was also positively related to conduct problems and sustained attention problems. Incoherence and negative content were moderately, positively correlated. Vocabulary was negatively related to cognitive deficits, but was not related to behavioral problems or narrative features.

Table 3. *Partial Pearson correlations between continuous variables controlling for age and gender (N=89),*

	2.	3.	4.	5.	6.	7.	8.
1. ADHD	.74**	-.10	.27*	.25*	.41***	.24*	.37***
2. Conduct Problems		-.13	.22*	.32**	.29**	.20	.26*
3. Vocabulary			-.27*	-.48***	-.29*	-.17	-.06
4. Inhibition				.20	.42***	-.01	.06
5. Working memory					.42***	.26*	.15
6. Sustained attention						.25*	.25*
7. Incoherence							.40***
8. Negative content							

Note: * $p < .05$, ** $p < .01$, *** $p < .001$, keep in mind that the cognitive measures reflect poorer performance

A series of analysis of covariance (ANCOVA), controlling for age and gender, revealed significant associations between attachment category and ADHD symptoms, incoherence and negative narrative content. See Table 4.

Table 4. *Results of ANCOVAs on ADHD symptoms, conduct problems, objective performance measures, by attachment category, controlling for age and gender*

	1. Secure (n=58)	2. Organized Insecure (n=21)	3. Disorganized (n=10)	F	Sig. Comparisons
	Adj M (SE)	Adj M (SE)	Adj M (SE)		
ADHD	.67 (.08)	.98 (.14)	1.38 (.20)	5.90**	1 vs 3 **
Conduct Problems	1.87 (.09)	1.99 (.16)	2.09 (.23)	.48	
Vocabulary	16.31 (.65)	17.71 (1.07)	17.32 (1.58)	.66	
Inhibition	4.13 (.42)	3.94 (.69)	4.19 (1.02)	.03	
Working Memory	13.10 (.79)	12.34 (1.30)	16.12 (1.92)	1.4	
Sustained Attention	-.11 (.09)	.11 (.14)	.40 (.21)	2.76	
Incoherence	2.84 (.09)	3.09 (.14)	3.70 (.21)	6.99**	1 vs 3**
Negative content	1.70 (.10)	2.27 (.16)	3.31 (.24)	19.85**	1 vs 2* 1 vs 3*** 2 vs 3**

Note: higher numbers indicated poorer performance on cognitive measures,
* $p < .05$, ** $p < .01$, *** $p < .001$

Only in cases of a significant ANCOVA the three attachment categories were compared using Bonferroni corrections. Significant comparisons are also found in Table 5. The disorganized category had a significantly higher level of ADHD symptoms as compared to the secure category. Children categorized as disorganized were also more incoherent than those categorized as secure. Finally, negative content subsequently increased across the attachment categories; the secure category having the least negative content and the disorganized category having the most negative content.

Because we found associations between attachment category, ADHD symptoms, incoherence and negative content, we performed two final ANCOVAs testing the association between attachment category and ADHD symptoms with additional control for the separate narrative problems. Again all of the attachment categories were compared using Bonferroni corrected comparisons. The association between attachment and ADHD symptoms remained significant with control for incoherence, $F(2, 83)=3.80, p<.05$ (secure vs. disorganized $p<.05$). However, when controlled for negative content, the association between attachment and ADHD symptoms was no longer significant, $F(2, 83)= 1.46, p>.10$.

Conclusions

It is not clear whether attachment disorganization, as assessed via attachment representations, is associated with ADHD symptoms. Our results indicate that children with high levels of ADHD symptoms could falsely appear to be insecurely attached due to a narrative “mindset” that is characterized by a propensity to include negative content. It could be that there is some part of ADHD symptomology that simply predisposes negative narrative content in general. At the same time, our results cannot rule out that attachment insecurity contributes to ADHD symptoms, as little is known of the propensity of insecure children to produce negative content in response to non-attachment related story stems. It is possible that insecurity in itself makes it more likely that children will produce negative content in response to all types of story stems. Furthermore, both of the above explanations could be true, there could very well be two (or more) paths leading to the inclusion of negative content.

What is clear is that the insight we have been given into the individual’s perspective via attachment representations and narrative content, paints a dark picture of ADHD symptoms specifically, as the potential role of conduct problems and cognitive deficits was ruled out by our data. This study adds new information by showing that the (still) questionable link between disorganized attachment representations and ADHD symptoms is not accounted for by the overlap with cognitive deficits or conduct problems. The use of story-stem methodology in investigating the contribution of attachment to the etiology of ADHD needs to be further problematized.

General Discussion

This thesis presents empirical studies combining objective performance measures and measures tapping into subject perspective with the aim of providing a more nuanced view of ADHD symptomology. Grounded in the dimensional approach to ADHD outlined in the introduction, the three studies presented here investigated ADHD across a range of symptom severity, using a symptom-rating scale measure, and actively sought to include participants with a wide range of symptoms. Study I was longitudinal, following children into adolescence, while Study II and Study III were cross-sectional, all investigating separate samples of school-age children.

These empirical studies covered three different areas of interest needing further investigation. Results showed that the merger of objective perspective and subject perspective answered several key questions with regard to ADHD and also gave rise to important new ones. This general discussion appraises key findings, implications, and ultimately the merger of objective performance and subject perspective. Limitations and strengths and suggestions for further research are discussed throughout.

As much of the earlier research on ADHD has focused on objective performance, here I begin with what we learned about ADHD symptoms and objective performance. That is followed by a discussion addressing subject perspective. Subsequently our merger of ADHD symptoms, objective performance and subject perspective is evaluated. And finally, final conclusions are drawn.

What Did We Learn About ADHD Symptoms and Objective Performance?

Study I investigated paths within a framework spanning six years. Studying the influence of a range of ADHD symptoms this way allowed for the investigation of this influence in conjunction with several factors found by previous research to be of concern for the development of school careers, and importantly, over time. This takes into account that early and later symptoms could have different roles. Our results showed that ADHD symptoms and academic performance are both stable over time. We learned that ADHD symptoms in late childhood can set a negative progression of academic per-

formance in motion, by way of stability of behaviors and relations to early low academic performance. Within our framework, the findings indicate that self-perceptions of academic competence in late adolescence are negligible within the larger context of ADHD symptoms and academic performance from late childhood to late adolescence. That said, based on these results, we cannot rule out the role of academic self-perceptions. Self-perceptions of academic competence could be important earlier on in life, as we only tested this variable in 11th grade. The message to the politicians and policy-makers involved in the educational system is that to curb non-optimal academic performance during late adolescence, the most productive efforts would be early investments to reduce ADHD symptoms and to support early school performance. Tracing this framework back to school debut could tell us more about just how early this detrimental influence is in place.

Previous research has consistently found negative concurrent and longitudinal influences of ADHD symptoms on academic performance (Frazier et al. 2007; Loe & Feldman, 2007), as did we with regard to the earlier measures of academic performance and ADHD symptoms. However, surprisingly, ADHD symptoms in 11th grade had a small, albeit significant, positive influence on academic performance in 12th grade. This unexpected finding requires some extended discussion, as it is unparalleled in the literature. Perhaps this late in development, adolescents have learned how to take advantage of certain aspects of their ADHD behaviors and used them to their advantage. Another possible explanation is that this result simply reflects a suppressor effect, i.e. when freed from variance from other predictors certain “up and go/on the move” ADHD behaviors had a positive influence on performance. This unexpected finding could also be a byproduct of the Swedish school system. After ninth grade Swedish students choose between various school programs – these are either more vocational or academically oriented. A widely discussed potential residual of the Swedish educational-track system is that grades in the same subjects require different amounts of effort depending on which educational program is being followed (SOU 2002:120).

The positive influence of ADHD symptoms in the 11th grade on grades in 12th grade (and relatively small negative influence on concurrent grades) we found could reflect grading inflation specific to certain educational programs. Children with higher levels of ADHD symptoms could quite possibly have chosen school programs that give grades that require less of them in the core school subjects of Swedish, Math and English. In this light, the absence of educational track in the model could be seen as a serious limitation. However, if anything this selection effect would have deflated the “true” negative influence of ADHD symptoms on academic performance past the ninth grade. Future investigations of the progression of school careers in countries where children choose school programs should most definitely include educational track as a variable and/or supplement academic performance

measures with national test scores to capture academic performance more adequately. Such endeavors could also tell us more about grade inflation and it is a serious matter if students with higher levels of ADHD symptoms are systematically being held to lower standards.

