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The Reciprocal Relationship Among Object Relations, Attention, and Language in a Sample of School-Aged Children

Katherine Ann Eiges

Graduate Center, City University of New York

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THE RECIPROCAL RELATIONSHIP AMONG OBJECT RELATIONS, ATTENTION, AND LANGUAGE IN A SAMPLE OF SCHOOL-AGED CHILDREN

BY KATHERINE A. EIGES

A dissertation submitted to the Graduate Faculty in Clinical Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy,
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Lissa Weinstein, Ph.D.

Date
Chair of Examining Committee

Joshua Brumberg, Ph.D.

Date
Executive Officer

Steven B. Tuber, Ph.D.
Hilary Gomes, Ph.D.
Benjamin H. Harris, Ph.D.
Jeffrey Rosen, Ph.D.

Supervisory Committee

THE CITY UNIVERSITY OF NEW YORK
Abstract

THE RECIPROCAL RELATIONSHIP AMONG OBJECT RELATIONS, ATTENTION, AND LANGUAGE IN A SAMPLE OF SCHOOL-AGED CHILDREN

by

Katherine A. Eiges

Advisor: Lissa Weinstein, Ph.D.

Background: Object relations (OR) disturbances are implicated in a broad range of socio-emotional problems and psychopathology in childhood, which are also common among children diagnosed with attention and language impairments. Though attachment-based factors are shown to play a role in the socio-emotional adjustment of children with learning disabilities, the specific influences of attention and language deficits on OR development is unknown. The present study aims to investigate the reciprocal influences of attention and language functioning on OR development. An empirically established OR measure for the Rorschach was systematically adapted to the Thematic Apperception Test (TAT) and examined for convergent validity to investigate potential differences in OR quality across the two projective instruments. Methods: 47 participants culled from a previously existing data set of children identified as at-risk for ADHD and SLI were assessed on measures of language, attention, and OR. The Rorschach Mutuality of Autonomy (MOA) scale (Urist, 1977; Urist & Shill, 1982) and adapted version for the TAT (MOA-TAT) were used to assess OR. Pearson correlation analyses were used to examine the convergence between the MOA and MOA-TAT scales, as well as their relationship to attention and language functioning. Results: The findings from the study provide preliminary
support for the MOA-TAT scale as a reliable and valid measure of OR. Inter-rater agreement for the MOA-TAT was excellent (ICC = .86), and significant convergence was revealed between the two scales. The MOA-TAT, however, evidenced a more adaptive OR distribution and higher frequency of responses than the MOA scale. The relationship among attention, language, and OR were not statistically significant. However, correlational trends emerged for attention symptomatology. Findings pertaining to language were inconsistent with and disconfirmed the study hypotheses. **Conclusions:** Results from the study offer significant contributions to OR assessment research and implications for clinical assessment practices.
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**Introduction**

A substantial body of research shows that object relations (OR) disturbances are implicated in a broad range of socio-emotional problems and psychopathology in childhood (see review, Steven Tuber, 1992). Children with Attention Deficit Hyperactivity Disorder (ADHD) and Specific Language Impairment (SLI) are highly vulnerable to a host of psychological and interpersonal difficulties (Elbro, Dalby, & Maarbjerg, 2011; Marton, Abramoff, & Rosenzweig, 2005; Miranda, Soriano, Fernández, & Meliá, 2008; Nixon, 2001; Redmond, 2011). Research indicates that attachment-based factors play a role in the socio-emotional difficulties of children with learning disabilities (e.g., Al-Yagon, 2008; Al-Yagon, 2012; Al-Yagon & Mikulincer, 2004). However, the understanding of how specific neurocognitive weaknesses (i.e. attention and language deficits) influence object relational development remains obscure.

The aim of this study is to elucidate the reciprocal influences of attention and language on OR functioning by investigating OR quality among a sample of children considered as at-risk for ADHD and SLI. This study utilizes the Mutuality of Autonomy Scale (MOA; Urist, 1977; Urist & Shill, 1982) as the measure of OR, which was adapted to the TAT (MOA-TAT) to examine differences in OR quality between the Rorschach and TAT, particularly with respect to language functioning. Language impairment has been shown to interfere with social-cognitive processes on tasks with greater language demands (e.g., Boucher, Lewis, & Collis, 2000; Nancy J. Cohen, Barwick, Horodezky, Vallance, & Im, 1998; Miller, 2001), and may therefore affect OR narratives on the TAT. To date, no study has explored the intersection between specific neurocognitive vulnerabilities and OR. However, the significant strains on socio-emotional development may reflect underlying OR disturbances. Hence, a more detailed understanding of
the object relations of children with attention and language symptomatology is critical for the development of clinical intervention strategies.

A review of the literature is provided in Chapter One, which will discuss the research related to ADHD and SLI, followed by an overview of OR theory and assessment research. Chapter Two describes the current study’s methodology. Chapter Three provides an overview of the statistical analyses and results of the study, which are then discussed and considered within the context of the existing literature in Chapter Four. This final chapter also addresses clinical implications, methodological limitations, and recommendations for future research.

**Attention Deficit Hyperactivity Disorder**

Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder characterized by hyperactivity, impulsivity, and inattentiveness. Conservative prevalence estimates range between 3-7% (APA, 2000; Mash & Barkley, 2003; Rohde, 2008). However, rates as high as 7-21% have been reported in community-based samples (Bauermeister et al., 2007; R. Cohen et al., 2013; DuPaul et al., 1997; Wolraich, Hannah, Pinnock, Baumgaertel, & Brown, 1996). In addition to disrupting academic and social development, ADHD elevates the risk for a multitude of psychological problems that often persist into adulthood (Booster, DuPaul, Eiraldi, & Power, 2012; Lee, Lahey, Owens, & Hinshaw, 2008; Merwood & Asherson, 2011; T. J. Spencer, Biederman, & Mick, 2007; Wilens et al., 2011). Given its high prevalence and the psychological tumult it inflicts on children and their families, it is unsurprising that ADHD has captivated the attention of the scientific community. Yet, despite an expansive body of research and literature, much about the disorder remains elusive.
Diagnostic Classification

The DSM-5 (APA, 2013) distinguishes between two symptom domains of ADHD: inattentiveness\(^1\) and hyperactivity-impulsivity\(^2\). A minimum of six symptoms\(^3\) from either or both domains must be present for at least six months in order to meet diagnostic criteria. Symptoms must also be observed before the age of 12\(^4\), manifest in at least two settings (e.g. home, school or work, with friends or family members, or in other activities), and result in significant impairment in social, academic, or occupational functioning\(^5\).

With 504 possible symptom combinations, the heterogeneity of ADHD poses a major challenge to researchers and clinicians alike (Tripp & Wickens, 2009). To increase diagnostic precision, the DSM-5 distinguishes between four specific subtypes: Predominantly Inattentive (ADHD-I), Inattentive\(^6\) Only (ADHD-IO), Hyperactive/Impulsive (ADHD-HI), and Combined Type (ADHD-C). Considerable subtype differences exist with respect to the age of onset and gender prevalence (APA, 2000; Martel, Roberts, Gremillion, von Eye, & Nigg, 2011). The age of onset tends to be earlier for ADHD-HI than ADHD-C, and significantly later for ADHD-I (Voeller, 2004). Gender disparities are also notable, with male to female ratios ranging between 2:1 to 9:1 in clinical samples, and 2:1 to 3:1 in epidemiological studies (APA, 2000; Carlson, Tamm, & Gaub, 1997; Nussbaum, 2012; Voeller, 2004). In addition, females are far more likely to be classified as ADHD-I, and less likely to be referred for treatment because their behavior is less disruptive than boys (Gaub & Carlson, 1997b; Nussbaum, 2012).

\(^1\) Examples of inattentive symptoms include: poor attention to details, difficulty sustaining attention, easily distracted, forgetful, and organization problems.
\(^2\) Examples of hyperactivity and impulsivity include: fidgety, difficulty sitting still, talks excessively, and interrupts or intrudes on others.
\(^3\) According to new DSM-5 guidelines, older adolescents and adults must present with at least five symptoms from either or both symptom clusters.
\(^4\) In the DSM-IV symptoms had to be present before the age of seven in order to receive an ADHD diagnosis.
\(^5\) The symptoms also must not be better accounted for by another psychological disorder.
\(^6\) The Inattentive-only presentation is new to the DSM-5. The diagnosis is given if a minimum of six inattention symptoms are present, with a maximum of two hyperactive/impulsive symptoms.
The ADHD subtypes are also linked to different comorbid psychiatric problems and cognitive profiles. Children with predominantly inattentive presentations are at greater risk for academic and language problems, whereas children with combined- and hyperactive-impulsive subtypes are more prone to executive function difficulties (Klorman et al., 1999; Semrud-Clikeman, Walkowiak, Wilkinson, & Butcher, 2010; Tirosh & Cohen, 1998; Weiss, Worling, & Wasdell, 2003). A similar pattern emerges within psychosocial domains, with internalizing disorders and social withdrawal more common to ADHD-I, and externalizing problems and social rejection more common to ADHD-C and –HI (APA, 2000; Gadow et al., 2004; Milich, Balentine, & Lynam, 2001; Solanto, Pope-Boyd, Tryon, & Stepak, 2009).

Because the characteristics of ADHD-I deviate markedly from other subtypes, some experts advocate for its classification as a separate disorder (Milich et al., 2001). However, longitudinal data suggests that while the general ADHD diagnosis tends to remain stable, considerable shifting can occur across subtype classification, thus reflecting greater overlap than the disparate symptoms profiles suggest (B. B. Lahey, Pelham, Loney, Lee, & Willcutt, 2005).

**Comorbidity**

Further complicating the diagnostic picture is the high prevalence of neuropsychiatric comorbidity. It is estimated that up to 50%-90% of children with ADHD carry another psychiatric disorder (T. Spencer, Biederman, & Wilens, 1999; Wilens et al., 2002). The most common co-occurring conditions are: Oppositional Defiant Disorder (35-60% of cases), Conduct Disorder (30-50% of cases), Anxiety and Mood Disorders (20-40% of cases), and Tourette’s Syndrome (Adler, Barkley, Wilens, & Ginsberg, 2006; Biederman, Newcorn, & Sprich, 1991; Gau et al., 2010; T. J. Spencer et al., 2007).
Learning disabilities (LDs) also frequently co-occur (DuPaul, Gormley, & Laracy, 2013; DuPaul & Stoner, 2003; Voeller, 2004). A recent review of the ADHD-LD literature published between 2001 and 2011 reports a comorbidity rate of 31%-45% DuPaul et al. (2013). The high concomitance rates of reading and math disabilities have long been recognized (Sexton, Gelhorn, Bell, & Classi, 2012; Voeller, 2004). Speech/language pathology and written expression disorder have received increased attention in recent years (Adi-Japha et al., 2007; Bruce, Thernlund, & Nettelbladt, 2006; Geurts & Embrechts, 2008; Mayes & Calhoun, 2006; McGrath et al., 2008; Mueller & Tomblin, 2012; Sundheim & Voeller, 2004; Tirosh & Cohen, 1998; Yoshimasu et al., 2011). Developmental disabilities, including autistic spectrum, pervasive developmental, and nonverbal learning disorders also frequently co-occur with ADHD (Mayes, Calhoun, Mayes, & Molitoris, 2012; Semrud-Clikeman, 2010).

**Etiology**

The etiology of ADHD is multi-determined and complex. Evidence supports a strong genetic contribution (Biederman, Faraone, Keenan, & Benjamin, 1992; Faraone et al., 2001), with heritability estimates ranging from 75% for monozygotic twins and 30%-35% for dizygotic twins (Kieling, Goncalves, Tannock, & Castellanos, 2008; Nikolas & Burt, 2010). Nevertheless, significantly lower concordant rates among monozygotic twins reared apart also demonstrates the substantial influence of environmental factors (Larsson, Anckarsater, Råstam, Chang, & Lichtenstein, 2012; Nikolas & Burt, 2010). Accordingly, a biopsychosocial perspective that emphasizes the interaction between genetic and environmental forces is most useful for capturing the vast complexity of this disorder.

---

7 Nonverbal learning disability is no longer a DSM diagnosis; however, the disorder shares many similarities with autism and pervasive development disorder.
Neuroimaging studies reveal several anatomical differences associated with ADHD. Volumetric reductions in specific brain regions have been identified (Tripp & Wickens, 2009; Valera, Faraone, Murray, & Seidman, 2007). There is also evidence of maturational delays in cortical development, especially within the prefrontal region, an area responsible for cognitive-control processes like attention and motor planning (P. Shaw et al., 2007). Similarly, fMRI studies reveal reduced brain activation in the prefrontal and striatal regions, which accounts for associated impairments in attention, cognitive, affective, and motivational control functions (Casey et al., 2007; Cubillo, Halari, Smith, Taylor, & Rubia, 2012). Dysfunction in the dopaminergic system, which plays a critical role in motor, motivational, and reward processes, is also implicated in ADHD (Vaidya & Gordon, 2013; Wu, Xiao, Sun, Zou, & Zhu, 2012).