Study II and III used various cognitive performance measures previously found to be associated with ADHD symptoms. In both studies higher symptom levels were significantly related to poorer performance in bivariate correlations. However, cognitive performance did not explain as much as we expected in either study; any eventual overlap with other variables was overshadowed by the impact of behavioral symptoms. This of course does not mean that the role of cognitive performance in children with ADHD can be completely disregarded. The studies here used a limited amount of tasks to reflect each cognitive skill, and the measures themselves were not exhaustive. These results are however in line with others showing that outcomes of the more “social” nature are more related to the behavioral expressions of the disorder, whereas cognitive measures are more related to academic performance (Biederman et al., 2004; Diamantopoulou et al., 2007). Perhaps the cognitive deficits are in a sense too distant from the social outcomes, inasmuch as their influence goes via higher-order functions and/or mechanisms.

Study III introduced such a “higher order” objective performance measure – narrative coherence. Producing a narrative response that makes sense to the listener requires the cognitive capacity to sequence it in a proficient manner, and provide links between actions and goals in an organized way. In line with previous research we found that incoherence was related to ADHD symptoms (Flory et al., 2006; Lorch et al., 2010; Renz et al., 2003; Tannock et al., 1993), although not independent of attachment. Any ADHD research with focus on narrative production ability or interested in the coherence of responses, must mind the potential overlap with attachment. Our results indicate that this area of research could be dealing with a “chicken or egg” situation similar to the one we attempted to address with regard to ADHD and attachment representations. Is the incoherence that research has reported to be associated with ADHD instead really an effect of disorganized attachment? Investigations along these lines must carefully consider the content of the stimuli used to evoke narrative responses, a topic discussed in more detail below in conjunction with our findings about attachment representations.

In sum, we did find some interesting and surprising results with regard to objective performance; results that challenge previous research and that have practical implications. Importantly, objective performance was problematized by subject perspective and that should inspire the continued questioning of objective performance findings in the light of the subject perspective.

What Did Subject Perspective Tell Us?

Study I addressed the question of whether academic underperformance is influenced by subject perspective. Results indicated that the subject's perspective in terms of self-perception of academic competence in late adolescence did not play a significant role when also considering the negative influence of ADHD symptoms. The paths to and from self-perceptions of academic competence were not significant in our model. This result importantly questions the findings of the associations between positive self-perceptions of competence and better academic achievement (Guay et al., 2003; Marsh & O'Mara, 2008; Stringer & Heath, 2008; Zanobini & Usai, 2002).

Efforts to boost self-perceptions of competence could be an insufficient use of time and effort when looking to improve grades for those with ADHD symptoms in late adolescence. In fact, others have found that boosting self-perceptions could be harmful to the academic performance of already low performing adult students. In a field experiment on college psychology students with the lowest grades, Forsyth et al. (2007), found that, compared to others with equally low grades, students who received feedback aimed at bolstering self-esteem, performed even worse during the course. Schools, politicians and policy-makers alike should take heed of the research debunking the myth of the almighty power of positive self-perceptions if they want to spend their money on enhancing performance. That being said, these kinds of evaluative self-perceptions could influence the individual profoundly in other ways. Even though our findings indicate that self-perceptions of competence do not influence academic performance or ADHD symptoms, self-perceptions of competence could be related to internalizing problems, another serious issue associated with ADHD symptoms during the school years (Eiraldi, Power, & Nezu, 1997; Gaub & Carlson, 1997; Leech, Larkby, Day, & Day, 2006; Power, Costigan, Eiraldi, & Leff, 2004).

The subject-perspective construct Future Orientation investigated in Study I, provided completely new information about how ADHD symptoms relate to future outlook. Our findings are novel in showing that adolescents on the cusp of adulthood with higher levels of ADHD symptoms, are not only leaving school with a history of poor academic performance, they are also more likely to be approaching their future with a negative outlook on employment and further education. Remarkably, the influence of ADHD symptoms on future outlook was beyond the influence of academic performance and family SES even in this low risk sample. This information should be very useful for school counselors when counseling young adolescents. With negative future sentiments rooted in poor academic performance, they might need help finding future domains of competence in life. Discussions of how some university settings are actually less restraining than the school environment the students are used to could also contribute to a brighter outlook on future education. Reinforcing that not all vocations are sedentary or

drain attentional resources could also help them envision a more positive future in the workforce.

The future-outlook construct used here was limited as it focused only on the educational and employment future-life domains. Other aspects of life such as family and friends are of course also important. Future outlook on these more social areas of life could be very different and perhaps of particular importance for adolescents. Considering the substantial peer difficulties experienced by those with ADHD, it is likely they hold pessimistic views of how their social and family life will turn out. At the same time, considering what we know about the heterogeneous nature of the ADHD, there could very well be those venturing off to the future with optimistic outlooks.

Study II asked whether positive illusions of social underperformance relate to ADHD symptoms specifically. In our study, straightforward self-perceptions of social acceptance were not explained by behavioral symptoms or cognitive performance. When we reframed these same self-perceptions with the help of objective performance measures (here parental and teacher estimations of social acceptance), we found that the PIB (positive illusory bias) was positively related to inattention symptoms in bivariate analyses. But, when the overlap with ODD was considered, the PIB was more linked to ODD symptoms. These results question the studies linking PIB to ADHD symptoms, as they did so without control for comorbid ODD (e.g. Hoza et al., 2004, 2010, 2002, 1993, 2000). It could very well be that it is primarily ODD that is associated with overestimations of social acceptance, which in turn could explain findings linking self-reported overestimations of performance to aggression (de Castro et al., 2007; Hymel et al., 1993; Patterson et al., 1990), a characteristic of ODD (Burke et al., 2004). Samples recruited to reflect higher levels of ODD symptoms could tell us more about the role of PIB. The levels of ODD in our sample were not necessarily sufficient to detect less robust relations.

The results of Study II with regard to self-perceptions and ADHD symptoms together highlight the importance of taking into consideration differences in the valence of self-perceptions. Within the same sample, some children could be overestimating and others underestimating their social performance, and this heterogeneity in self-perceptions could statistically mask their relations to other variables of interest. In other words, there is a dimension of relativity that should be considered in subject perspective. A disconnect between how the individual views the world and how others view that shared world can carry meaning, here demonstrated in associations with problem behaviors. This meaning can only be captured by approaches that take into consideration multiple perspectives.

In Study II we used an aggregated measure of other-estimated social acceptance, using reports from teachers and parents. An obvious point of view that should be included in future research is that of peers. Our main focus here was a first attempt to question the association between PIB, as tradi-

tionally defined, and ADHD symptoms using the dimensional approach to ADHD. We, for the first time, also took into consideration cognitive aspects and ODD symptoms, and our results allowed for the questioning of the association between ADHD and PIB, which is so widespread in the PIB literature. The issue of how to “correctly” calculate discrepancy scores is very much still under debate in this field and some suggest the use of residual difference scores instead of the typically used standardized discrepancy score, as it can be seen to be more aligned with the concept of *biased* self-perceptions (Stephens, Kistner, & Lynch, 2014). The residual score represents self-perceptions that are either more or less positive than would be expected and can be used flexibly for the identification of participants as holding particularly biased self-perceptions.

Beyond this important methodological issue, I would also like to call for more theoretical discussion on several other more elemental aspects of the PIB construct; for example, the definition itself is completely from an external view – a view that we should recognize will never be completely objective. Peers’, teachers’ and parents’ views are also in many ways biased; how do their biases play into the subject’s perspective? There is a lack of investigations of proposed causes for the bias. We did not find associations with cognitive performance, however; our measures were in no way exhaustive. There could also be multiple paths leading to this bias. It would be interesting to see how it relates to personality dimensions or callous and unemotional traits. Furthermore, what is meant by “illusory”? If a child holds these views and behaves in accordance with them, there is nothing illusory about them.

Diverging from self-reports, Study III approached the subject’s perspective in a more encompassing manner. Here conceptualized as representations of the attachment relationship or “frame of mind” during narrative production, the subject’s perspective gave us the tools to dig to the very bottom of the attachment perspective on the background to ADHD. Previous research has repeatedly connected ADHD to disorganized attachment representations (e.g. Bohlin et al., 2012; Thorell et al., 2012), suggesting that attachment could play a part in ADHD symptomology. Our study indicates that children with higher levels of ADHD had a tendency to include negative content in concurrent narratives in response to story stems without attachment content, beyond what could be explained by attachment. These results demonstrate that children with high levels of ADHD symptoms could in fact falsely appear to be disorganized due to a negative mindset. This novel finding seriously questions the use of story-stem methodology when assessing attachment representations in children with ADHD symptoms. Because attachment classification partly relies on judgments of the negativity of narratives, it is not clear what is being measured – negative “frame of mind” or attachment.

Perhaps children with higher levels of ADHD symptoms include negative content in their narrative responses because they have a history of everyday

struggles, conflict and chaos, and this negativity is spilling over into their storylines regardless of their relationship to their caregiver/s. However, if this was the case it is surprising that conduct problems did not have a greater role here. It might also be that the negative content is simply an attempt to stay attentive and complete the narration task. Violent and negative themes are perhaps more arousing for the imagination and therefore something that those with attention problems include in their stories in order to self-stimulate.

Another central point of discussion here is whether we really provided a story stem without any attachment content. The non-attachment related story stems used in Study III, were developed by our research group with the goal of providing a story with a problem to be solved that did not require parental figures to give comfort or protection. However, even if they did not intend to elicit secure-base seeking impulses, all of these non-attachment related stories did include other characters (e.g. friend, teacher, neighbor), i.e. were social in nature. The mechanisms triggering the internal-working models reflected by attachment representations could very well be activated by a story set-up that depicts social interactions, which could explain why incoherence and negativity were related to attachment in our data.

Clearly there is a need for more studies comparing concurrent narrative responses to attachment related and non-attachment related story stems in order to understand whether it is disorganized attachment impulses that are driving narrative responses or whether ADHD symptoms give rise to a disorganized “narrative style”, irrespective of actual child-caregiver attachment representation. At this point in the discussion the pivotal issue becomes what story-stem content can, in a true sense, be considered non-attachment related. Results found using story stems involving only acting on, and with, inanimate objects, would perhaps be more convincing; however, it is uncertain whether stories involving inanimate objects would elicit responses that could be compared to attachment stories in a meaningful way. It would still be difficult to tease apart whether responses to attachment content reflect the attachment relationship specifically or a more general mindset with regard to social interactions when comparing responses to attachment content to responses to “inanimate” content. Future research should compare attachment content to social content and to inanimate content and, importantly, consider comparing groups with and without ADHD.

What about other attachment methods? There is a more direct measure of attachment that can be used in younger school children. The Child Attachment Interview, for example, is intended for children of 8-13 years old (CAI, (Target, Fonagy, & Shmueli-Goetz, 2003). The CAI includes questions such as “What happens when you hurt yourself?” and “Can you tell me about a time when you were upset and wanted help?”. Instead of eliciting attachment representations via story stems or pictures of separation situations, as in the Separation Anxiety Test, CAI aims to overcome the “measurement gap” by

asking direct questions about attachment experiences, similar to the Adult Attachment Interview (Cassidy & Shaver, 2008). CAI might be a way to get around the semi-projective nature of story stems and other representational methods; however, it does not circumvent the methodological problem we have highlighted here in regard to ADHD. The CAI classification and coding system uses measures of incoherence and negativity (preoccupied anger and negative descriptions of parents); measures our data indiscriminately related to both attachment and ADHD symptoms. This further stresses the noteworthiness of our findings to the field of attachment research, a field that now needs to think long and hard about whether there can be an attachment representation without a narrative-response. If not, attachment classifications need to consider ADHD symptoms.

In sum, different conceptualizations of subject perspective contributed to a much more nuanced understanding of ADHD symptoms. Our findings have practical and theoretical implications and indicate that future research should take into consideration relativity dimensions of subject perspective, such as mismatch with others, and that the heterogeneity and comorbidity features of ADHD also play a part in subject perspective.

Our Merger of Objective Performance and Subject Perspective When Studying ADHD

Some additional limitations and strengths need to be mentioned. In Study I we used different sources for the ADHD measure at different time points (teachers in sixth grade, parents in 11th grade). Certainly ratings from both parents and teachers at both time points would have been optimal and more in line with the diagnostic criteria found in DSM. However, finding symptom stability using different sources of symptom ratings also speaks for the robustness of ADHD – symptoms were stable over a long period of time, across reporters. A variable left out of our SEM model was comorbid behavior problems. We cannot say whether the various paths were specific to ADHD symptoms or related to other comorbid behaviors. Nonetheless the model allowed for the successful incorporation of several variables found to be influential in the academic realm and gave a unique insight into several very important matters never before tested simultaneously.

Importantly, our recruitment procedures allowed us to investigate the full range of ADHD symptom severity. Information pertaining to the full spectrum of ADHD symptoms in school-aged children should be of interest for parents and educators alike, as their day-to-day interactions with ADHD behaviors are not dictated by diagnostic cut-off points. Study II and Study III also characterized participants in relation to relevant comorbidities, which allowed for a better understanding of the ADHD psychological profile.

Although we intentionally included a balance of both sexes in all of our samples, the scope of these studies was limited inasmuch as research questions here did not specifically intend to investigate sex differences. Gender roles most certainly influence subject perspective and how individuals are evaluated by others. How this influence plays out in children and adolescents with ADHD symptoms absolutely needs further investigation.

In Study III, we set out to evaluate the attachment background to ADHD, but ended up also critically evaluating story-stem methodology and the concept of attachment representations. The questions raised by the results of Study III all touch upon burning theoretical issues that have great meaning for attachment research. The ADHD-research perspective on attachment proved to be a very informative one.

Lastly, I wish to discuss the meaning of my thinking along a divide between behavioral symptoms, objective performance and subject perspective. Hard drawn conceptual divides can lead to misleading rhetoric. This is, for example, exemplified by the rampant either-or conceptual division between “quantitative methods” and “qualitative methods”. Scientific handbooks and method courses often express the idea that there is a definitive choice to be made between the two terms. In truth, data can be quantitative (numerical) or qualitative (words), but the methods used to gather them are neither. In psychological research we can quantify words, and also give qualities to numbers. It is important to keep this in mind when evaluating the knowledge that is generated. What’s more, the conceptual line between quantitative and qualitative does not really reflect a choice between the two. As Miles, Huberman & Saldaña, point out “...numbers and words are both needed if we are to understand the world” (2013, p. 42). Nonetheless, we have to make some conceptual categorizations in order to illuminate relationships and to communicate and compare ideas. The distinction between behavioral symptoms, objective performance and subject perspective that I have made here, originated in a wish to make sense of different perspectives and to advocate for their merger. This division should not be interpreted as the promotion of an unliable categorical approach to these phenomena, as I fundamentally think of these concepts along tangent dimensions.

Final Conclusions

In conclusion, when studied together, what does objective performance, subject perspective and ADHD symptoms tell us? The answer: a lot. ADHD symptoms have a negative influence on academic performance across the later part of mandatory school-life and ADHD symptoms also influence how the individual views their future. We showed that this negative influence goes beyond previous academic performance, even in our low risk sample, which is very telling of the problematic nature of ADHD behaviors in the

school environment. We found that the overlap with ODD could potentially explain the association between ADHD symptoms and a positive subject perspective bias. Comorbidity needs to be addressed when investigating subject perspective aspects and ADHD symptoms.

The insight we have been given into the individual's perspective via attachment representations and narrative content, paints a dark picture of ADHD symptoms. We need to know more about what lies behind this propensity to include negative and violent content in self-generated narratives. The link between disorganized attachment representations and ADHD symptoms is still questionable and, importantly, so is the use of story-stem methodology in investigating the contribution of attachment to the etiology of ADHD.

Finally, I want to implore you to acknowledge the significance of subject's perspective, and think to investigate it from different angles. The findings presented here should motivate the simultaneous inclusion of different perspectives of functioning in ADHD research and, it is hoped, encourage the further development of multifaceted outcome measures. Ultimately, how we perform and how we view things are intertwined, and research in other fields can be greatly informed by the knowledge this research has generated.