Neuropsychological Correlates

Studies investigating neuropsychological correlates of ADHD consistently demonstrate weaknesses in the executive function (EF) system, which is responsible for higher-order processes that help regulate, manage, and control other areas of cognition. EF domains of attention, planning, working memory, strategizing, and self-regulation are often compromised in ADHD. A meta-analytic review revealed that children with ADHD performed significantly poorer across an entire series of EF tasks than non-ADHD children (Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005). The strongest, most consistent effects appeared on measures of working memory, response inhibition, vigilance, and planning. Parallel findings emerged in a recent study examining EF domains in a sample of 498 youths classified as ADHD-I, ADHD-C, and non-ADHD (Nikolas & Nigg, 2013). Both ADHD groups performed significantly worse

8 Recent studies investigating the working memory deficits in ADHD children show large effect sizes for both visual- and phonological-working memory (Kasper, Alderson, & Hudec, 2012; Martinussen, Hayden, Hogg-Johnson, & Tannock, 2005; Sowerby, Seal, & Tripp, 2011).
9 These findings were unrelated to intelligence, academic achievement, or symptoms of other disorders.
than the non-ADHD group on measures of cognitive control\textsuperscript{10}. However, the ADHD-C group demonstrated significantly greater impairment than the ADHD-I group. Moreover, inhibition, arousal, response variability, and higher-cognitive control predicted a diagnosis of ADHD-C, but not ADHD-I, which was solely predicted by processing speed. Thus, while pronounced EF deficits are evident, they are only part of the complex neuropsychological profile of ADHD.

**Developmental Perspectives**

A developmental psychopathology model attempts to integrate endogenous and exogenous factors in understanding the onset and course of a given disorder. The extent to which disorders are determined by genetic versus environmental contributions varies by the individual. For some, genetic and biological risk factors prevail over environmental circumstances, whereas for others, symptoms of the disorder emerge in response to adverse circumstances despite minimal biological vulnerability. Etiological considerations can be useful for anticipating the prognosis of the disorder. For instance, in a large-scale psychoanalytic treatment study of 500 ADHD children, Leuzinger-Bohleber et al. (2011) classified subgroups of ADHD based on biological and environmental risk factors (e.g. organic brain problems, early emotional neglect, trauma, culture, extraordinarily talented, mourning or depression, and early loss of a mother) to demonstrate how idiosyncratic psychic and psychosocial etiological factors differentially influence the symptomatic presentation of the disorder and its response to treatment. Nevertheless, whether more strongly influenced by nature or nurture, both forces exert interactive effects on the trajectory of the disorder.

The reciprocal influence of biological and environmental factors is nicely represented in Ruff and Rothbart’s (1996) developmental model of attention. Though infants enter the world

\textsuperscript{10} Inhibition, working memory, memory span, processing speed, arousal, response variability, and temporal information processing were examined as areas of cognitive control in this study.
with varying readiness to attend, remain attentive, and focus and concentrate on objects, events, and activities, the attention system develops within a social context. The primary caregiving relationship is the initial social context through which the infant’s early dependence on external control for attention regulation fosters the development of an internal control system (Luria, 1979; Ruff & Rothbart, 1996). Joint attention, which refers to the capacity to coordinate attention with a social partner (Mundy & Newell, 2007), facilitates the process of learning both how and to what to attend, and is essential for general learning, language development, and social competence.

Three general systems of attention develop during the first five years of life: selectivity, state of engagement, and higher-level control11 (Ruff & Rothbart, 1996). Selectivity and state of engagement are part of the orienting and investigative system, which develops during the first year of life and is primarily driven by novelty. The system of higher level controls emerges towards the end of the first year and, in conjunction with language development, facilitates the maturing capacity for response inhibition between age three and four (Russell A. Barkley, 1997). Language plays an essential role in response inhibition because the internalization of speech (i.e. self-speech) aids in tasks involving motivation, task persistence, multi-step directions, and motoric responses. As such, the capacity to voluntarily direct attention and inhibit responses is well underway by age four.

---

11 Halperin (1994) and Mirsky (1996) describe additional elements of attention that are important to consider. Halperin summarizes four components: (1) arousal, which physiologically prepares the body for stimulus perception; (2) the orienting response, which is involved in directing attention towards stimuli; (3) selective attention, which entails focusing on relevant stimuli while ignoring irrelevant information; and (4) sustained attention, which involves the ability to maintain focus on a particular stimulus for an extended period of time. Mirsky distinguishes between five different elements: (1) focus/execute: the ability to identify and successfully focus on a specific stimulus; (2) shift: the ability to switch focused attention from one stimulus to the next; (3) sustain: the ability to maintain focus on a given stimulus; (4) encode: the ability to utilize the information attended to in working memory; (5) stability: the relative level of attentional effort over time.
This model of typical attention development dovetails nicely with Gilmore’s (2000, 2002) conceptualization of ADHD. Informed by an ego-psychology perspective, Gilmore posits that the capacity to attend is contingent upon the organization and integration of ego capacities, which marks a developmental achievement, and serves as a foundation for the development of attention resources. Accordingly, ADHD symptoms reflect vulnerabilities in ego functioning, which is responsible for the synthesis, organization, and integration of experiences. Because ego functioning impairments are inextricably tied to weaknesses in attention, affect regulation, and disturbances in object representations, they become interwoven into development and dynamics, both intrapsychic and familial, in such a way that generates a highly complex, individualized presentation of the disorder.

The processes through which ego function deficits contribute to OR disturbances are further detailed by Jones (2011), who posits that reality-sampling deficits, “a disturbance at the interface of internal and external reality and in the transition between primary and secondary processes,” interfere with proper cathexis to objects. Jones (2011) explains: “For the child with ADHD and an incumbent reality-sampling deficit, the world would be populated by objects that insufficiently gratify his instinct derivatives, which would flood forward with greater force under the guiding dominance of the pleasure principle.” As such, the child is prone to experiences of excessive overstimulation that can be reduced through motor discharge (e.g. hyperactivity), but generally result in difficulties achieving drive gratification from any single object. Consequently, the ADHD child flits from one object to the next to accumulate the gratification they seek.

**Family and Parenting Factors**

Studies consistently report more stressful and conflicted family environments in community and clinic-referred samples of ADHD children (Biederman et al., 1999; Deault,
2010; DuPaul, McGoey, Eckert, & VanBrakle, 2001; Graziano, McNamara, Geffken, & Reid, 2011; Kaiser, McBurnett, & Pfiffner, 2011). Self-report and observation studies reveal that parents of ADHD children exhibit more power assertive and controlling behavior (Buhrmester, Camparo, Christensen, Gonzalez, & Hinshaw, 1992; Cunningham & Barkley, 1979; Gerdes, Hoza, & Pelham, 2003); less positive and warm parenting (Gerdes et al., 2003; C. Johnston & Mash, 2001); and are more emotionally over-involved and critical towards their children than parents of children without ADHD (C. Johnston, Murray, Hinshaw, Pelham, & Hoza, 2002; Peris & Hinshaw, 2003).

Parenting behaviors are shown to influence the socio-emotional functioning of ADHD children. Positive parenting factors, particularly warmth, are positively associated with peer acceptance and social skills, and negatively associated with peer rejection and aggressive behavior (Hinshaw, Zupan, Simmel, Nigg, & Melnick, 1997; Hurt, Hoza, & Pelham, 2007; Keown & Woodward, 2006). In contrast, ineffective parenting behaviors, such as power assertive, punitive, and inconsistent discipline practices, predict increased physical aggression, peer rejection, and poorer social skills (Hurt et al., 2007). Kaiser et al. (2011) showed that positive and negative parenting practices mediate the relationship between ADHD and the child’s social skills and aggression, but with differential effects for mothers and fathers. Whereas maternal parenting was positively related to both social skills and aggression, for fathers, positive parenting correlated with social adeptness, and negative parenting with aggression. Moreover, ADHD severity predicted increased levels of negative parenting which, in turn, exerted negative effects on the child’s psychosocial functioning. Therefore, the parents’ ability to cope with the added challenges of managing their child’s ADHD symptoms influences the extent to which a pernicious cycle ensues between the disorder and caregiving environment.
For this reason, parental psychopathology, which impedes effective coping, has been shown to exacerbate children’s symptomatic presentation of the ADHD. For example, in two studies, parental anxiety predicted ineffective parenting practices (e.g. overprotectiveness, lack of warmth), as well as adverse outcomes, such as comorbid Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD; Kashdan et al., 2004; Pfiffner & McBurnett, 2006). Research also shows that parents of ADHD children with comorbid ODD or CD are more likely to have some form of psychopathology (Chronis et al., 2007; Kashdan et al., 2004; D. S. Shaw, Owens, Giovannelli, & Winslow, 2001). In a study by Chronis et al. (2003), mothers of ADHD children with comorbid ODD and CD were more likely to have mood, anxiety, and substance abuse disorders, and to report a history of ADHD and disruptive behavior during childhood. Similarly, Harris, Boots, Talbot, and Vance (2006) found that mothers of ADHD children with dysthymic disorder reported higher rates of anxiety and depression than mothers of ADHD-only children.

Parental attachment status is also shown to influence the prognostic course of ADHD. An exploratory study of the attachment representations of mothers revealed that, while mothers of non-ADHD children evidenced the highest percentage of secure attachment (84.2%), the percentage of secure attachment among mothers of ADHD children without the need for clinical treatment (57.9%) was much higher than mothers of ADHD children in treatment (15.4%). Notably, the highest proportion of preoccupied, insecure, and unresolved attachment classifications was identified among mothers of ADHD children in treatment. In a similar vein, children’s attachment security has also been shown to influence ADHD symptomatology. Research by Thorell, Rydell, and Bohlin (2012) revealed that attachment status at age 8.5 predicted ADHD symptom severity a year later. Moreover, attachment disorganization and
executive functioning were independently related to ADHD symptoms\textsuperscript{12}, suggesting that attachment disorganization singularly exacerbates ADHD symptomatology. As such, secure attachment buffers against adverse outcomes while insecure attachment increases the risk.

These findings support an object relations view of ADHD in which disturbances in early parent-child relationships contribute to the presentation of the disorder (Conway, 2012; Leuzinger-Bohleber et al., 2011; Szymanski, Sapanski, & Conway, 2011). Indeed, evidence suggests that adverse and traumatic caregiving environments elevate the risk of ADHD. Research shows that approximately one-third of severely maltreated children meet criteria for ADHD (Famularo, Fenton, Kinscherff, & Augustyn, 1996); children diagnosed with ADHD and ODD are far more likely to report past trauma exposure (J. D. Ford et al., 2000); and children of traumatized parents are at higher risk for PTSD and ADHD (Daud & Rydelius, 2009). Therefore, socio-emotional difficulties are far more likely to ensue when caregivers are psychologically unequipped to contend with the added demands of raising an ADHD child.

**Socio-Emotional Functioning**

The social and emotional ramifications of ADHD are immense. Children with ADHD are significantly more likely to exhibit difficulties in peer- and familial-relationships (Russell A. Barkley, 2003). Consistent evidence shows that, compared to non-ADHD samples, children with ADHD are more frequently off-task, disruptive, defiant, and out of control in classroom situations (Carroll et al., 2006); rated as less socially competent by parents, teachers, and peers (DuPaul et al., 2004; Gaub & Carlson, 1997a; McConaughy, Volpe, Antshel, Gordon, & Eiraldi, 2011); viewed as less popular by peers (Flicek, 1992; Gaub & Carlson, 1997a; Hodgens, Cole, & Boldizar, 2000); they are more prone to social rejection and neglect (Hinshaw et al., 1997; Hoza et al., 2005); and have difficulty establishing and maintaining friendships (Blachman &

\textsuperscript{12} These findings remained significant, even when using conduct problems as a covariate.
Hinshaw, 2002). They also exhibit more intense levels of aggressive verbal and physical behaviors, with or without provocation from others, and are more likely to be victims and perpetrators of bullying (Abikoff et al., 2002; Maedgen & Carlson, 2000; Unnever & Cornell, 2003; Waschbusch et al., 2002; Zalecki & Hinshaw, 2004). The range and severity of social dysfunction is even more extreme among ADHD children with comorbid psychiatric problems (Abikoff et al., 2002; Booster et al., 2012; Lee, Falk, & Aguirre, 2012; Nijmeijer et al., 2008).

The extent of interpersonal difficulties cannot be fully accounted for by mere social skills deficits. They involve underlying impairments in social information processing (Matthys, Cuperus, & Van Engeland, 1999), executive functioning (Abad, Alilou, Tapeh, & Rostami, 2011), and affect dysregulation (Anastopoulos et al., 2011). A number of studies indicate that ADHD children exhibit greater difficulties processing emotional and nonverbal cues on social perception tasks than normal-controls (Fine, Semrud-Clikeman, Butcher, & Walkowiak, 2008; Norvilitis, Casey, Brooklier, & Bonello, 2000; Semrud-Clikeman, 2010; Semrud-Clikeman, Walkowiak, Wilkinson, & Minne, 2010; Uekermann et al., 2010). Some evidence suggests specific emotional processing deficits interfere with the ability to use contextual information to infer the emotional states of others (Da Fonseca, Seguier, Santos, Poinso, & Deruelle, 2009).