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References

- Ainsworth, M. S., Blehar, M. C., Waters, E., & Wall, S., (1978). *Patterns of attachment: A psychological study of the Strange Situation*. Hillsdale, NJ: Erlbaum.
- Ainsworth, M. S., & Bowlby, J. (1991). An ethological approach to personality development. *American Psychologist*, *46*(4), 333-341.
- Alicke, M. D., & Govorun, O. (2005). The better-than-average effect. *The Self in Social Judgment*, 85–106.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders : DSM-IV-TR*. (4th ed., text revision.). Washington D.C.: American Psychiatric Association.
- American Psychiatric Association, American Psychiatric Association, & DSM-5 Task Force. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5*. Washington, D.C.: American Psychiatric Association.
- Angold, A., Costello, E. J., & Erkanli, A. (1999). Comorbidity. *Journal of Child Psychology and Psychiatry*, *40*(01), 57–87.
- August, G. J., Realmuto, G. M., MacDonald, A. W., Nugent, S. M., & Crosby, R. (1996). Prevalence of ADHD and comorbid disorders among elementary school children screened for disruptive behavior. *Journal of Abnormal Child Psychology*, *24*(5), 571–595.
- Bagwell, C. L., Molina, B. S., Pelham, W. E., & Hoza, B. (2001). Attention-deficit hyperactivity disorder and problems in peer relations: predictions from childhood to adolescence. *Journal of the American Academy of Child & Adolescent Psychiatry*, *40*(11), 1285–1292.
- Barkley, R. (2006). *Attention-deficit hyperactivity disorder: a handbook for diagnosis and treatment*. New York: Guilford Press.
- Barkley, R. A. (1997a). *ADHD and the nature of self-control*. New York: The Guilford Press.
- Barkley, R. A. (1997b). Behavioral inhibition, sustained attention, and executive functions: Constructing a unifying theory of ADHD. *Psychological Bulletin*, *121*, 65–94.
- Barkley, R. A., Cook, E. H., Diamond, A., Zametkin, A., Thapar, A., Teeter, A., & others. (2002). International consensus statement on ADHD. January 2002. *Clinical Child and Family Psychology Review*, *5*(2), 89–111.
- Barkley, R. A., Fischer, M., Smallish, L., & Fletcher, K. (2002). The persistence of attention-deficit/hyperactivity disorder into young adulthood as a function of reporting source and definition of disorder. *Journal of Abnormal Psychology*, *111*(2), 279-289.
- Barkley, R. A., Fischer, M., Smallish, L., & Fletcher, K. (2006). Young adult outcome of hyperactive children: Adaptive functioning in major life activities. *Journal of the American Academy of Child & Adolescent Psychiatry*, *45*(2), 192–202.
- Barkley, R. A., Murphy, K. R., & Fischer, M. (2010). *ADHD in adults: What the science says*. Guilford Press.

- Bauermeister, J. J., ShROUT, P. E., Ramírez, R., Bravo, M., Alegría, M., Martínez-Taboas, A., ... Ribera, J. C. (2007). ADHD correlates, comorbidity, and impairment in community and treated samples of children and adolescents. *Journal of Abnormal Child Psychology*, *35*(6), 883–898.
- Beal, S. J., & Crockett, L. J. (2010). Adolescents' occupational and educational aspirations and expectations: Links to high school activities and adult educational attainment. *Developmental Psychology*, *46*(1), 258–265.
- Berlin, L., & Bohlin, G. (2002). Response inhibition, hyperactivity, and conduct problems among preschool children. *Journal of Clinical Child and Adolescent Psychology*, *31*(2), 242–251.
- Berwid, O. G., Curko Kera, E. A., Marks, D. J., Santra, A., Bender, H. A., & Halperin, J. M. (2005). Sustained attention and response inhibition in young children at risk for Attention Deficit/Hyperactivity Disorder. *Journal of Child Psychology and Psychiatry*, *46*(11), 1219–1229.
- Biederman, J. (2005). Attention-deficit/hyperactivity disorder: a selective overview. *Biological Psychiatry*, *57*(11), 1215–1220.
- Biederman J, Faraone SV, & Monuteaux MC. (2002). Differential effect of environmental adversity by gender: Rutter's index of adversity in a group of boys and girls with and without ADHD. *The American Journal of Psychiatry*, *159*(9), 1556–62.
- Biederman, J., Mick, E., & Faraone, S. V. (2000). Age-dependent decline of symptoms of attention deficit hyperactivity disorder: impact of remission definition and symptom type. *American Journal of Psychiatry*, *157*, 816–818.
- Biederman, J., Monuteaux, M. C., Doyle, A. E., Seidman, L. J., Wilens, T. E., Ferrero, F., ... Faraone, S. V. (2004). Impact of executive function deficits and Attention-Deficit/Hyperactivity Disorder (ADHD) on academic outcomes in children. *Journal of Consulting and Clinical Psychology*, *72*(5), 757–766.
- Bohlin, G., Eninger, L., Brocki, K. C., & Thorell, L. B. (2012). Disorganized attachment and inhibitory capacity: Predicting externalizing problem behaviors. *Journal of Abnormal Child Psychology*, *40*(3), 449–458.
- Bretherton, I., & Munholland, K. A. (2008). Internal working models in attachment relationships: Elaborating a central construct in attachment theory. Internal working models in attachment relationships: Elaborating a central construct in attachment theory J. Cassidy P. R. Shaver (Ed.), *Handbook of attachment: Theory, research, and clinical applications (2nd ed.)* (pp. 102–127). New York, NY, US: Guilford Press.
- Bretherton, I., & Oppenheim, D. (2003). The MacArthur Story Stem Battery: Development, administration, reliability, validity, and reflections about meaning. In R. N. Emde, D. P. Wolf, & D. Oppenheim (Eds.), *Revealing the inner worlds of young children: The MacArthur Story Stem Battery and parent child narratives* (pp. 55–80). Oxford: Oxford University Press.
- Bretherton, I., Ridgeway, D., & Cassidy, J. (1990). Assessing internal working models of the attachment relationship. In M. Greenberg, D. Cicchetti, & E. M. Cummings (Eds.), *Attachment in the preschool years: Theory, research, and intervention* (pp. 273–308). Chicago: University of Chicago Press.
- Brocki, K. C., Nyberg, L., Thorell, L. B., & Bohlin, G. (2007). Early concurrent and longitudinal symptoms of ADHD and ODD: relations to different types of inhibitory control and working memory. *Journal of Child Psychology and Psychiatry*, *48*(10), 1033–1041.
- Burke, J. D., Loeber, R., & Birmaher, B. (2002). Oppositional defiant disorder and conduct disorder: a review of the past 10 years, part II. *Journal of the American Academy of Child & Adolescent Psychiatry*, *41*(11), 1275–1293.

- Burke, J. D., Loeber, R., & Birmaher, B. (2004). Oppositional defiant disorder and conduct disorder: a review of the past 10 years, part II. *American Academy of Child, 2*(4), 1275–1293.
- Bussing, R., Zima, B. T., Mason, D. M., Meyer, J. M., White, K., & Garvan, C. W. (2012). ADHD knowledge, perceptions, and information sources: perspectives from a community sample of adolescents and their parents. *Journal of Adolescent Health, 51*(6), 593–600.
- Carlson, C. L., Shin, M., & Booth, J. (1999). The case for DSM-IV subtypes in ADHD. *Mental Retardation and Developmental Disabilities Research Reviews, 5*(3), 199–206.
- Caron, C., & Rutter, M. (1991). Comorbidity in child psychopathology: Concepts, issues and research strategies. *JCPP Journal of Child Psychology and Psychiatry, 32*(7), 1063–1080.
- Cassidy, J., & Shaver, P. R. (2008). *Handbook of attachment: theory, research, and clinical applications*. New York: Guilford Press.
- Castellanos, F. X., Sonuga-Barke, E. J. S., Milham, M. P., & Tannock, R. (2006). Characterizing cognition in ADHD: beyond executive dysfunction. *Trends in Cognitive Sciences, 10*(3), 117–123.
- Castellanos, F. X., & Tannock, R. (2002). Neuroscience of attention-deficit/hyperactivity disorder: The search for endophenotypes. *Nature Reviews Neuroscience, 3*(8), 617–628.
- Clarke, L., Ungerer, J., Chahoud, K., Johnson, S., & Stiefel, I. (2002). Attention deficit hyperactivity disorder is associated with attachment insecurity. *Clinical Child Psychology and Psychiatry, 7*(2), 179–198.
- Coghill, D. R., Seth, S., & Matthews, K. (2013). A comprehensive assessment of memory, delay aversion, timing, inhibition, decision making and variability in attention deficit hyperactivity disorder: advancing beyond the three-pathway models. *Psychological Medicine, 44*(9), 1–13.
- Coghill, D., & Sonuga-Barke, E. J. (2012). Annual research review: categories versus dimensions in the classification and conceptualisation of child and adolescent mental disorders—implications of recent empirical study. *Journal of Child Psychology and Psychiatry, 53*(5), 469–489.
- Cole, D. A., Gondoli, D. M., & Peeke, L. G. (1998). Structure and validity of parent and teacher perceptions of children's competence: A multitrait–multimethod–multigroup investigation. *Psychological Assessment, 10*(3), 241–249.
- Counts, C. A., Nigg, J. T., Stawicki, J. A., Rappley, M. D., & Von Eye, A. (2005). Family adversity in DSM-IV ADHD combined and inattentive subtypes and associated disruptive behavior problems. *Journal of the American Academy of Child & Adolescent Psychiatry, 44*(7), 690–698.
- Cunningham, C. E., & Boyle, M. H. (2002). Preschoolers at risk for attention-deficit hyperactivity disorder and oppositional defiant disorder: family, parenting, and behavioral correlates. *Journal of Abnormal Child Psychology, 30*(6), 555–569.
- Daley, D., Jones, K., Hutchings, J., & Thompson, M. (2009). Attention deficit hyperactivity disorder in pre-school children: current findings, recommended interventions and future directions. *Child: Care, Health and Development, 35*(6), 754–766.
- de Castro, B. O., Brendgen, M., Van Boxtel, H., Vitaro, F., & Schaeppers, L. (2007). “Accept me, or else...”: Disputed overestimation of social competence predicts increases in proactive aggression. *Journal of Abnormal Child Psychology, 35*(2), 165–178.

- Diamantopoulou, S., Henricsson, L., & Rydell, A. M. (2005). ADHD symptoms and peer relations of children in a community sample: Examining associated problems, self-perceptions, and gender differences. *International Journal of Behavioral Development, 29*(5), 388–398.
- Diamantopoulou, S., Rydell, A. M., Thorell, L. B., & Bohlin, G. (2007). Impact of executive functioning and symptoms of Attention Deficit Hyperactivity Disorder on children's peer relations and school performance. *Developmental Neuropsychology, 32*(1), 521–542.
- Diener, E. (2009). Subjective well-being. In *The science of well-being* (pp. 11–58). Springer. Retrieved from http://link.springer.com/chapter/10.1007/978-90-481-2350-6_2
- Döpfner, M., Hautmann, C., Görtz-Dorten, A., Klasen, F., Ravens-Sieberer, U., group, B. study, & others. (2014). Long-term course of ADHD symptoms from childhood to early adulthood in a community sample. *European Child & Adolescent Psychiatry, 1*–9.
- Douglas, V. I. (1999). Cognitive control processes in attention deficit/hyperactivity disorder. In *Handbook of disruptive behavior disorders* (pp. 105–138). Springer. Retrieved from http://link.springer.com/chapter/10.1007/978-1-4615-4881-2_5
- Drabick, D. A. ., Gadow, K. D., Carlson, G. A., & Bromet, E. J. (2004). ODD and ADHD symptoms in Ukrainian children: External validators and comorbidity. *Journal of the American Academy of Child & Adolescent Psychiatry, 43*(6), 735–743.
- Dubow, E. F., Boxer, P., & Huesmann, L. R. (2009). Long-term effects of parents' education on children's educational and occupational success: Mediation by family interactions, child aggression, and teenage aspirations. *Merrill-Palmer Quarterly, 55*(3), 224–249.
- DuPaul, G. J., Thomas, J., & Anastopoulos, A. D. (1998). *ADHD rating scale-iv: Checklists, norms, and clinical interpretation*. New York: Guilford Press.
- Eiraldi, R. B., Power, T. J., & Nezu, C. M. (1997). Patterns of comorbidity associated with subtypes of Attention-Deficit/Hyperactivity Disorder among 6- to 12-year-old children. *Journal of the American Academy of Child & Adolescent Psychiatry, 36*(4), 503–514.
- Ellis, A. K. (2014). *Research on Educational Innovations*. Hoboken: Taylor and Francis.
- Evans, S. W., Brady, C. E., Harrison, J. R., Bunford, N., Kern, L., State, T., & Andrews, C. (2013). Measuring ADHD and ODD symptoms and impairment using high school teachers' ratings. *Journal of Clinical Child & Adolescent Psychology, 42*(2), 197–207.
- Faraone, S. V., Biederman, J., & Mick, E. (2006). The age-dependent decline of attention deficit hyperactivity disorder: a meta-analysis of follow-up studies. *Psychological Medicine, 36*(02), 159–165.
- Faraone, S. V., Perlis, R. H., Doyle, A. E., Smoller, J. W., Goralnick, J. J., Holmgren, M. A., & Sklar, P. (2005). Molecular genetics of attention-deficit/hyperactivity disorder. *Biological Psychiatry, 57*(11), 1313–1323.
- Fayyad, J., De Graaf, R., Kessler, R., Alonso, J., Angermeyer, M., Demyttenaere, K., ... others. (2007). Cross-national prevalence and correlates of adult attention-deficit hyperactivity disorder. *The British Journal of Psychiatry, 190*(5), 402–409.
- Fearon, R. P., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Lapsley, A., & Roisman, G. I. (2010). The significance of insecure attachment and disorganization in the development of children's externalizing behavior: a meta-analytic study. *Child Development, 81*(2), 435–456.

- Flory, K., Milich, R., Lorch, E. P., Hayden, A. N., Strange, C., & Welsh, R. (2006). Online story comprehension among children with ADHD: which core deficits are involved? *Journal of Abnormal Child Psychology*, *34*(6), 850–862.
- Forsman, L., Eninger, L., Tillman, C. M., Rodriguez, A., & Bohlin, G. (2010). Cognitive functioning and family risk factors in relation to symptom behaviors of ADHD and ODD in adolescents. *Journal of Attention Disorders*, *XX*(X), 1–11. <http://doi.org/doi: 10.1177/1087054710385065>
- Forsyth, D. R., Lawrence, N. K., Burnette, J. L., & Baumeister, R. F. (2007). Attempting to improve the academic performance of struggling college students by bolstering their self-esteem: An intervention that backfired. *Journal of Social and Clinical Psychology*, *26*(4), 447–459.
- Frazier, T. W., Youngstrom, E. A., Glutting, J. J., & Watkins, M. W. (2007). ADHD and achievement: Meta-analysis of the child, adolescent, and adult literatures and a concomitant study with college students. *Journal of Learning Disabilities*, *40*(1), 49–65.
- Frazier, T. W., Youngstrom, E. A., & Naugle, R. I. (2007). The latent structure of attention-deficit/hyperactivity disorder in a clinic-referred sample. *Neuropsychology*, *21*(1), 45–64.
- Gadow, K. D., DeVincent, C. J., & Pomeroy, J. (2006). ADHD symptom subtypes in children with pervasive developmental disorder. *Journal of Autism and Developmental Disorders*, *36*(2), 271–283.
- Gaub, M., & Carlson, C. L. (1997). Behavioral characteristics of DSM-IV ADHD subtypes in a school-based population. *Journal of Abnormal Child Psychology*, *25*(2), 103–111.
- George, C., & Solomon, J. (2000). Six-Year Attachment Doll Play Classification System. In *Unpublished classification manual*. Oakland: Mills College.
- Gerstadt, C. L., Hong, Y. J., & Diamond, A. (1994). The relationship between cognition and action: performance of children-7 years old on a stroop-like day-night test. *Cognition*, *53*(2), 129–153.
- Gifford-Smith, M. E., & Brownell, C. A. (2003). Childhood peer relationships: Social acceptance, friendships, and peer networks. *Journal of School Psychology*, *41*(4), 235–284.
- Gizer, I. R., Ficks, C., & Waldman, I. D. (2009). Candidate gene studies of ADHD: a meta-analytic review. *Human Genetics*, *126*(1), 51–90.
- Gjone, H., Stevenson, J., & Sundet, J. M. (1996). Genetic influence on parent-reported attention-related problems in a Norwegian general population twin sample. *Journal of the American Academy of Child & Adolescent Psychiatry*, *35*(5), 588–598.
- Goldwyn, R., Stanley, C., Smith, V., & Green, J. (2000). The Manchester Child Attachment Story Task: Relationship with parental AAI, SAT and child behaviour. *Attachment & Human Development*, *2*(1), 71–84.
- Greenberg, M. T., DeKlyen, M., Speltz, M. L., & Endriga, M. C. (1997). The role of attachment processes in externalizing psychopathology in young children. In L. Atkinson & K. J. Zucker (Eds.), *Attachment and psychopathology* (pp. 196–222). New York, NY: Guilford.
- Greenberg, M. T., Speltz, M. L., & DeKlyen, M. (1993). The role of attachment in the early development of disruptive behavior problems. *Development and Psychopathology*, *5*(1-2), 191–213.
- Greene, R. W., Biederman, J., Faraone, S. V., Sienna, M., & Garcia-Jetton, J. (1997). Adolescent outcome of boys with attention-deficit/hyperactivity disorder and social disability: results from a 4-year longitudinal follow-up study. *Journal of Consulting and Clinical Psychology*, *65*(5), 758–767.