Several authors contend that social processing impairments are more related to inattentiveness, whereas hyperactivity and impulsivity are more linked to response inhibition and affect regulation difficulties that engender a different set of social consequences (Uekermann et al., 2010). For example, Semrud-Clikeman (2010) showed that inattention, but not hyperactivity-impulsivity symptoms, predicted poorer social perception. In contrast, children with pronounced hyperactivity and impulsivity exhibited more impaired behavioral inhibition, executive function, and emotion regulation relative to children with inattention only (Abad et al., 2011;
Anastopoulos et al., 2011; Crundwell, 2005). Emotion dysregulation, in particular, is shown to predict socio-emotional maladjustment. In comparing 358 children with and without ADHD, Anastopoulos et al. (2011) revealed that ADHD status predicted emotional lability, and 50% of ADHD children displayed elevated lability, as compared to only 15% of non-ADHD children. Additionally, emotional lability not only correlated with social impairment, poorer adaptive functioning, and comorbid emotional and behavioral problems, but was also identified as a partial mediator between ADHD status and adverse outcomes. Similarly, research investigating the longitudinal course of deficient emotional regulation in ADHD showed that 57% of those exhibiting poor regulation at baseline continued to evidence such difficulties at follow-up, and were more likely to experience ongoing comorbid psychiatric conditions and impaired social functioning than those with ADHD alone (Biederman et al., 2012).

Though affect dysregulation appears to be more prominent among hyperactive-impulsive and combined subtypes, research indicates that it is inherent to the disorder at large. Observational and self-report studies reveal that, in comparison to non-ADHD samples, children with a general ADHD diagnosis evidence more significant emotion-regulation deficits. In a study by S. A. Jensen and Rosén (2004), mothers of ADHD children rated their children as more emotionally reactive than mothers of non-ADHD children. Similarly, Walcott and Landau (2004) demonstrated that, in response to a frustrating task, ADHD boys displayed more disinhibition and less effective emotion regulation strategies, including increased negative responses, immobilized behavior, and an inability to conceal emotional responses when instructed. In another study of ADHD children’s responses to frustrating tasks, ADHD boys with comorbid aggression exhibited more maladaptive emotion regulation strategies, such as focusing on negative aspects of the task, engaging in less cognitive reframing, and displaying more intense
emotional expressions (e.g. fist slamming, sighing; Melnick & Hinshaw, 2000). These variables were also shown to predict overall noncompliance and less social acceptance in a naturalistic summer camp setting.

The connection between poor emotion regulation and social difficulties makes sense in light of research documenting impaired theory of mind and reduced empathy in ADHD children (Braaten & Rosén, 2000; Uekermann et al., 2010). For example, Braaten and Rosén (2000) found that ADHD boys exhibited fewer empathic responses and more limited emotional self-control (e.g. more outward signs of sadness, anger, and guilt) on an empathic reasoning task than non-ADHD boys. Further, an interaction emerged between stories with positive versus negative valence, such that their performance was significantly more impaired when stories evoked negative affect. Thus, affect dysregulation appears to stifle the capacity for empathy, which represents a vital aspect of social functioning.

Two important studies further elucidate the processes through which emotional dysregulation contributes to social impairment (Musser et al., 2011; Musser, Galloway-Long, Frick, & Nigg, 2013). In examining parasympathetic (i.e. emotion dysregulation) and sympathetic activity (i.e. arousal) in response to emotionally-laden film clips of social scenes, Musser et al. (2011) showed that non-ADHD children displayed systematic variation in parasympathetic activity across four conditions in which positive or negative emotions were either induced or suppressed. In contrast, ADHD children exhibited elevated parasympathetic activity across study conditions, suggesting greater susceptibility to becoming dysregulated by the emotional states of others. Abnormal parasympathetic mechanisms were also identified in a follow-up study revealing distinct patterns of autonomic functioning among ADHD children classified as exhibiting high- versus low-pro-social behavior (Musser et al., 2013). In contrast to pro-social
ADHD children, who displayed atypically elevated parasympathetic reactivity (i.e. emotion dysregulation) when positive emotions were induced, along with increased sympathetic activity (i.e. arousal) across conditions, low pro-social ADHD children exhibited reduced sympathetic reactivity and parasympathetic activity across baseline and task conditions.

These findings allude to the role of defenses and object relations in social behavior. The higher sensitivity towards others’ emotional states evidenced by the pro-social children may reflect more sophisticated defenses and healthier object relations, which allows them to consider others’ experiences in such a way that facilitates positive engagement. The dampened autonomic responses of the low-pro-social children, on the other hand, may represent an over-regulated, highly defended response to others’ emotional states. Primitive defenses (e.g. denial, projection, etc.) and negative object relations may thus be implicated here, for the heightened need to shield oneself suggests a more ominous view of others. In any event, this self-protective stance might tax the child’s psychological resources, precluding his or her capacity to take the others’ experience into account, thereby reducing the likelihood of pro-social engagement.

The connection between OR and affect dysregulation is further illustrated in a study by Meehan et al. (2008b), which utilized the Rorschach Inkblot Method (RIM) to examine self-regulation and the internal resources of ADHD children. Findings revealed that children with more severe ADHD symptomatology had more limited access to internal resources, as evidenced by fewer RIM variables that represent the capacity for emotional regulation and stress tolerance. In addition, children with more severe ADHD symptomatology produced fewer human movement responses, an indicator of the capacity for delay, interest in social exchange, and of the ability to access and make effective use of fantasy life. These findings are consistent with other RIM studies reporting fewer human movement responses, along with fewer indicators of regulatory
capacities and internal resources among ADHD children (Bartell & Solanto, 1995; Cotugno, 1995; Gordon & Oshman, 1981; Jain, Singh, Mohanty, & Kumar, 2005). Taken together, the existing research supports the current study’s hypothesis that ADHD symptomatology will be related to greater OR disturbances.

**Specific Language Impairment**

Specific Language Impairment (SLI) is a developmental language disorder characterized by difficulties in the acquisition and use of language that are not attributable to general cognitive delays, neurological problems, or physical disabilities (APA, 2013; D.V.M. Bishop, 1997; N.J. Cohen, 2001; Tomblin et al., 1997). It is estimated that 7-8% of children are affected by the disorder (La Paro, Justice, Skibbe, & Pianta, 2004; Tomblin et al., 1997), with a higher prevalence among males (8%) than females (6%; La Paro et al., 2004; Tomblin et al., 1997; Whitehurst & Fischel, 1994).

Children with SLI frequently encounter a range of psychosocial adversities, including academic difficulties (Conti-Ramsden, Durkin, Simkin, & Knox, 2009; Dockrell & Lindsay, 2007; Dockrell, Lindsay, & Palikara, 2011; Young et al., 2002); social problems (Hart, Fujiki, Brinton, & Hart, 2004; McCabe, 2005); behavioral and emotional disturbances (Joseph H. Beitchman et al., 1996; Lindsay, Dockrell, & Strand, 2007); and an elevated risk for psychiatric disorders (Joseph H. Beitchman, Wilson, et al., 2001; Wadman, Botting, Durkin, & Conti-Ramsden, 2011). Though some studies indicate that the effects on psychosocial adjustment persist into adulthood (Elbro et al., 2011; C. J. Johnson et al., 1999; Snowling, Bishop, Stothard, Chipchase, & Kaplan, 2006), research also shows considerable variability in the prognosis and trajectory of the disorder (Law, Boyle, Harris, Harkness, & Nye, 2000; Lindsay et al., 2007; St Clair, Pickles, Durkin, & Conti-Ramsden, 2011).
Diagnostic Classification

The diagnostic determination of SLI is complicated by obscure boundaries between normal and deviant communicative ability and the diverse set of classification procedures used by clinicians and researchers. The literature distinguishes between language delay, which refers to a slower progression of language development eventually expected to align with developmental standards, and language disorder, which is expected to steadily deviate from the norm in terms of its severity, course, and patterns of language functioning (N.J. Cohen, 2001, pp. 4-5). Despite the logic of this distinction, the enduring effects of language delays, even for children whose language issues appear to resolve early on, are reported by several researchers (Snowling, Bishop, & Stothard, 2000; Stothard, Snowling, Bishop, Chipchase, & Kaplan, 1998).

The diagnosis of SLI is typically determined by a combination of exclusionary and discrepancy-based criteria. Exclusionary conditions, such as hearing impairment, mental retardation, and significant emotional disturbance, are thought to distinguish “pure” forms of SLI from language deficits related to sensory and developmental disorders (Aram, Morris, & Hall, 1992; D.V.M. Bishop, 1997). The discrepancy-based system of classification relies on standardized assessments in order to evaluate the child’s attained language status against a particular set of norms. Though there is some disagreement over the most appropriate set of norms, such as the types of reference scores (developmental norms: age/grade equivalents or scores of relative standing: percentiles/standard scores), and reference groups (chronological-age vs. mental-age), the use of chronological age and standardized scores is generally regarded as common practice within the field (Aram, Morris, & Hall, 1993; Cole, Mills, & Kelley, 1994; M. Lahey, 1990; Tomblin, Records, & Zhang, 1996).
Considerable controversy regarding the magnitude of discrepancy for determining SLI also exists. Due to a dearth of empirical data to inform the appropriate disparity level, cutoff guidelines are relatively arbitrary. The majority of studies recommend cutoff values ranging from one to two standard deviations (SD) below the mean of particular cognitive domains (Nancy J. Cohen et al., 1998; R. Paul, 1995; Semel et al., 2003; Tomblin et al., 1996). However, the limits of discrepancy-based criteria are apparent for the identification of SLI among children at the extremely high- and low-ends of the intelligence spectrum. The greater latitude for variable cross-domain functioning that exists for superior intelligence renders SLI susceptible to over-identification in this population. In contrast, the more restricted range of cross-domain functioning in the more impaired range increases the likelihood for under-identification of SLI (N.J. Cohen, 2001).

The DSM-5 (APA, 2013) parameters for a Language Disorder diagnosis are also open-ended: “Language abilities are substantially and quantifiably below those expected for age, resulting in functional limitations in effective communication, social participation, and academic achievement or occupational performance.” It also specifies that the child must present with persistent difficulties in the acquisition and use of language across modalities (e.g. spoken, written, sign) due to receptive or expressive problems, as evidenced by limited vocabulary, poor sentence structure, and discourse impairments. The onset of symptoms must occur during an early developmental period and must not be better accounted for by hearing or sensory impairment, motor dysfunction, medical or neurological conditions, intellectual disability, or global developmental delay. Consequently, the diagnosis of SLI is largely left to the discretion of diagnosticians and researchers.
Language Profiles

SLI has historically been subcategorized into Expressive and Mixed Receptive-Expressive Language Disorder. However, the distinction between global versus specific expressive language impairments fails to capture the heterogeneous language profiles of SLI. Finer discriminations between the component skills of expressive and receptive language allow for a more nuanced conceptualization of the disorder, as well as each child’s unique strengths and weaknesses, which offers more utility for clinicians and remediation specialists (N.J. Cohen, 2001; Whitehurst & Fischel, 1994). As such, an overview of the components parts of language and their associated impairments will be provided.

*Phonology* refers to the systematic organization of sounds in languages that are combined in order to generate words conveying shared meanings. Phonological deficits manifest in difficulties with sound detection, discrimination, and combination, as well as the segmentation of words into its component sounds. Thus, mispronunciation of words, misunderstanding of sounds, and difficulty linking phonemes to orthographic representations\(^{13}\) (letters/words) are common. The *semantic* or *lexical* aspects of language involve vocabulary knowledge and the meaning of words in context. Children with semantic weaknesses present with a limited fund of vocabulary, word finding problems, and difficulties with figurative language. *Syntax* and *morphology* refers to the grammatical aspects of language, which provide rules for organizing sounds into words (morphology) and words into sentences (syntax).

Auditory processing, though not a component part of language, is fundamental to language development and is frequently compromised in SLI. The auditory processing system comprises *auditory verbal memory*, which allows for recall of utterances that hold verbal meaning, and *auditory processing*, which is responsible for analyzing sounds and deriving

\(^{13}\) The ability to link phonemes with orthographic representations is an important precursor for literacy skills.
meaning from verbal input. Deficits in auditory processing are shown to precede and predict language delays in infants (Benasich & Tallal, 2002; Choudhury, Leppanen, Leевers, & Benasich, 2007), and are often evident among individuals with SLI (Montgomery & Windsor, 2007; Vandewalle, Boets, Ghesquière, & Zink, 2012; Weinert, 1996).

The panoply of linguistic errors often result in general communication difficulties. Children with SLI often exhibit weaknesses in discourse, which requires proper use of linguistic devices and coherent, cohesive connections of sentences and integration of ideas. These are essential for carrying on conversations, expressing oneself, providing instructions, and describing thoughts and events. Narrative discourse, which refers to storytelling or retelling, draws on a similar skill set, but with the added demands of sequencing, cohesion, working memory, and perspective taking. The pragmatic aspects of language, which include conventional rules for communication, may also be compromised due to difficulties with integrating structural language, knowledge of social rules, social-cognitive skills, and executive functions. Verbal and nonverbal pragmatic competence requires moment-to-moment recognition of the listener’s needs, the demands of the conversation, and estimates of the listener’s knowledge and state of mind. Pragmatic language impairments have received growing recognition as a discrete construct (Freed, Lockton, & Adams, 2012; Ketelaars, Cuperus, Jansonius, & Verhoeven, 2010) and is included in the DSM-5 as its own distinct diagnostic entity (i.e. Pragmatic Language Disorder).