- Guay, F., Marsh, H. W., & Boivin, M. (2003). Academic self-concept and academic achievement: Developmental perspectives on their causal ordering. *Journal of Educational Psychology, 95*(1), 124-136.
- Harpin, V. A. (2005). The effect of ADHD on the life of an individual, their family, and community from preschool to adult life. *Archives of Disease in Childhood, 90*:i2-i7.
- Harter, S. (1988). *Manual for the self-perception profile for adolescents*. University of Denver. Denver, CO.
- Haslam, N., Williams, B., Prior, M., Haslam, R., Graetz, B., & Sawyer, M. (2006). The latent structure of attention-deficit/hyperactivity disorder: a taxometric analysis. *Australian and New Zealand Journal of Psychiatry, 40*(8), 639-647.
- Henricsson, L., & Rydell, A. M. (2004). Elementary school children with behavior problems: Teacher-child relations and self-perception. A prospective study. *Merrill-Palmer Quarterly, 50*(2), 111-138.
- Horn, W. F., Wagner, A. E., & Lalongo, N. (1989). Sex differences in school-aged children with pervasive attention deficit hyperactivity disorder. *Journal of Abnormal Child Psychology, 17*(1), 109-125.
- Hoza, B., Gerdes, A. C., Hinshaw, S. P., Arnold, L. E., Pelham, W. E. J., Molina, B. S., Abikoff, H. B., ... Wigal, T. (2004). Self-perceptions of competence in children with ADHD and comparison children. *Journal of Consulting and Clinical Psychology, 72*, 3, 382-391.
- Hoza, B., Mrug, S., Gerdes, A. C., Hinshaw, S. P., Bukowski, W. M., Gold, J. A., ... Arnold, L. E. (2005). What aspects of peer relationships are impaired in children with attention-deficit/hyperactivity disorder? *Journal of Consulting and Clinical Psychology, 73*(3), 411-423.
- Hoza, B., Murray-Close, D., Arnold, L. E., Hinshaw, S. P., & Hechtman, L. (2010). Time-dependent changes in positively biased self-perceptions of children with attention-deficit/hyperactivity disorder: A developmental psychopathology perspective. *Development and Psychopathology, 22*(02), 375-390.
- Hoza, B., Pelham Jr, W. E., Dobbs, J., Owens, J. S., & Pillow, D. R. (2002). Do boys with attention-deficit/hyperactivity disorder have positive illusory self-concepts? *Journal of Abnormal Psychology, 111*(2), 268-278.
- Hoza, B., & Pelham, W. E. (1995). Social-cognitive predictors of treatment response in children with ADHD. *Journal of Social and Clinical Psychology, 14*(1), 23-35.
- Hoza, B., Pelham, W. E., Milich, R., Pillow, D., & McBride, K. (1993). The self-perceptions and attributions of attention deficit hyperactivity disorder and nonreferred boys. *Journal of Abnormal Child Psychology, 21*(3), 271-286.
- Hoza, B., Waschbusch, D. A., Pelham, W. E., Molina, B. S., & Milich, R. (2000). Attention-Deficit/Hyperactivity Disorder and Control Boys' Responses to Social Success and Failure. *Child Development, 71*(2), 432-446.
- Huisman, M., Kunst, A., & Mackenbach, J. (2005). Intelligence and socioeconomic inequalities in health. *The Lancet, 366*(9488), 807-808. [http://doi.org/10.1016/S0140-6736\(05\)67212-1](http://doi.org/10.1016/S0140-6736(05)67212-1)
- Hymel, S., Bowker, A., & Woody, E. (1993). Aggressive versus withdrawn unpopular children: Variations in peer and self-perceptions in multiple domains. *Child Development, 64*(3), 879-896. <http://doi.org/10.1111/j.1467-8624.1993.tb02949.x>
- Hymel, S., & Franke, S. (1985). Children's Peer Relations: Assessing Self-Perceptions. In B. Schneider, K. Rubin, & J. Ledingham (Eds.), *Children's Peer Relations: Issues in Assessment and Intervention* (pp. 75-91). Springer US. Retrieved from http://dx.doi.org/10.1007/978-1-4684-6325-5_5

- Ialongo, N. S., Lopez, M., Horn, W. F., Pascoe, J. M., & Greenberg, G. (1994). Effects of psychostimulant medication on self-perceptions of competence, control, and mood in children with attention deficit hyperactivity disorder. *Journal of Clinical Child & Adolescent Psychology, 23*(2), 161–173.
- Jensen, P. S., Hinshaw, S. P., Kraemer, H. C., Lenora, N., Newcorn, J. H., Abikoff, H. B., ... others. (2001). ADHD comorbidity findings from the MTA study: comparing comorbid subgroups. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*(2), 147–158.
- Johnson, K. A., Kelly, S. P., Bellgrove, M. A., Barry, E., Cox, M., Gill, M., & Robertson, I. H. (2007). Response variability in attention deficit hyperactivity disorder: evidence for neuropsychological heterogeneity. *Neuropsychologia, 45*(4), 630–638.
- Jöreskog, K. G., & Sörbom, D. (1996). *LISREL 8 user's reference guide*. Scientific Software.
- Kadesjö, B., & Gillberg, C. (2001). The comorbidity of ADHD in the general population of Swedish school-age children. *Journal of Child Psychology and Psychiatry, 42*(04), 487–492.
- Kaiser, N. M., Hoza, B., Pelham Jr, W. E., Gnagy, E., & Greiner, A. R. (2008). ADHD status and degree of positive illusions: moderational and mediational relations with actual behavior. *Journal of Attention Disorders, 12*(3), 227–238.
- Kaplan, R., & Saccuzzo, D. (2012). *Psychological testing: Principles, applications, and issues*. Cengage Learning. Retrieved from <http://www.google.com/books?hl=sv&lr=&id=vfIKAAAQBAJ&oi=fnd&pg=PR3&dq=kaplan+psychological+testing&ots=WvUBngbwDS&sig=nLGRt14e8og0GaXlNdxieHWG480>
- Kerns, K. A., & Richardson, R. A. (2005). *Attachment in middle childhood*. New York: Guilford press.
- Kessler, R. C., Adler, L. A., Barkley, R., Biederman, J., Conners, C. K., Faraone, S. V., ... others. (2005). Patterns and predictors of attention-deficit/hyperactivity disorder persistence into adulthood: results from the national comorbidity survey replication. *Biological Psychiatry, 57*(11), 1442–1451.
- Klein, C., Wendling, K., Huettner, P., Ruder, H., & Peper, M. (2006). Intra-subject variability in attention-deficit hyperactivity disorder. *Biological Psychiatry, 60*(10), 1088–1097.
- Kline, R. B. (1998). *Principles and practice of structural equation modeling*. New York: Guilford Press.
- Kraemer, H. C., Noda, A., & O'Hara, R. (2004). Categorical versus dimensional approaches to diagnosis: Methodological challenges. *Journal of Psychiatric Research, 38*(1), 17–25.
- Kuntsi, J., Andreou, P., Ma, J., Börger, N. A., & van der Meere, J. J. (2005). Testing assumptions for endophenotype studies in ADHD: reliability and validity of tasks in a general population sample. *BMC Psychiatry, 5*(1), 40–51.
- Kuriyan, A. B., Pelham, W. E., Molina, B. S. G., Waschbusch, D. A., Gnagy, E. M., Sibley, M. H., Babinski, D. E., ... Kent, K. M. (2013). Young Adult Educational and Vocational Outcomes of Children Diagnosed with ADHD. *Journal of Abnormal Child Psychology, 41*(1), 27–41.
- Ladd, G. W. (1999). Peer relationships and social competence during early and middle childhood. *Annual Review of Psychology, 50*(1), 333–359.
- Lahey, B. B., Pelham, W. E., Loney, J., Lee, S. S., & Willcutt, E. (2005). Instability of the DSM-IV subtypes of ADHD from preschool through elementary school. *Archives of General Psychiatry, 62*(8), 896–902.