**Concomitant Neurocognitive Impairments**

Children with SLI frequently present with a range of attendant neurocognitive impairments that extend beyond language. The most common co-occurring deficits are observed in fine and gross motor coordination (Estil, Whiting, Sigmundsson, & Ingvaldsen, 2003; Hill, 2001; Mandelbaum et al., 2006; Rechtnikov & Maitra, 2009; Zelaznik & Goffman, 2010);
visual-motor integration (Nancy J. Cohen et al., 1998; Powell & Bishop, 1992); attention (Duinmeijer, de Jong, & Scheper, 2012; Ebert & Kohnert, 2011; Finneran, Francis, & Leonard, 2009; Spaulding, Plante, & Vance, 2008); executive functioning (Nancy J. Cohen et al., 1998; Nancy J. Cohen et al., 2000; Henry, Messer, & Nash, 2012a; Purvis & Tannock, 1997); auditory processing (Ors, Lindgren, Blennow, & Rosen, 2002; Uwer, Albrecht, & von Suchodoletz, 2002); and processing speed (Leonard, 2007; Miller, Kail, Leonard, & Tomblin, 2001; Windsor & Hwang, 1999). The breadth of associated neurocognitive deficits helps explain the elevated prevalence of reading and written expression disorders, which are higher-order academic skills (Hayiou-Thomas, Harlaar, Dale, & Plomin, 2010; Lewis et al., 2011; Snowling et al., 2000; Stoëckel et al., 2013).

Investigations into the memory system reveal sweeping impairments across multiple domains. Though general weaknesses in short-term and working memory are well-documented (Archibald & Gathercole, 2006; Freed et al., 2012; Montgomery, Magimairaj, & Finney, 2010), specific impairments in phonological working memory are strongly implicated in the disorder (D. V. M. Bishop, North, & Donlan, 1996; Gathercole & Baddeley, 1990; Henry, Messer, & Nash, 2012b). However, weaknesses in procedural and visual-spatial memory are also reported in the literature (Alloway & Archibald, 2008; Archibald & Gathercole, 2006; Bavin, Wilson, Maruff, & Sleeman, 2005; Gabriel et al., 2013; Hedenius et al., 2011; Lum, Conti-Ramsden, Page, & Ullman, 2012; Lum, Gelgic, & Conti-Ramsden, 2010; Montgomery et al., 2010). Though the wide range of memory weaknesses is likely due to the intrinsic heterogeneity of the disorder itself, it may also reflect an underlying global impairment that impacts language along with other cognitive domains.
Comorbidity of Language and Attention Impairments

The relationship between language and attention warrants further discussion due to the current study’s investigation of OR in a sample of children suspected of ADHD, SLI, and a combination of both. Studies estimate that approximately 40% to 50% of children with ADHD also meet diagnostic criteria for SLI (J. H. Beitchman, Nair, Clegg, Ferguson, & Patel, 1986; Nancy J. Cohen et al., 2000; Tirosh & Cohen, 1998). Given the astoundingly high comorbidity rates, a number of studies have attempted to identify shared underlying deficits. Some studies report that verbally- and nonverbally-based cognitive deficits, such as low IQ and poor visual-motor integration, are common to both SLI and ADHD children (R.A. Barkley, 1990; J. K. Johnston, 1988). However, children with comorbid SLI +ADHD exhibit more severe impairments in visual-motor integration and general cognitive functioning, suggesting they are not shared underlying aspects, but rather overlapping effects from each, individual disorder (Joseph H. Beitchman, Tuckett, & Batth, 1987; Nancy J. Cohen et al., 2000).

In a similar vein, research shows that individuals with SLI and ADHD exhibit similar general-area deficits, but with some modality-specific difference between verbal versus auditory domains. For instance, a comparison of nonverbal and verbal processing speed between children with SLI, ADHD, and typical language development (TLD) revealed that, while the highest percentage of impaired auditory processing was found among SLI children, ADHD children were more significantly impaired than TLD children (Oram Cardy, Tannock, Johnson, & Johnson, 2010). Moreover, ADHD children performed significantly slower on a nonverbal processing speed task than SLI children, whose performance was relatively slower than TLD children on simpler tasks, but roughly equivalent on a complex-speeded task.
Modality-specific differences in sustained attention also emerged in a study examining the performance of ADHD and SLI children on auditory versus visual Continuous Performance Tests (Gomes, Wolfson, & Halperin, 2007). Whereas ADHD symptoms predicted errors on both visual and auditory CPT’s, SLI symptoms only predicted errors on auditory CPT’s. Moreover, SLI children were more prone to omission, but not commission errors, whereas the reverse was true for ADHD children. This indicates that compromised inhibitory control is more linked to ADHD, and SLI is more exclusively related to auditory inattention. This particular finding is corroborated in a recent meta-analysis revealing profound deficits in sustained auditory attention in SLI (Ebert & Kohnert, 2011).

Differences between auditory and spatial working memory are also reported in the literature (Ebert & Kohnert, 2011; Jonsdottir, Bouma, Sergeant, & Scherder, 2005). Jonsdottir et al. (2005) found that, while ADHD-SLI children demonstrated significantly greater impairment on verbal working memory tasks than ADHD-only children, both groups’ performance was intact on spatial working memory. However, pervasive working memory deficits are generally regarded as more typical of SLI children (Nancy J. Cohen et al., 2000; Hutchinson, Bavin, Efron, & Sciberras, 2012), due to the central role of verbal mediation across multiple areas of memory and cognitive processing (Russell A. Barkley, 1997; Denckla, 1996a). Nevertheless, evidence also suggests that verbal and spatial working memory are often impaired in ADHD, irrespective of language impairment (McInnes, Humphries, Hogg-Johnson, & Tannock, 2003). Previous attempts to differentiate the effects of ADHD and SLI when they co-occur have proven largely unsuccessful, for the contemporaneous impairments in attention and language produce an even more complex neurocognitive profile.
Etiology

Research indicates that a combination of genetic and environmental factors contribute to impaired speech and language processes (Dorothy V. M. Bishop, Price, Dale, & Plomin, 2003; Hayiou-Thomas, Dale, & Plomin, 2012). Family and twin studies provide evidence for strong heritability of developmental speech and language pathology (D. V. M. Bishop, North, & Donlan, 1995; Conti-Ramsden, Falcaro, Simkin, & Pickles, 2007; Stromswold, 1998; Viding et al., 2004). For example, Conti-Ramsden et al. (2007) revealed that among children with SLI, 35% of adult relatives and 40% of child siblings displayed elevated rates of language difficulties. Moreover, consistent with other research (Viding et al., 2004), SLI severity predicted higher prevalence of the disorder among family members. D. V. M. Bishop et al. (1995) reported concordance rates of 72% for monozygotic- and 49% for dizygotic-twins, and was also able to identify common genetic risk factors for associated impairments on motor and spoken language tests\(^{14}\). In a more recent publication, however, Bishop cautions that heritability estimates in the literature are inconsistent due to the variable diagnostic criteria used by researchers\(^{15}\) (D. V. M. Bishop & Hayiou-Thomas, 2008).

Examinations of the brain morphology of individuals with SLI consistently reveal structural brain abnormalities and atypical patterns of cerebral asymmetry in the Perisylvian region\(^{16}\), frontal regions, the pars triangularis\(^{17}\), and regions of the parietal lobe (Galaburda, Sherman, Rosen, Aboitiz, & Geschwind, 1985; Gauger, Lombardino, & Leonard, 1997; Jemigan, Hesselink, Sowell, & Tallal, 1991; Plante, Swisher, Vance, & Rapcsak, 1991). Reductions in

\(^{14}\) When using more liberal diagnostic criteria (e.g. past history of language pathology and less pronounced verbal-nonverbal discrepancies) concordance rates for monozygotic twins approached 100% and approximately 50% for dizygotic twins (D. V. M. Bishop et al., 1995).

\(^{15}\) D. V. M. Bishop and Hayiou-Thomas (2008) noted higher heritability rates were reported when SLI was defined in terms of referral to speech and language pathologist than when determined by language test scores.

\(^{16}\) The Perisylvian region holds the majority of language tissue, including Broca’s area.

\(^{17}\) The pars triangularis is a portion of Broca's area and plays an important role in speech and language production.
cerebral volume, primarily related to white- and gray-matter-abnormalities (e.g. lesions and volumetric reductions), are also reported in the literature (Preis, Engelbrecht, Huang, & Steinmetz, 1998; D. Trauner, Wulfeck, Tallal, & Hesselink, 2000; K. E. Watkins et al., 2002).

A number of biological risk factors, including premature birth, low birth weight, multiple births, high birth order (3rd or more), late or no prenatal care, maternal age over 35, history of maternal medical problems, presence of a newborn condition or congenital abnormality, and prenatal exposure to alcohol and cocaine, are identified as significant risk factors for SLI (Bandstra et al., 2002; Delgado, Vagi, & Scott, 2005; Singer et al., 2001; Stanton-Chapman, Chapman, Bainbridge, & Scott, 2002). However, while there is clear evidence to support a biological predisposition for SLI, extensive research also demonstrates the profound impact of the environment with respect to etiology, as well as its interaction with endogenous factors, in determining the onset and trajectory of the disorder.

Developmental Perspectives

The capacity to understand and use language cultivates the ability to think, learn, and engage in social relationships. Given that language develops within the context of a caregiving relationship, it is necessary to take the quality of this early relationship and the general environment into account. For instance, socioeconomic status and maternal educational attainment are consistently identified as risk factors due to the emotional strains of poverty and more limited access to educational resources and supports (Fernald, Marchman, & Weisleder, 2013; Prior, Bavin, Cini, Eadie, & Reilly, 2011; Pruitt, Garrity, & Oetting, 2010; Stanton-Chapman et al., 2002).

The impact of infant-caregiver attachment quality on language development and communicative competence is also well-substantiated by research (Klann-Delius & Hofmeister,
Marked deficits in language and communication skills are historically recognized as outcomes of severe emotional deprivation during infancy and early childhood (Greenspan & Shanker, 2004; Spitz, 1946). In a similar vein, maternal depression, which typically interferes with maternal sensitivity, responding, and engagement with the infant, is shown to predict diminished language and cognitive performance among children (Chapin & Altenhofen, 2010; Glascoe & Leew, 2010; Quevedo et al., 2012; Sohr-Preston & Scaramella, 2006; A. Stein et al., 2012). These findings correspond with observational studies demonstrating that the frequency of joint-attention behaviors between mother-infant and mother-toddler dyads is negatively associated with language acquisition and communication skills (Gauthier, Genesee, Dubois, & Kasparian, 2013; Markus, Mundy, Morales, Delgado, & Yale, 2000; Saxon, 1997; Tomasello & Todd, 1983). Likewise, while depressed mothers tend to provide less cognitive stimulation for the infant, the adverse effects of depression exceed the effects of mere under-stimulation (Chapin & Altenhofen, 2010; Zajicek-Farber, 2010).

A meta-analysis examining the influence of attachment quality on language and cognitive development revealed a robust relationship to language outcomes and, a significant, but less strong association with cognitive development (van Ijzendoorn, Dijkstra, & Bus, 1995). Disturbed attachment has also been linked to developmental language problems that resemble those of Pervasive Development Disorder (Shin, Lee, Min, & Emde, 1999). Research on the effects of infant maltreatment further corroborates the adverse effects of problematic caregiving environments on language development. A study by Gersten, Coster, Schneider-Rosen, Carlson, and Cicchetti (1986) revealed that, while maltreated infants are generally at greater risk for developing insecure attachments, maltreated infants classified as securely attached achieved
more sophisticated language skills at 24 months (e.g. syntactic complexity, elaborate vocabulary, frequent references to objects, self, and other). Further, in comparison to the secure/mistreated children, insecure/non-mistreated, and secure/non-mistreated children, and insecure/mistreated toddlers were the most compromised in their internal state language and conversational relatedness. These findings are correspond with other research showing that maltreated infants are more likely to develop severe impairments in vocabulary, syntax, functional communication, and social discourse, and to possess a more limited repertoire for expressing emotions and physiological needs, even when controlling for overall language ability (Beeghly & Cicchetti, 1994; Coster & Cicchetti, 1993; Coster, Gersten, Beeghly, & Cicchetti, 1989). Therefore, there is compelling evidence to conclude that, in addition to constraining language and social communication abilities, impoverished and hostile caregiving environments exert detrimental effects on the development of the self.

Language is an essential tool for organizing affect and behavior, fostering self- and other-awareness, and building self-regulatory capacities. Main (1995) and Slade (2000) regard language as a supportive structure that helps to organize the mother, the auxiliary ego of the baby, and ultimately the child himself as language development unfolds. Self-verbalization, which is aided by internalization of the caregiver, is particularly important for self-regulation and control (Russell A. Barkley, 1997; Gallagher, 1999; Luria, 1961; Vygotsky, 1962). Words, which initially function as indicators of need and exploration, eventually serve as the medium through which one can construct and share narratives that organize and contain psychic experience.

Accordingly, research indicates that adult-child conversations about emotions facilitate language and emotional development. Mothers who use more sophisticated emotional language
and communicate more effectively about emotions tend to have children who display more advanced social competence and self-regulatory capacities (Denham, Cook, & Zoller, 1992; Zahn-Waxler, Ridgeway, Denham, Usher, & Cole, 1993). However, the child’s language proficiency is also shown to influence the manner in which parents communicate. Stansbury and Zimmermann (1999) found that, in response to a frustrating task, parents of children with lower verbal comprehension used more unexplained compliance demands and fewer cognitive and distraction strategies to regulate their children than mothers of TLD children. As such, SLI appears to obstruct verbal channels of communication between parent and child, which limits the parent’s repertoire of effective communication strategies with the child.

More generally, research indicates that mothers of language-delayed children use divergent communicative and parenting behaviors than mothers of TLD children (e.g. Conti-Ramsden, 1990; Pelligrini, Brody, & Sigel, 1985; Petersen & Sherrod, 1982). In a cross-sectional study comparing parenting behaviors of TLD and SLI children, Hammer, Tomblin, Zhang, and Weiss (2001) found that during pre-school years, parents of TLD children were more likely to have read to, told stories, and discussed daily events, activities and feelings with their children than parents of SLI children. Parents of children with SLI, on the other hand, more frequently taught their kindergarten-aged children the alphabet, a skill children typically mastered before entering school\textsuperscript{18}, and used more discipline. Therefore, the manner in which caregivers responds to the child’s diminished language capacity has a major impact on subsequent academic and psychosocial functioning.

\textsuperscript{18} Maternal education attainment and socioeconomic status were controlled for in this investigation (Hammer et al., 2001).
Psychiatric Comorbidity

Children with SLI are frequently diagnosed with comorbid psychiatric problems. Research also shows that many children with psychiatric diagnoses have previously unidentified language impairments (Joseph H. Beitchman, Wilson, et al., 2001; Camarata, Hughes, & Ruhl, 1988; Cantwell & Baker, 1991; Nancy J. Cohen et al., 1998; Noterdaeme & Amorosa, 1999). For example, Nancy J. Cohen et al. (1998) found that in a sample of 380 children (ages 7–14) referred for psychiatric services, 40% had a previously unidentified language impairment. Further, a longitudinal study following a cohort of SLI children from age five to 19 revealed that approximately 40% met criteria for at least one psychiatric disorder at some point (Joseph H. Beitchman, Wilson, et al., 2001). For this reason, language impairment is considered a risk factor for psychiatric disorders (Toppelberg & Shapiro, 2000).

As previously mentioned, ADHD is by far the most common comorbid disorder, with prevalence estimates ranging between 40% and 50% (J. H. Beitchman et al., 1986; Nancy J. Cohen et al., 2000; Tirosh & Cohen, 1998). However, other frequent co-occurring conditions include, conduct- and oppositional-defiant-disorders, anxiety disorders, depression and dysthymia, selective mutism, and childhood schizophrenia (J. H. Beitchman et al., 1986; Joseph H. Beitchman et al., 1996; N.J. Cohen, 2001, pp. 16-22; Nancy J. Cohen et al., 1998; Nancy J. Cohen, Davine, Horodezky, Lipsett, & Isaacson, 1993; M. Donahue, Cole, & Hartas, 1994; Kristensen, 2000; Manassisi et al., 2007; Wadman et al., 2011; Warr-Leeper, Wright, & Mack, 1994).

Behavioral and Emotional Issues

Children with SLI also suffer from a host of behavioral and emotional difficulties that interfere with social adjustment. A recent meta-analysis of prospective cohort studies of SLI and
TLD children revealed that children with SLI are twice as likely to exhibit significant levels of internalizing, externalizing, and ADHD symptoms (Yew & O'Kearney, 2013). Whereas the average TLD child’s symptom severity was in the 50th percentile at follow-up, the average SLI child evidenced more clinically significant scores: 72nd percentile for internalizing symptoms, 69th percentile for externalizing symptoms, and 60th percentile for ADHD severity. However, it is important to note that a number of other longitudinal studies demonstrate considerable prognostic variability in the emotional and behavioral trajectories of SLI (Durkin & Conti-Ramsden, 2010; Lindsay & Dockrell, 2012; Lindsay et al., 2007; Snowling et al., 2006).

Externalizing behaviors (i.e. hyperactivity, inattention, and conduct problems) are estimated to occur in 35% to 50% of SLI children (Dockrell & Lindsay, 2007; van Daal, Verhoeven, & van Balkom, 2007). As previously noted, it is well-established in the literature that language difficulties are have a robust relationship with hyperactivity and attention problems in elementary school children (Nancy J. Cohen et al., 2000; Lindsay et al., 2007; Lundervold, Heimann, & Manger, 2008). Conduct problems and aggressive behavior are also consistently reported among pre-school and elementary-school children with language difficulties (Botting & Conti-Ramsden, 2000; Ketelaars et al., 2010; Tomblin, Zhang, Buckwalter, & Catts, 2000; van Daal et al., 2007). Additionally, there is some evidence to suggest a higher risk for conduct problems, antisocial behavior, substance abuse, and delinquency in adolescence and young adulthood (Joseph H. Beitchman, Adlaf, et al., 2001; Joseph H. Beitchman, Wilson, et al., 2001; Brownlie et al., 2004; Clegg, Stackhouse, Finch, Murphy, & Nicholls, 2009).

A number of studies also report elevated rates of internalizing and emotional problems (Conti-Ramsden & Botting, 2008; McCabe & Meller, 2004; Redmond & Rice, 1998, 2002; van Daal et al., 2007). Withdrawn behavior and somatic complaints were identified as the most
common forms of internalizing symptoms in a study by van Daal et al. (2007). Stanfon-Chapman, Justice, Skibbe, and Grant (2007) found a high incidence of withdrawal, inhibition, and anxiety in SLI, as compared to TLD children. Such difficulties may be related to inferior emotion regulation skills, which are also observed among SLI children, and likely contribute to the range of psychosocial adjustment problems (Fujiki, Brinton, & Clarke, 2002; Fujiki, Spackman, Brinton, & Hall, 2004).

**Social Functioning**

Extensive research shows that SLI children are compromised in multiple aspects of social functioning. Social withdrawal is frequently cited in studies of the social characteristics of SLI children (Fujiki, Brinton, Isaacson, & Summers, 2001; Fujiki, Brinton, Morgan, & Hart, 1999; Redmond & Rice, 1998). For example, Fujiki, Brinton, Morgan, et al. (1999) found that teachers rated SLI students as displaying more reticent behaviors, solitary-active withdrawal, and lower sociable behavior than their TLD peers. This was further illustrated in an observational study in which SLI children were found to engage in significantly fewer peer interactions and more withdrawn social behavior during recess. Other studies indicate that SLI children are less responsive to social initiation, have difficulty initiating social interactions, participate in fewer interactions, are addressed less frequently, and are more likely to be ignored by peers (Brinton & Fujiki, 1982; N.J. Cohen, 2001; Craig & Washington, 1993; Hadley & Rice, 1991; McCabe & Marshall, 2006; Rice, Sell, & Hadley, 1991).

When social exchanges do occur, significant interaction problems are also noted. Consistent findings reveal less developed social skills and social competence than TLD children (Botting & Conti-Ramsden, 2000; Fujiki, Brinton, & Todd, 1996; Redmond & Rice, 1998; Stanfon-Chapman et al., 2007). In a study by McCabe (2005), SLI children exhibited particular
difficulty with task orientation, assertiveness, peer social skills, frustration tolerance, and were more likely to be dependent and isolated in the classroom. Difficulties with participation in ongoing dyadic and group interactions are also observed (Brinton, Fujiki, Montague, & Hanton, 2000; Brinton, Fujiki, Spencer, & Robinson, 1997; Hadley & Rice, 1991; Rice et al., 1991), as well as ineffective negotiation and resolution strategies with peers (Brinton, Fujiki, & McKee, 1998; Horowitz, Jansson, Ljungberg, & Hedenbro, 2006).

The array of social deficits encumber the SLI child’s ability to establish and maintain friendships. SLI children tend to possess fewer and less satisfying peer relationships (Durkin & Conti-Ramsden, 2007; Fujiki et al., 1996; Redmond, 2011), and are generally less accepted and well-liked by their peers (Craig, 1993; Fujiki, Brinton, Hart, & Fitzgerald, 1999; Gertner, Rice, & Hadley, 1994; Laws, Bates, Feuerstein, Mason-Apps, & White, 2012). A number of studies also report an elevated risk for peer victimization and bullying (Conti-Ramsden & Botting, 2004; Knox & Conti-Ramsden, 2007; Redmond, 2011). In a study examining rates of peer victimization among SLI, ADHD, and TLD children, Redmond (2011) found that while general clinical status predicted increased victimization, this was especially true for SLI children who reported the most physical bullying and evidenced the highest risk for peer victimization (e.g. SLI: 40%; ADHD: 20%; TD: 10%). Moreover, the number of close friendships buffered against victimization for ADHD and TD children, but not for SLI children.

Social-Cognitive and Neurocognitive Underpinnings

The alarming range of social adversities encountered by SLI children has prompted researchers to investigate the interplay between underlying neurocognitive impairments and various aspects of social functioning. Researchers attribute the extensive level of social difficulties to underlying deficits in social cognitive processing (Botting & Conti-Ramsden,
2008; Nancy J. Cohen et al., 1998; Farmer, 2000; Marton et al., 2005), social and emotional knowledge (McCabe & Meller, 2004; Timler, 2008), and emotional understanding (Spackman, Fujiki, & Brinton, 2006). A number of studies examining interpersonal negotiation and conflict resolution strategies in response to hypothetical social scenarios reveal that SLI children produce less mature responses and poorer negotiation strategies that TLD children (Nancy J. Cohen et al., 1998; Marton et al., 2005; Timler, 2008). Impaired social-cognition, emotional understanding, and social and emotional knowledge were further evidenced by their pronounced difficulties in defining the actual conflict, identifying feelings of each party involved, selecting the best resolution strategy, identifying and overcoming obstacles that might thwart success of the solution, and recognizing when the problem was resolved (Nancy J. Cohen et al., 1998).

Limited emotional knowledge and understanding was also revealed in another study in which SLI children generated more inaccurate emotional inferences and less sophisticated emotional descriptions in response to hypothetical social scenarios (Spackman et al., 2006). Though this finding is in line with research demonstrating poorer performance on Theory of Mind (ToM) tasks (Farmer, 2000; Farrant, Fletcher, & Maybery, 2006; Farrant, Maybery, & Fletcher, 2012; Miller, 2001), there is evidence to suggest that the impaired performance is better accounted for by the high language demands of the task rather than a specific ToM deficit. For example, Miller (2001) showed that SLI children perform similarly to age-matched TLD peers when less complex language was used on the ToM task, but not when linguistic complexity was high, suggesting that the language demands of a task must be considered as a potential limitation and confounding variable when assessing the capacities and skills of SLI children.

A corresponding pattern emerges for the ability to interpret emotions from nonverbal auditory cues (e.g. vocal affect, prosody) with varying language demands. When asked to
interpret prosodic cues of emotion in words or phrases of unfiltered (i.e. regular) speech, SLI children perform significantly worse than TLD children (Berk, Doehring, & Bryans, 1983; Courtright & Courtright, 1983; Fujiki, Spackman, Brinton, & Illig, 2008; D. A. Trauner, Ballantyne, Chase, & Tallal, 1993; van der Meulen, Janssen, & Os, 1997). For example, Fujiki et al. (2008) investigated the emotional understanding of prosodic cues by presenting 19 SLI children and an age-matched control group with an unfiltered seven-sentence narrative read by actors to express happiness, anger, sadness, and fear. When asked to indicate what emotion the speaker expressed, SLI children had significantly greater difficulty identifying the expressed emotion. However, research shows that when syntactic and semantic information is either minimized or eliminated by filtering speech, SLI children demonstrate equivalent capacity for understanding emotion conveyed by prosodic cues (Creusere, Alt, & Plante, 2004; Wells & Peppé, 2003). Creusere et al. (2004) demonstrated that SLI pre-school children recognized affect as frequently as TLD children when presented with filtered speech (with or without an photographed facial expression), but performed significantly worse when unfiltered speech stimuli were presented alone or in conjunction with facial cues. This suggests that children with SLI may not be impaired in emotional understanding per se, but have specific difficulties processing emotional information through verbal channels.

Research contrasting the auditory- and visual-emotion recognition capacities of SLI children yields parallel findings. Studies indicate that, while SLI tend to have profound deficits for auditory/verbal cues, their ability to detect visual/facial cues is intact (Boucher et al., 2000; Nancy J. Cohen et al., 1998; J. A. Ford & Milosky, 2003; Spackman, Fujiki, Brinton, Nelson, & Allen, 2005; D. A. Trauner et al., 1993). In general, children with SLI perform equally well on tasks of labeling and identifying affect from photographed facial expressions (Dimitrovsky,
Spector, Levy-Shiff, & Vakil, 1998; McCabe & Meller, 2004). However, when verbal demands are added, their performance deteriorates (Boucher et al., 2000; Nancy J. Cohen et al., 1998). Boucher (2000) posited the notion of a cross-modal impairment in SLI in response to findings that SLI children not only exhibit greater impairment on a task of vocal-facial-affect matching than children with TLD, but also children diagnosed with autism spectrum disorders.