- Larsson, H., Anckarsater, H., Råstam, M., Chang, Z., & Lichtenstein, P. (2012). Childhood attention-deficit hyperactivity disorder as an extreme of a continuous trait: a quantitative genetic study of 8,500 twin pairs. *Journal of Child Psychology and Psychiatry*, 53(1), 73–80.
- Larsson, H., Dilshad, R., Lichtenstein, P., & Barker, E. D. (2011). Developmental trajectories of DSM-IV symptoms of attention-deficit/hyperactivity disorder: genetic effects, family risk and associated psychopathology. *Journal of Child Psychology and Psychiatry*, 52(9), 954–963.
- Lebowitz, M. S. (2013). Stigmatization of ADHD: A developmental review. *Journal of Attention Disorders*, XX(X), 1-7. DOI: 10.1177/1087054712475211
- Leech, S. L., Larkby, C. A., Day, R., & Day, N. L. (2006). Predictors and correlates of high levels of depression and anxiety symptoms among children at age 10. *Journal of the American Academy of Child & Adolescent Psychiatry*, 45(2), 223–230.
- Levy, F., Hay, D. A., McStephen, M., Wood, C., & Waldman, I. (1997). Attention-deficit hyperactivity disorder: A category or a continuum? Genetic analysis of a large-scale twin study. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36(6), 737–744.
- Lijffijt, M., Kenemans, J. L., Verbaten, M. N., & van Engeland, H. (2005). A meta-analytic review of stopping performance in attention-deficit/hyperactivity disorder: deficient inhibitory motor control? *Journal of Abnormal Psychology*, 114(2), 216–222.
- Loeber, R., Burke, J. D., Lahey, B. B., Winters, A., & Zera, M. (2000). Oppositional defiant and conduct disorder: a review of the past 10 years, part I. *Journal of American Academy of Child & Adolescent Psychiatry*, 39(12), 1468–1484.
- Loe, I. M., & Feldman, H. M. (2007). Academic and educational outcomes of children with ADHD. *Journal of Pediatric Psychology*, 32(6), 643–654.
- Lorch, E. P., Milich, R., Flake, R. A., Ohlendorf, J., & Little, S. (2010). A developmental examination of story recall and coherence among children with ADHD. *Journal of Abnormal Child Psychology*, 38(3), 291–301.
- Losier, B. J., McGrath, P. J., & Klein, R. M. (1996). Error patterns on the Continuous Performance Test in non-medicated and medicated samples of children with and without ADHD: A meta-analytic review. *Journal of Child Psychology and Psychiatry*, 37(8), 971–987.
- Madaus, G. F., & O'Dwyer, L. M. (1999). Short history of performance assessment: Lessons learned. *Phi Delta Kappan*, 80(9), 688–695.
- Main, M., & Solomon, J. (1990). Procedures for identifying infants as disorganized/disoriented during the Ainsworth Strange situation. In *Attachment in the pre-school years: Theory, research, and intervention* (pp. 121–160).
- Marcus, D. K., & Barry, T. D. (2011). Does attention-deficit/hyperactivity disorder have a dimensional latent structure? A taxometric analysis. *Journal of Abnormal Psychology*, 120(2), 427–442.
- Marsh, H. W., & O'Mara, A. (2008). Reciprocal effects between academic self-concept, self-esteem, achievement, and attainment over seven adolescent years: Unidimensional and multidimensional perspectives of self-concept. *Personality and Social Psychology Bulletin*, 34(4), 542–552.
- Martinussen, R., Hayden, J., Hogg-Johnson, S., & Tannock, R. (2005). A meta-analysis of working memory impairments in children with attention-deficit/hyperactivity disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, 44(4), 377–384.
- Mash, E. J., & Barkley, R. A. (2009). *Assessment of childhood disorders*. Guilford Press.

- McInerney, R. J., Hrabok, M., & Kerns, K. A. (2005). The children's size-ordering task: A new measure of nonverbal working memory. *Journal of Clinical and Experimental Neuropsychology*, *27*(6), 735–745.
- McLeod, J. D., & Fettes, D. L. (2007). Trajectories of failure: The educational careers of children with mental health problems. *American Journal of Sociology*, *113*(3), 653–701.
- McLeod, J. D., Fettes, D. L., Jensen, P. S., Pescosolido, B. A., & Martin, J. K. (2007). Public knowledge, beliefs, and treatment preferences concerning attention-deficit hyperactivity disorder. *Psychiatric Services*, *58*(5), 626–631.
- McQuade, J. D., Tomb, M., Hoza, B., Waschbusch, D. A., Hurt, E. A., & Vaughn, A. J. (2010). Cognitive deficits and positively biased self-perceptions in children with ADHD. *Journal of Abnormal Child Psychology*, *39*(2), 307–319.
- Mikami, A. Y., & Hinshaw, S. P. (2006). Resilient adolescent adjustment among girls: buffers of childhood peer rejection and attention-deficit/hyperactivity disorder. *Journal of Abnormal Child Psychology*, *34*(6), 823–837.
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2013). *Qualitative Data Analysis: A Methods Sourcebook*. SAGE Publications, Incorporated.
- Moldavsky, M., & Sayal, K. (2013). Knowledge and Attitudes about Attention-Deficit/Hyperactivity Disorder (ADHD) and its Treatment: The Views of Children, Adolescents, Parents, Teachers and Healthcare Professionals. *Current Psychiatry Reports*, *15*(8), 1–7.
- Moss, E., Cyr, C., & Dubois-Comtois, K. (2004). Attachment at early school age and developmental risk: examining family contexts and behavior problems of controlling-caregiving, controlling-punitive, and behaviorally disorganized children. *Developmental Psychology*, *40*(4), 519–532.
- Nigg, J. T. (2006). *What causes ADHD?: Understanding what goes wrong and why*. New York: Guilford Press.
- Nigg, J. T., Willcutt, E. G., Doyle, A. E., & Sonuga-Barke, E. J. S. (2005). Causal heterogeneity in attention-deficit/hyperactivity disorder: Do we need neuropsychologically impaired subtypes? *Biological Psychiatry*, *57*(11), 1224–1230.
- Nurmi, J. E. (1991). How do adolescents see their future? A review of the development of future orientation and planning. *Developmental Review*, *11*(1), 1–59.
- Nurmi, J. E., Seginer, R., & Poole, M. E. (1990). *Future-orientation questionnaire*. Finland: Department of Psychology, Helsinki University.
- Nuttin, J., & Lens, W. (1985). *Future time perspective and motivation: Theory and research method*. Coronet Books.
- Nyberg, L., Henriksen, L., & Rydell, A. M. (2008). Low social inclusion in childhood: adjustment and early predictors. *Early Development and Parenting*, *17*(6), 639–656.
- Oppenheim, D., & Waters, H. S. (1995). Narrative process and attachment representations: Issues of development and assessment. *Monographs of the Society for Research in Child Development*, *60*(2-3), 197–215.
- Owens, J. S., Goldfine, M. E., Evangelista, N. M., Hoza, B., & Kaiser, N. M. (2007). A critical review of self-perceptions and the positive illusory bias in children with ADHD. *Clinical Child and Family Psychology Review*, *10*(4), 335–351.
- Patterson, C. J., Kupersmidt, J. B., & Griesler, P. C. (1990). Children's perceptions of self and of relationships with others as a function of sociometric status. *Child Development*, *61*(5), 1335–1349.
- Pennington, B. F. (2006). From single to multiple deficit models of developmental disorders. *Cognition*, *101*(2), 385–413.

- Pinto, C., Turton, P., Hughes, P., White, S., & Gillberg, C. (2006). ADHD and infant disorganized attachment. *Journal of Attention Disorders, 10*(1), 83–91.
- Pliszka, S. R. (1997). Comorbidity of attention-deficit/hyperactivity disorder with psychiatric disorder: an overview. *The Journal of Clinical Psychiatry, 59*, 50–58.
- Pliszka, S. R. (2000). Patterns of psychiatric comorbidity with attention-deficit/hyperactivity disorder. *Child and Adolescent Psychiatric Clinics of North America, 9*(3), 525–540.
- Polderman, T. J., Boomsma, D. I., Bartels, M., Verhulst, F. C., & Huizink, A. C. (2010). A systematic review of prospective studies on attention problems and academic achievement. *Acta Psychiatrica Scandinavica, 122*(4), 271–284.
- Power, T. J., Costigan, T. E., Eiraldi, R. B., & Leff, S. S. (2004). Variations in anxiety and depression as a function of ADHD subtypes defined by DSM-IV: Do subtype differences exist or not? *Journal of Abnormal Child Psychology, 32*(1), 27–37.
- Renz, K., Lorch, E. P., Milich, R., Lemberger, C., Bodner, A., & Welsh, R. (2003). On-line story representation in boys with attention deficit hyperactivity disorder. *Journal of Abnormal Child Psychology, 31*(1), 93–104.
- Rutter, M., Tizard, J., & Whitmore, K. (1970). *Education, health and behaviour*. Longman Publishing Group.
- Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology, 52*(1), 141–166.
- Ryff, C. D. (2014). Psychological well-being revisited: Advances in science and practice. *Psychotherapy and Psychosomatics, 83*(1), 10–28.
- Seginer, R. (2009). *Future orientation: developmental and ecological perspectives*. New York: Springer.
- Sergeant, J. (2000). The cognitive-energetic model: an empirical approach to attention-deficit hyperactivity disorder. *Neuroscience & Biobehavioral Reviews, 24*(1), 7–12.
- Sergeant, J. A. (2005). Modeling attention-deficit/hyperactivity disorder: a critical appraisal of the cognitive-energetic model. *Biological Psychiatry, 57*(11), 1248–1255.
- Sher-Censor, E., & Oppenheim, D. (2004). Coherence and Representations in Preschoolers' Narratives: Associations With Attachment in Infancy. In M. W. Pratt & B. H. Fiese (Eds.), *Family stories and the life course* (pp. 77–108). Mahwah, NJ: Erlbaum.
- Simon, V., Czobor, P., Balint, S., Meszaros, A., & Bitter, I. (2009). Prevalence and correlates of adult attention-deficit hyperactivity disorder: meta-analysis. *The British Journal of Psychiatry, 194*(3), 204–211.
- Singh, I. (2008). Beyond polemics: science and ethics of ADHD. *Nature Reviews Neuroscience, 9*(12), 957–964.
- Sonuga-Barke, E. J. (2002). Psychological heterogeneity in AD/HD—a dual pathway model of behaviour and cognition. *Behavioural Brain Research, 130*(1), 29–36.
- Sonuga-Barke, E. J. (2003). The dual pathway model of AD/HD: an elaboration of neuro-developmental characteristics. *Neuroscience & Biobehavioral Reviews, 27*(7), 593–604.
- Sonuga-Barke, E. J. (2005). Causal models of attention-deficit/hyperactivity disorder: from common simple deficits to multiple developmental pathways. *Biological Psychiatry, 57*(11), 1231–1238.