In a similar vein, Cohen (1998) revealed that, while SLI and TLD children were equally adept on a task of identifying emotions associated with photographs (i.e. visual condition), SLI children made significantly more errors in identifying the corresponding photographed emotion when a verbal component was added in the form of a brief story (i.e. visual-verbal condition). In another study, SLI children (ages 9-13) evidenced significantly greater difficulty than TLD children in identifying which of three emotions was conveyed by an actress reading short phrases with happy, sad, or angry vocal tones (D. A. Trauner et al., 1993). However, they were as accurate for identifying facial expressions and, interestingly, performed even better than TLD children on a task in which they were asked to model faces to express how they would feel in a given situation. Therefore, despite being compromised in verbal modes of relating, SLI children are proficient at deciphering visual-perceptual cues of social information.

**OR Assessment on the Rorschach and Thematic Apperception Test (TAT)**

The intact capacity for the perception of nonverbal social cues is of particular relevance to the present study, which hypothesizes that children with more significant language symptomatology will attain more mature OR scores on the Rorschach, a predominantly nonverbal/perceptual task with lower language demands, than the Thematic Apperception Test (TAT; Morgan & Murray, 1935). The TAT consists of a series of black-and-white pictured cards depicting evocative, ambiguous character scenes for which the respondent generates a narrative
that describes the scene, the characters’ thoughts and feelings, the events leading up to the scene, and a future outcome. In contrast to the Rorschach, which emphasizes the relationship between perception and personality, Henry Murray considered *appereception*, or the ascription of meaning to what is perceived, as fundamental to the understanding of personality dynamics (H. A. Murray, 1938). Thus, the major assumption of the TAT is that the stories constructed about each of the character scenes reveals important facets of the individual’s personality.

As a narrative-based task, the TAT relies on higher-level language and cognitive skills in order to create a cohesive, well-formulated, and meaningful story. This can prove especially challenging for children with linguistic weaknesses (e.g., phonology, semantic, syntactic, pragmatic) that compromise narrative skills (N.J. Cohen, 2001). Indeed, a number of studies using structured narrative tasks reveal that SLI children’s narratives have poorer macrostructure (i.e. global organization of content) and microstructure (i.e., grammatical sentence structure, within subordinate clause productivity, and textual cohesion; Fey, Catts, Proctor-Williams, Tomblin, & Zhang, 2004; Liles, 1985; Manhardt & Rescorla, 2002; Merritt & Liles, 1987; Rhea Paul, Hernandez, Taylor, & Johnson, 1996; Rhea Paul & Smith, 1993; Wagner, Sahlén, & Nettelbladt, 1999).

In comparison to TLD children, SLI children’s narratives tend to comprise fewer, shorter, and less complex sentences and clauses; fewer cohesive ties; more tense errors; poorer syntax; and a less diverse and sophisticated use of vocabulary (Liles, 1985; Merritt & Liles, 1987; Norbury & Bishop, 2003; Rhea Paul et al., 1996; Rhea Paul & Smith, 1993). Research by Fey et al. (2004) demonstrated that, in addition to obtaining lower scores on measures of word diversity and grammatical accuracy, SLI children’s overall narrative quality was poorer in terms of the development of characters, setting, plot complexity, ending, and language sophistication. Parallel
findings were revealed by Merritt and Liles (1987), who found that SLI children produced fewer complete story episodes, more incomplete episodes, a lower mean number of main and subordinate clauses per episode, and lower use of story grammar components. They also exhibited more difficulty linking critical parts of the stories together, further reflecting general weaknesses in structuring and organizing language into cohesive narratives.

In light of these findings, the current study’s investigation of whether children with greater language symptomatology will exhibit greater OR impairment on the TAT than the Rorschach is apropos. A comparison of the OR quality between the Rorschach and TAT will not only yield useful insight into the reciprocal relationship between language and OR development, but also may inform whether language-based instruments color the clinical assessment of children with linguistic weaknesses. Such an investigation, however, relies on the use of a comparable measure of OR across the two projective instruments. For this reason\(^\text{19}\), the current study endeavored to adapt the Mutuality of Autonomy Scale (MOA; Urist, 1977; Urist & Shill, 1982), a measure predominantly used for the Rorschach, to the TAT. In addition to allowing for greater cross-comparison equivalence, the MOA Scale is the optimal measure because it is a well-established for pediatric samples (Steven Tuber, 1992), and is regarded as an implicit assessment of OR (Fowler & Erdberg, 2005). Both are essential features given that the study sample is comprised of children at-risk for language and attention impairments.

Though the current study is the first to adapt the MOA to the TAT, the original MOA research applied the scale to autobiographical descriptions of patients’ relationships, a task based on the work of Henry Murray (1938); staff ratings of patients’ interpersonal behavior on the

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\(^{19}\) The standard TAT measure of OR (Westen, Lohr, Silk, Kerber, & Goodrich, 1985) was deemed inappropriate for the current study because it is not well-validated in child samples and is purported to be especially limited for children with learning disabilities (Freedenfeld, Ornduff, & Kelsey, 1995; Ornduff & Kelsey, 1996; Westen, Ludolph, Block, Wixom, & Wiss, 1990).
ward; clinical charts; and therapist ratings of patients (Urist, 1977; Urist & Shill, 1982).
Moreover, there are a number of studies in the literature demonstrating successful adaptions of OR measures from one clinical instrument to another (Krohn & Mayman, 1974; Segal, Westen, Lohr, Silk, & Cohen, 1992; Spear & Lapidus, 1981). Hence, it is expected that children with higher levels of language symptomatology will evidence more significant OR disturbance on the TAT than the Rorschach.

**Object Relations Theory and Assessment Research**

In its broadest terms, object representations refer to conscious and unconscious mental representations of self and others that comprise cognitive, affective, and experiential aspects of relationships (Huprich & Greenberg, 2003; Stricker & Healey, 1990; Westen, 1991). Object Relations (OR) Theory is a branch of psychoanalysis emphasizing the impact of early relational experiences on personality development and psychopathology. Founded in the early 1940’s by the British School of Object Relations, a group of theorists whose views deviated from Melanie Klein and Anna Freud, OR theory rebuffs the centrality of sexual and aggressive drives in the classic psychoanalytic model. Replacing the conventional pleasure-seeking infant with an object-seeking one (Fairbairn, 1952, 1963), OR theory incited a paradigm shift that turned focus to the caregiving relationships as the primary facilitator of developmental processes and outcomes.

The infant, born without any object relational awareness, acquires a sense of self and others through interactions with caregivers (Fonagy, Gergely, Jurist, & Target, 2002; Gergely, 2007; Kernberg, 1966, 2001; Kohut & Wolf, 1978; Mahler, Pine, & Bergman, 1973, 2000; Ed Tronick, 2010; Winnicott, 1945). The quality of early interpersonal experiences are internalized, shaping the manner in which individuals perceive themselves and others. A large body of research on maternal sensitivity, parent-infant interactions, and infant attachment status

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20 At the time, Melanie Klein and Anna Freud were the dominant figures in the psychoanalytic community.
substantiates the import of these early interactions in facilitating development, secure attachment, and socio-emotional functioning (Beebe et al., 2010; Beebe, Lachmann, Markese, & Bahrick, 2012; De Wolff & van Ijzendoorn, 1997; Grossmann, Grossmann, & Waters, 2005; Kochanska et al., 2010; Ed Tronick, 2010; Ed Tronick & Beeghly, 2011; Edward Tronick & Reck, 2009). Thus, children who experience caregivers as responsive and available are more likely to internalize a positive view of self and others, which supports socio-emotional functioning. Experiences of neglect, abandonment, and abuse in early interactions engender perceptions of self as worthy of maltreatment and of others as malevolent and threatening which, in turn, disrupts socio-emotional development (Aber & Allen, 1987; Baer & Martinez, 2006; Grossmann et al., 2005; Hankin, 2005; Lyons-Ruth, Connell, Zoll, & Stahl, 1987).

The vast literature on object relations corroborates the extent to which OR disturbances are intertwined with multiple forms of psychopathology (Bedi, Muller, & Thornback, 2012; Bell, Billington, Cicchetti, & Gibbons, 1988; Berg, Packer, & Nunno, 1993; Goddard & Tuber, 1989; Heesacker & Neimeyer, 1990; J. F. Murray, 1985; Rutherford, Cacciola, Alterman, & McKay, 1996; Westen, 1991; Westen, Lohr, Silk, Gold, & Kerber, 1990; Westen, Ludolph, Lerner, Ruffins, & Wiss, 1990). Because OR theory was originally most concerned with disorders of the self (Kernberg, 1966, 2001; Kohut, 1966; Kohut & Wolf, 1978; Winnicott, 1945), a substantial portion of the literature focuses on personality disorders (Bell et al., 1988; Blais, Hilsenroth, Fowler, & Conboy, 1999; Diamond, Kaslow, Coonerty, & Blatt, 1990; Fowler, Hilsenroth, & Nolan, 2000; J. F. Murray, 1985; Spear & Sugarman, 1984; Stuart et al., 1990; Westen, Ludolph, Lerner, et al., 1990). Nevertheless, OR disturbances are shown to be implicated in the full gamut of psychological disorders in both adults and children (Blatt, Wild, & Ritzler, 1975; Fowler, Brunnschweiler, & Brock, 2002; Goddard & Tuber, 1989; Heesacker & Neimeyer, 1990;
Rutherford et al., 1996; Strauss & Ryan, 1987; Steven Tuber & Coates, 1989). This invaluable line of research instantiates OR theory by empirically demonstrating the momentous impact of early relational experiences on subsequent socio-emotional functioning and psychological well-being.

There are a number of empirically established measures that employ different methods in their assessment of OR. Projective techniques, narrative data, and self-report questionnaires are the most commonly used methods (for reviews, see Huprich & Greenberg, 2003; Stricker & Healey, 1990). Projective techniques are preferred by many researchers because of their ability to tap unconscious phenomena. The highly ambiguous nature of the Rorschach and TAT make them optimal for assessing OR because they evoke the projection of one’s internal representational world onto the cards. This particular method of OR assessment is employed in the current study and thus, an overview of the research on OR assessment via the TAT and Rorschach will be provided herein.

**TAT Assessment of Object Relations**

The Social Cognition and Object Relations Scale (SCORS; Westen et al., 1985) is the most widely used OR measure for the TAT. It integrates social-cognitive and object-relational perspectives in the assessment of OR, and has strong empirical support for reliability and validity in clinical and nonclinical samples of adolescents and adults (Ackerman, Clemence, Weatherill, & Hilsenroth, 1999; Barends, Westen, Leigh, Silbert, & Byers, 1990; Hibbard, Hilsenroth, Hibbard, & Nash, 1995; Westen, Lohr, et al., 1990). Pathological OR, as measured by the SCORS, is associated with a broad range of psychological disorders (Bedi et al., 2012; Huprich, 2001; Huprich, Porcerelli, Binienda, Karana, & Kamoo, 2007; Kernhof, Kaufhold, & Grabhorn,
Although the SCORS is not utilized in the current study, a brief overview of the measure will be provided before discussing the SCORS literature. The original SCORS (Westen, 1995) encompasses four dimensions: (1) Complexity of Representation—the extent to which self and other are differentiated; (2) Affect Tone of Relationships—the degree to which representations are characterized as benevolent or malevolent; (3) the Understanding of Social Causality—the extent to which causal attributions ascribed to the character’s actions, thoughts, and feelings are logical, accurate, complex, and psychologically-minded; and (4) Capacity for Emotional Investment in Relationships and Moral Standards—the extent to which others are regarded in terms other than need-gratification, to which moral standards are considered, and to which relationships are experienced as meaningful and committed. This particular dimension is divided into two separate domains—Capacity for Emotional Investment and Moral Standards—on the SCORS-Q (Westen, 1995), a modified version of the scale that employs a Q-sort method for rating narratives. Another modified version of the scale, the SCORS-Global (SCORS-G; Hilsenroth, Stein, & Pinkster, 2007; Stein, Slavin-Mulford, Sinclair, Siefert, & Blais, 2012), includes an overarching global rating scale and three additional dimensions: Experience and Management of Aggressive Impulses, Self-Esteem, and Identity and Cohesiveness of Self.

A number of researchers subsume Complexity of Relationships and Understanding of Causality under an overarching cognitive domain, and Affect Tone and Emotional Investment under an affective domain (Hibbard et al., 1995; Leigh, Westen, Barends, Mendel, & Byers, 1992; J. Porcerelli, Cogan, & Hibbard, 1998). The cognitive domain is linked to particular areas of cognitive functioning, such as Full-Scale and Verbal IQ scores (Hibbard et al., 1995), and
word count of narratives (Leigh et al., 1992). The affective domain, on the other hand, is more consistently connected to psychopathology. For example, Hibbard et al. (1995) and J. Porcerelli et al. (1998) found that the affective, but not cognitive, SCORS dimensions predicted the severity of personality pathology. Nevertheless, other researchers show that impairments in the cognitive domain are not only evident in borderline personality disorder, but also distinguish between various types of psychological disorders (Eurelings-Bontekoe, Luyten, & Snellen, 2009; Kernhof et al., 2008; Stein, Pinsker-Aspen, & Hilsenroth, 2007; Westen, Lohr, et al., 1990).

Extensive research shows that more pathological OR across SCORS dimensions is associated with personality disturbances in adults. Several studies demonstrate a relationship to the level of personality organization (i.e., neurotic, borderline, and psychotic); the type of DSM-IV personality disorder; and the severity of personality pathology (Ackerman et al., 1999; Eurelings-Bontekoe et al., 2009; Hibbard et al., 1995; Hibbard, Porcerelli, Kamoo, Schwartz, & Abell, 2010; J. Porcerelli et al., 1998). For example, Hibbard et al. (2010) identified a direct correspondence between level of personality organization and OR maturity on all SCORS dimensions. Consistent with Kernberg’s model of personality pathology (Kernberg, 1966, 1985, 2001), the OR level of participants with neurotic personality organization were generally more complex and differentiated, positively-valenced, emotionally invested, and logical. In contrast, those with borderline and psychotic organizations expressed more malevolence, illogicality, self-other diffusion, and less object investment in their depictions of self and other. The SCORS’ capacity to discriminate more and less severe forms of personality pathology is further evidenced in a study comparing female borderline inpatients with- and without- histories of self-harm (Whipple & Fowler, 2011). Although both groups displayed pathological OR levels, borderlines with a history of self-harm displayed significantly more disturbed OR across all dimensions.
Certain dimensions of the SCORS are also shown to relate to particular forms of psychopathology, which provides insight into characteristic types of OR disturbances. A study by Ackerman et al. (1999) shows that borderlines demonstrate significant vulnerabilities in the domains of affect, morality, aggression, and identity diffusion; narcissists display particularly high self-esteem on the SCORS-G; and antisocial patients evidence severe deficiencies in understanding social causality, emotional investment in relationships, and complexity of representations. In a similar vein, deficits in the understanding of social causality were found among suicide attempters and individuals with a psychotic organization of personality (Eurelings-Bontekoe et al., 2009; Twomey et al., 2000).

**OR Assessment of Children.** The empirical validity of the SCORS for pediatric samples is far less substantiated, and few studies have utilized the measure to assess OR in children (Freedenfeld et al., 1995; Ornduff & Kelsey, 1996). Nevertheless, the studies that do exist yield important insights into OR development and its influence on psychosocial functioning. Research indicates that, while the complexity of representations, logicality of causal attributions, and capacity for object investment, appear to mature with age, affective experiences and relational expectations are formed earlier and tend to remain stable. Comparisons between the object representations of 2nd to 5th graders, 9th to 12th graders, and borderline adolescents to borderline adults, consistently reveal greater sophistication on all SCORS dimensions among more chronologically advanced groups, except for Affect Tone (i.e., malevolent vs. benevolent characterizations of self and others; Westen et al., 1991; Westen, Ludolph, Lerner, et al., 1990).

The stability of Affect Tone over the course of development dovetails with research showing the enduring effects of affective mis-attunement, emotional unresponsiveness, and maltreatment within the parent-infant dyad on subsequent attachment status and psychosocial
adjustment (Beebe et al., 2010; Beebe et al., 2012; Grossmann et al., 2005; Edward Tronick & Reck, 2009). Two studies exploring the SCORS in relation to adult attachment style further elucidate the convergence between negative OR and insecure attachment, as well as their power to taint experience of self and relationships, even into adulthood (Calabrese, Farber, & Westen, 2005; Stein, Siefert, Stewart, & Hilsenroth, 2011). In both clinical and nonclinical samples, securely attached individuals are far more likely to report positive affective experiences and expectations in relationships, greater emotional object investment, and higher self-esteem. The opposite is true for individuals with insecure and fearful attachment styles. As such, the quality of the affective experience with caregivers appears to lie at the heart of object relational development, and influences the manner in which children perceive themselves and their relationships as valuable and worthwhile.

When this sense of value goes awry or becomes distorted, pathology is more likely to ensue. This is aptly portrayed by Weise and Tuber (2004), who utilized the SCORS-Q to examine the OR quality of narcissistically-disturbed children in comparison to a clinical-control sample of latency-aged children. The narcissistically disturbed group evidenced less empathy, more difficulty managing aggressive impulses, and less stable self-esteem. They also expressed greater emotional investment in relationships which, although unexpected, the authors interpreted as a reflection of their overreliance on recognition from others to bolster their sense of grandiosity and self-cohesion (Weise & Tuber, 2004). Whereas OR disturbances relate to pathology in this study, Niec and Russ (2002) showed that healthier OR is linked to more adaptive levels of functioning in children. All dimensions of the SCORS-Q correlated with empathy and helpfulness, as measured by self- and teacher-report. Further, Understanding of Social Causality predicted greater organization, elaboration, and imagination in the child’s
fantasy play. The relationship between this cognitive domain of the SCORS and the capacity for play is reminiscent of the social interaction difficulties documented in the ADHD and SLI literature, which illustrates the role of underlying neurocognitive deficits in peer relationship problems (Fujiki, Brinton, Hart, et al., 1999; Fujiki, Brinton, Morgan, et al., 1999; Fujiki et al., 1996; Maedgen & Carlson, 2000; Nixon, 2001; Solanto et al., 2009).

Aside from the above studies, the majority of SCORS research on children’s OR focuses on the impact of relational trauma. In general, victims of childhood abuse appear to be at increased risk for OR disturbances (Ackerman et al., 1999; Ornduff & Kelsey, 1996; Westen, 1991). In comparison to a non-abused clinical-comparison groups, children subjected to physical and sexual abuse express more malevolent OR, as evidenced by lower mean scores and higher frequencies of pathological scores on all SCORS dimensions. This represents general impairment in typical interpersonal functioning, as well as heightened vulnerability to the activation of highly disturbing object-relational experiences (Freedenfeld et al., 1995; Ornduff, Freedenfeld, Kelsey, & Critelli, 1994).

Although this research does not directly pertain to the current study, there are oblique connections that are of note. As indicated in the ADHD and SLI literature, there is evidence to suggest that adverse and traumatic caregiving environments elevate the risk for language and attention impairments, and exacerbate the symptom severity of pre-existing disorders (Beeghly & Cicchetti, 1994; Deault, 2010; J. D. Ford et al., 2000; Gersten et al., 1986; Kaiser et al., 2011; Nikolas & Burt, 2010; Thorell et al., 2012). Thus, trauma exposures may trigger or exacerbate any predisposition to the disorders. Likewise, there is controversy in the literature regarding the differential diagnosis of ADHD and trauma, for their astoundingly high comorbidity rates makes
them difficult to tease apart (Conway, 2012; Daud & Rydelius, 2009; J. D. Ford et al., 2000; Husain, Allwood, & Bell, 2008; Szymanski et al., 2011)

Distinct patterns of OR disturbances seem to emerge in response to different forms of abuse. For example, studies show that sexually-abused boys exhibited more malevolent expectations and illogical attributions than clinical- and normal- controls (Lang, 1998), and sexually-abused girls possessed more malevolent OR than a non-abused clinical sample (Ornduff et al., 1994). In a study by Ornduff and Kelsey (1996), victims of sexual and physical abuse both depicted their object worlds as malevolent, unsafe, and hostile (i.e. Affect Tone); however, those who endured physical abuse were also inclined to a self-gratifying and egocentric orientation to relationships and social rules (i.e. Emotional Investment and Moral Standards). The implications of this study are further informed by a recent investigation of an adult community sample of abuse survivors in which lower emotional investment predicted PTSD symptomatology, while more malevolent Affect Tone predicted low self-esteem (Bedi et al., 2012). Thus, the object relational injuries sustained from different forms of abuse appear to differentially influence symptomatic presentations of disorders.

Research by Westen, Ludolph, Block, et al. (1990) further elucidates the differential impact of various forms of trauma on OR development. In their investigation of female adolescent inpatients, they cover a broader range of childhood traumatic experiences, including maternal separations, neglect, physical and sexual abuse, and parental psychiatric illness. Consistent with previous findings, sexual abuse victims portrayed more malevolent depictions of TAT characters. However, duration of abuse was also found to correlate with OR pathology on all SCORS dimensions, except for self-other differentiation, even despite its robust association to a high percentage of poorly differentiated, egocentric responses. This domain, which is
infrequently scored, reflects a poorly bounded sense of identity and self-other differentiation. Maternal psychiatric illness, alcohol abuse, and separations revealed a pervasive effect on most SCORS dimensions, and Affect Tone (i.e. malevolent/benevolent representations) was uniformly associated with a history of maternal difficulties. Paternal pathology was far less predictive of OR impairments. A history of neglect was associated with more malevolent responses and a higher percentage of illogical attributions, suggesting greater susceptibility to more negative and illogical attributions of other’s behavior. The adverse effects of abandonment and neglect are further supported by a study reporting lower mean scores and higher percentages of pathological responses across all SCORS dimensions in foster care children than a clinical comparison group (Heon, 2006).

In a similar vein, several studies specifically focusing on the loss of caregivers also demonstrate the pervasive impact on object relational development. Several of these studies utilize the Dietrich Object Relations and Representations Scale (DORORS; Dietrich, 1985), a less well-known, psychoanalytic OR scale designed for the TAT. The DORORS assesses 10 specific, nonglobal dimensions of internalized object relations and object representations on a 7-point scale, with higher scores representing healthier object relatedness21. Convergent validity with other OR assessments has been supported for this measure (J. H. Porcerelli & Dietrich, 1994).

The DORORS was originally designed to study the psychological ramifications associated with various forms of parental loss (J. H. Porcerelli & Dietrich, 1994). Investigations into the effects of parental death revealed that children who experience loss earlier in life exhibit

21 The 10 dimensions of the DORORS are: (1) object investment; (2) sadistic versus neutralized aggression; (3) object warmth; (4) quality/level of object relatedness; (5) empathy; (6) object love; (7) superego harshness versus superego benevolence; (8) helplessness versus internal sense of control; (9) psychological mindedness; (10) degree of depression.
more intense aggression and fervent denial of death themes (Dietrich, 1981, 1986). Dietrich and colleagues also studied the effects of parental loss via psychological illnesses, such as psychosis, severe borderline, and depressive pathology (Dietrich, Bell, Lycaki, & Sitaram, 1984, December, as referenced in Dietrich, 1986; Shabad, Worland, Lander, & Dietrich, 1979). A study of the enduring psychological effects experienced by children who lost a parent who was hospitalized for psychotic illnesses revealed that children who suffered serious psychological decompensations six to 10 years later were distinguishable from more adaptive children based on certain TAT elements, such as lack of individual initiative and autonomy, denial of mother-child relationships, and denial of negative outcomes (Shabad et al., 1979). Together, these studies indicate that early experiences of trauma and loss in parent-child relationships heighten the risk for later development of OR disturbances and pathology.

Assessment of Learning Disabilities. To date, neither the SCORS nor the DORORS have been used to directly examine the impact of attention and language impairments on OR development. However, a few SCORS studies contribute to a preliminary understanding of this potential relationship. For example, Calabrese et al. (2005) analyzed TAT responses of psychiatrically hospitalized children with a history of parental loss and found that ADHD children exhibited significantly more aggression, suggesting they are more prone to uncontrolled and mismanaged feelings of anger and aggression towards self and others. Similarly, in a study examining the OR quality of fire-setting children in comparison to a clinical-control group with comparable trauma histories, demographics, and clinical presentations, Murphy (2004) found that a significantly greater proportion of the fire-setting children had diagnosed learning disabilities. Parallel findings were revealed in the previously described study by Westen, Ludolph, Block, et al. (1990), in which a history of a diagnosed learning disability predicted
malevolent Affect Tone. Premature delivery, a significant risk factor for ADHD and SLI (Bhatta, Cleves, Casey, Cradock, & Anand, 2002; Cherkes-Julkowski, 1998; Stanton-Chapman et al., 2002), also significantly predicted lower Complexity of Representations and Affect Tone. However, the authors cautioned the readers of the limitations of these findings as there were only a few of these children and coders had difficulty rating their TATs. Nevertheless, together these findings are particularly relevant to the current study as it suggests that learning disabilities, which include ADHD and language-based vulnerabilities, may further render children vulnerable to OR disturbances.

**Rorschach Assessment of Object Relations**

Human responses on the Rorschach have long been considered an important indicator of psychological adjustment (Blatt & Ritzler, 1974; Draguns, Haley, & Phillips, 1967; Friedman, 1953; Kelly & Fiske, 1951; Parker & Piotrowski, 1968). However, interest in developing systematized methods for human-response analysis only began to emerge in the mid-1970’s (Blatt, Brenneis, Schimek, & Glick, 1976; Krohn & Mayman, 1974; Urist, 1977). Mayman (1967), who pioneered the integration of object relations theory and Rorschach assessment, eloquently explains the rationale behind the use of human responses to garner insight into one’s object relational world:

There is reason to believe that a person’s fund of internalized images of others, that is, of human ‘object-representations,’ and the feelings tied up in these images, bear the imprint of his formative interpersonal history, and reveal something of his ingrained relationship predispositions.
In addition to offering a novel theoretical approach to Rorschach analysis, Mayman substantiated his claims by demonstrating a significant correlation between the quality of human responses and clinical ratings of psychopathology (Mayman, 1967).