- Sonuga-Barke, E. J., Dalen, L., Daley, D., & Remington, B. (2002). Are planning, working memory, and inhibition associated with individual differences in pre-school ADHD symptoms? *Developmental Neuropsychology*, *21*(3), 255–272.
- Sonuga-Barke, E. J., Dalen, L., & Remington, B. (2003). Do executive deficits and delay aversion make independent contributions to preschool attention-deficit/hyperactivity disorder symptoms? *Journal of the American Academy of Child & Adolescent Psychiatry*, *42*(11), 1335–1342.
- Sonuga-Barke, E. J., & Halperin, J. M. (2010). Developmental phenotypes and causal pathways in attention deficit/hyperactivity disorder: potential targets for early intervention? *Journal of Child Psychology and Psychiatry*, *51*(4), 368–389.
- Sonuga-Barke, E. J., Sergeant, J. A., Nigg, J., & Willcutt, E. (2008). Executive dysfunction and delay aversion in attention deficit hyperactivity disorder: nosologic and diagnostic implications. *Child and Adolescent Psychiatric Clinics of North America*, *17*(2), 367–384.
- Sroufe, L. A., Carlson, E. A., Levy, A. K., & Egeland, B. (1999). Implications of attachment theory for developmental psychopathology. *Development and Psychopathology*, *11*(1), 1–13.
- Stephens, H. F., Kistner, J. A., & Lynch, R. J. (2014). The calculation of discrepancy scores in the context of biased self-perceptions of acceptance. *Journal of Psychopathology and Behavioral Assessment*, 1–12.
- Stevenson, A. (Ed.). (2010). performance. *Oxford Dictionary of English*. Oxford University Press. Retrieved from http://www.oxfordreference.com/view/10.1093/acref/9780199571123.001.0001/m_en_gb0619520
- Stevens, S. E., Sonuga-Barke, E. J., Kreppner, J. M., Beckett, C., Castle, J., Colvert, E., ... Rutter, M. (2008). Inattention/overactivity following early severe institutional deprivation: presentation and associations in early adolescence. *Journal of Abnormal Child Psychology*, *36*(3), 385–398.
- Stringer, R. W., & Heath, N. (2008). Academic self-perception and its relationship to academic performance. *Canadian Journal of Education*, *31*(2), 327–345.
- SOU 2002: 120. *Åtta vägar till kunskap – en ny struktur för gymnasieskolan*. Stockholm: Offentliga publikationer.
- Takeda, T., Ambrosini, P. J., deBerardinis, R., & Elia, J. (2012). What can ADHD without comorbidity teach us about comorbidity?. *Research in Developmental Disabilities*, *33*(2), 419–425.
- Tannock, R., Purvis, K. L., & Schachar, R. J. (1993). Narrative abilities in children with attention deficit hyperactivity disorder and normal peers. *Journal of Abnormal Child Psychology*, *21*(1), 103–117.
- Target, M., Fonagy, P., & Shmueli-Goetz, Y. (2003). Attachment representations in school-age children: the development of the child attachment interview (CAI). *Journal of Child Psychotherapy*, *29*(2), 171–186.
- Tarver, J., Daley, D., & Sayal, K. (2014). Attention-deficit hyperactivity disorder (ADHD): an updated review of the essential facts. *Child: Care, Health and Development*, *40*(6), 762–774.
- Taylor, E. (2011). Antecedents of ADHD: a historical account of diagnostic concepts. *ADHD Attention Deficit and Hyperactivity Disorders*, *3*(2), 69–75.
- Taylor, S., & Brown, J. D. (1994). Positive illusions and well-being revisited: Separating fact from fiction. *Psychological Bulletin*, *116*(1), 21–27.
- Thapar, A., Cooper, M., Eyre, O., & Langley, K. (2013). Practitioner review: what have we learnt about the causes of ADHD? *Journal of Child Psychology and Psychiatry*, *54*(1), 3–16.

- Thorell, L. B., Rydell, A.-M., & Bohlin, G. (2012). Parent–child attachment and executive functioning in relation to ADHD symptoms in middle childhood. *Attachment & Human Development, 14*(5), 517–532.
- Thorell, L. B., & Wåhlstedt, C. (2006). Executive functioning deficits in relation to symptoms of ADHD and/or ODD in preschool children. *Infant and Child Development, 15*(5), 503–518.
- Towse, J. N., Hitch, G. J., & Hutton, U. (1998). A reevaluation of working memory capacity in children. *Journal of Memory and Language, 39*, 195–217.
- Tremplala, J., & Malmberg, L. E. (Eds.). (2002). *Adolescents' future-orientation: theory and research*. Frankfurt am Main: Lang.
- van der Kolk, A., van Agthoven, M., Buitelaar, J. K., & Hakkaart-van Roijen, L. (2015). A systematic review of literatures on factors associated with educational and academic performance in Attention Deficit Hyperactivity Disorder. *Creative Education, 6*(02), 164–180.
- van der Meere, J. (2005). State regulation and attention deficit hyperactivity disorder. In *Attention Deficit Hyperactivity Disorder* (pp. 413–433). Springer. Retrieved from <http://link.springer.com/chapter/10.1385/1-59259-891-9:413>
- van Ijzendoorn, M. H., Schuengel, C., & Bakermans-Kranenburg, M. J. (1999). Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology, 11*(02), 225–250.
- Von Klitzing, K., Kelsay, K., Emde, R. N., Robinson, J. A., & Schmitz, S. (2000). Gender-specific characteristics of 5-year-olds' play narratives and associations with behavior ratings. *Journal of the American Academy of Child & Adolescent Psychiatry, 39*(8), 1017–1023.
- Waller, N. G., Yonce, L. J., Grove, W. M., Faust, D., & Lenzenweger, M. F., (2013). *A Paul Meehl reader: Essays on the practice of scientific psychology*. https://nls.ldls.org.uk/welcome.html?ark:/81055/vdc_100025665485.0x000001.
- Warren, S. L., Oppenheim, D., & Emde, R. N. (1996). Can emotions and themes in children's play predict behavior problems? *Journal of the American Academy of Child & Adolescent Psychiatry, 35*(10), 1331–1337.
- Weschler, D. (2003). *Wechsler Intelligence Scale for Children—Fourth Edition* (4th ed.). San Antonio, TX: Psychological Corporation.
- Willcutt, E. G. (2012). The prevalence of DSM-IV attention-deficit/hyperactivity disorder: a meta-analytic review. *Neurotherapeutics, 9*(3), 490–499.
- Willcutt, E. G., Doyle, A. E., Nigg, J. T., Faraone, S. V., & Pennington, B. F. (2005). Validity of the executive function theory of attention-deficit/hyperactivity disorder: A meta-analytic review. *Biological Psychiatry, 57*(11), 1336–1346.
- Willcutt, E. G., Nigg, J. T., Pennington, B. F., Solanto, M. V., Rohde, L. A., Tannock, R., ... Lahey, B. B. (2012). Validity of DSM-IV attention deficit/hyperactivity disorder symptom dimensions and subtypes. *Journal of Abnormal Psychology, 121*(4), 991–1010.
- Youngstrom, E. A., Findling, R. L., & Calabrese, J. R. (2003). Who are the comorbid adolescents? Agreement between psychiatric diagnosis, youth, parent, and teacher report. *Journal of Abnormal Child Psychology, 31*(3), 231–245.
- Zahn-Waxler, C., Cole, P. M., Richardson, D. T., & Friedman, R. J. (1994). Social problem solving in disruptive preschool children: Reactions to hypothetical situations of conflict and distress. *Merrill-Palmer Quarterly, 40*(1), 98–119.
- Zanobini, M., & Usai, M. C. (2002). Domain-specific self-concept and achievement motivation in the transition from primary to low middle school. *Educational Psychology, 22*(2), 203–217.

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