Mayman was also involved developing the first reliable measure of OR for the Rorschach (Krohn & Mayman, 1974), which was originally designed for dream analysis, but later adapted for the Rorschach and used in subsequent research (Hymowitz, Hunt, Carr, Hurt, & Spear, 1983; Spear & Lapidus, 1981). However, the measure was surpassed soon thereafter by the Concept of the Object on the Rorschach Scale (COR; Blatt et al., 1976) and the Mutuality of Autonomy Scale (MOA; Urist, 1977; Urist & Shill, 1982). The COR has respectable psychometric properties and is well-validated for use in adults and adolescents populations (Blatt et al., 1976; Levy, Meehan, Auerbach, & Blatt, 2005; Ritzler, Zambianco, Harder, & Kaskey, 1980). The MOA is also a well-established measure, but is shown to be a valid research and clinical instrument for children as well as adults (Bombel, Mihura, & Meyer, 2009; Holaday & Sparks, 2001; P. M. Lerner, 1991).

Grounded upon different theoretic foundations, the MOA and COR scales assess related, but distinct constructs. Mutuality of Autonomy, a specific dimension of OR, measures the extent to which object representations are construed simultaneously as psychologically autonomous, yet capable of reciprocal interaction (Urist, 1977; Urist & Shill, 1982). The seven points of the scale represent a continuum of developmental OR stages, ranging from primary narcissism to mutual, empathic relatedness (see Methods Section for further detail). The COR scale, which is based on an integration of psychoanalytic ego psychology and the developmental theories of Werner (1948) and Piaget (1954), measures multiple cognitive and affective elements of OR. Human responses are rated for perceptual accuracy, and assessed along dimensions of differentiation—
the type of figure perceived (e.g. human, quasi-human, or human detail); articulation—the degree to which perceptual and functional attributes are ascribed (e.g. sex, age, size, clothing); and integration, which is rated on four sub-dimensions: (1) internality of motivation of action (i.e. unmotivated, reactive, and intentional); (2) integration of the object and its action (i.e. fused, incongruent, nonspecific, and congruent); (3) the nature, and (4) content of the integration of the interaction with another object (i.e. active-passive, active-reactive, active-active, and malevolent-benevolent).

Despite their different theoretical underpinnings and approaches to OR assessment, convergent validity between the two measures, both in relation to each other and to the SCORS, is supported by research (Ackerman, Hilsenroth, Clemence, Weatherill, & Fowler, 2001; Blatt et al., 1976; Blatt, Tuber, & Auerbach, 1990; Bombel et al., 2009; Hibbard et al., 1995; Holaday & Sparks, 2001; P. M. Lerner, 1991; Westen, 1995). A substantial body of research utilizing these measures confirms the robust relationship between OR disturbances and adult psychopathology that is documented in SCORS literature (Stuart et al., 1990; Westen, 1991; Westen, Ludolph, Lerner, et al., 1990). Numerous studies show that, in comparison to non-clinical controls, clinical samples evidence more pathological OR levels on the COR and MOA scales (Blatt et al., 1976; Goddard & Tuber, 1989; D. R. Johnson & Quinlan, 1993; J. F. Murray, 1985; Strauss & Ryan, 1987; Stuart et al., 1990). Further, significant OR impairments are reported for a broad range of psychological disorders, including schizophrenia (Berg et al., 1993; D. R. Johnson & Quinlan, 1993; Spear & Sugarman, 1984); opiate addiction (Blatt et al., 1984; Blatt & Berman, 1990); anorexia and bulimia (Fowler et al., 2002; Piran, 1988; Pugh, 1990; Strauss & Ryan, 1987); sexual perversions (Gerard, Jobes, Cimbolic, Ritzler, & Montana, 2003); Narcissistic, Antisocial, and Histrionic Personality Disorders (Blais et al., 1999); and Borderline Personality Disorder
The severity of personality pathology is also shown to predict the level of OR disturbance (Blais et al., 1999; Fowler et al., 2000; H. D. Lerner & St. Peter, 1984; Levy et al., 2005; Piran, 1988). For example, in a study comparing Rorschach responses of 15 borderline and 15 neurotic outpatients, and 21 borderline and 19 schizophrenic inpatients, less severe pathology predicted greater perceptual accuracy and higher developmental responses on the COR (H. D. Lerner & St. Peter, 1984). Similarly, in a sample of university clinical outpatients, the single most pathological MOA score correlated significantly with the number of borderline symptoms (Blais et al., 1999). Research also reveals more malevolent and inaccurate human representations on the COR for inpatient-, as compared to outpatient-borderlines (H. D. Lerner & St. Peter, 1984), and more pathological composite MOA scores for self-mutilating borderlines than non-self-mutilating borderlines (Fowler et al., 2000). Therefore, the severity of OR disturbance appears to correspond with levels of borderline symptomatology.

These findings support a developmental model of object relations that positions psychopathology along a continuum (i.e. psychotic to borderline to neurotic levels of personality organization), which correspond to relational disturbances incurred at particular developmental periods (Kernberg, 1966, 2001; Levy et al., 2005). The original COR study, a longitudinal investigation of clinical and nonclinical samples from early adolescence to young adulthood, further elucidates typical versus atypical trajectories of OR development (Blatt et al., 1976). For the 37 non-clinical participants, age-related increases in differentiation, articulation, and integration of human figures, along with decreases in partial figures, distortions, and inactive human figures were observed. These findings stand in contrast to a comparison clinical sample.

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22 Subjects in this study were followed over a twenty year period.
of 48 adolescent and adult inpatients, who produced more inaccurately perceived, distorted, and partial, human responses that were portrayed as inert or engaged in unmotivated, incongruent, nonspecific, and malevolent activity. Thus, whereas object representations increase in complexity, detail, and sophistication in typical development, they are stifled, distorted, and malevolent in atypical trajectories. Accordingly, psychotics/schizophrenics tend to generate developmentally lower and more pathological human representations than borderlines (Hymowitz et al., 1983; Spear & Lapidus, 1981; Spear & Sugarman, 1984), while neurotics (e.g. depressives and normal-controls) generally produce human responses that are more developmentally advanced and less pathological than borderlines and schizophrenics (H. D. Lerner & St. Peter, 1984; J. F. Murray, 1985; Stuart et al., 1990).

More general features of psychopathology have also been linked to OR disturbances. Several MOA studies yield significant associations with thought disturbance, reality testing, affect lability, and symptom severity (Berg et al., 1993; Blatt et al., 1990; Harder, Greenwald, Wechsler, & Ritzler, 1984). For example, J. F. Murray (1985) showed that more pathological MOA scores predicted more intense levels of aggression, poorer reality testing, and impaired boundary diffusion in a sample of male borderlines and transsexuals. In another study, impaired self-object differentiation significantly correlated with thought process disturbance (Berg et al., 1993). In a similar vein, Blatt et al. (1990) demonstrated that more pathological mean MOA scores predicted poorer reality testing, as well as severity of thought disorder, affective lability, and clinical symptoms. The trifecta of cognitive processing deficits, affect dysregulation, and pathological OR is particularly relevant to the current study’s investigation given the preponderant evidence of affect regulation and social interaction difficulties found among children with neurocognitive impairments (Abad et al., 2011; Anastopoulos et al., 2011; Botting

23 The clinical sample was matched for age with the nonclinical sample.
& Conti-Ramsden, 2000; Fujiki et al., 2002; Meehan et al., 2008b). Hence, attention and language deficits may similarly be bound to disturbances in emotional and object-relational development.

**MOA Assessment of Children.** Consistent with the general OR literature, poorer OR quality is implicated in a range of psychological disorders in children (Goddard & Tuber, 1989; Goldberg, 1987; Leifer, Shapiro, Martone, & Kassem, 1991; Steven Tuber, 1992). Research consistently shows that, in comparison to normal-control groups, clinical pediatric samples evidence more pathological MOA scores (Goddard & Tuber, 1989; Leifer et al., 1991; Steven Tuber, 1992; Steven Tuber & Coates, 1989). For example, Goddard and Tuber (1989) found that boys diagnosed with separation anxiety disorder (SAD) attained higher mean-MOA scores, generated more maladaptive and fewer adaptive object representations, as well as more thought-disordered responses\(^{24}\), than a nonclinical sample of boys.

The compounding effects of thought disorganization and OR disturbance on psychological development are further supported by Tuber (1983), who demonstrated their combined predictive power for future psychological adjustment. Using a retrospective approach, 70 children previously in a residential treatment facility were categorized into two groups based on subsequent re-hospitalization or avoidance of psychiatric services approximately 11.6 years post-discharge. Between-group comparisons of OR quality and thought organization at the time of admission to the residential treatment facility revealed that the single most pathological MOA score predicted subsequent re-hospitalization, whereas the single most adaptive score predicted avoidance of re-hospitalization. In conjunction with research by Harder et al. (1984), who also demonstrated the MOA scale’s value as a prognostic indicator of psychological outcomes, these findings support the significant influence of OR quality on psychosocial development.

\(^{24}\) Thought disorder was measured by the Rorschach Thought Disorder Scale (Blatt & Ritzler, 1974).
MOA studies also contribute to a more in-depth understanding of particular object relational paradigms associated with certain disorders. Two studies examining OR quality of boys with Gender Identity Disorder (GID) not only revealed more significant OR disturbances in comparison to a non-clinical control group (Steven Tuber & Coates, 1989), but also gleaning important insight into associated patterns of object representations (S. Coates & S. B. Tuber, 1988). A qualitative investigation of the Rorschach responses of GID boys revealed that a greater proportion of the mutual, benign MOA responses depicted females in interaction, whereas an astonishingly high proportion of the malevolent responses were fully- or quasi-human male. S. Coates and S. B. Tuber (1988) interpreted these findings as a reflection of GID boys’ tendency to idealize female figures and rebuff male-ness due to malevolent associations.

Children with experiences of relational trauma and sexual abuse also exhibit distinctive patterns of MOA scores. In comparing the Rorschach responses of African-American females with sexual abuse histories to a control sample of non-abused girls, Leifer et al. (1991) found greater OR disturbances in mean and frequency of pathological scores, which also were related to increased thought disturbance, impaired reality testing, sexual preoccupation, and stress. However, interestingly, the single most adaptive MOA score was equivalent across the two groups, suggesting a capacity to experience relationships as benevolent despite susceptibility to malevolent interpersonal perceptions. A parallel trend emerged in a study of 232 children and adolescents with complex abuse histories (Tiedemann-Fuller, 2008). Here, the most frequent response was in the cooperative-engagement mode of object relating, while the second, most frequent response was the most pathological MOA score, which represents malevolent destruction and engulfment in relational experiences. These findings reflect a latitude in the
range of interpersonal experiences that appears to be supported by defensive splitting and polarization of object representations.

The impact of loss on OR development has also been examined. Brown-Cheatham (1993) compared the OR quality of 40 father-absent minority children between the ages of 6 and 12. Children who experienced involuntary father-absence (e.g. death, incarceration, or hospitalization) exhibited less adaptive OR scores on the MOA in relation to children whose fathers left voluntarily and negotiated their departure (e.g. work-related or agreed-upon-separation). Additionally, despite the reasons for the father’s absence, sons whose fathers lived with them prior to their departure had significantly more maladaptive OR than sons whose fathers never lived with them, suggesting that the early loss objects has greater potential to adversely effect OR development than the absence of objects. This particular finding makes sense in light of research demonstrating the adaptive use of fantasy in OR development (P. J. Donahue & Tuber, 1993). In a sample of 46 minority homeless children, a stronger capacity to produce fantasy images on the Rorschach predicted more adaptive OR on the MOA, which indicates that nonexistent objects can be supplanted with fantasy objects more readily than lost objects. Thus, fantasy may cushion the impact of interpersonal loss and trauma, both of which are shown to encumber OR functioning.

The more direct effects of major stressors is also portrayed by S. B. Tuber, Frank, and Santostefano (1989), who showed that MOA scores fluctuate in accordance with time proximity to a stressful event. Rorschach responses of Caucasian boys (ages 7 to 10) scheduled to undergo a hernia operation (surgical group) were compared to a matched-control group across three concordant time intervals—one week prior to hospitalization, one day prior to surgery, and three weeks post-surgery. The control group’s mean MOA scores remained relatively stable across the
three time points. The scores of the surgical group were roughly equivalent to those of the non-surgical group at the initial and post-surgery assessments; however, on the day prior to surgery they produced significantly more malevolent OR in comparison to the control group and to their own MOA scores on the initial and post-surgical assessments. Further, greater malevolence was revealed post-surgery, albeit more attenuated than the day prior to surgery. Based on these findings, the authors speculated that, “With increased proximity to anxiety-generating surgery came a heightened expectation of danger in interaction. The projection of heightened malevolence may have worsened these subjects MOA score” (S. B. Tuber et al., 1989). These findings are particularly interesting because they demonstrate the extent to which interpersonal functioning can vary depending on the context. Thus, one caveat for interpreting the general research is that OR may not be as stable of a trait as the research suggests, especially for nonclinical populations.

Another potential limitation of OR research in nonclinical samples is conveyed by S. B. Tuber (1989), who identified pronounced gender variations in a sample of 40 preadolescents. Females generated significantly more adaptive and less pathological scores than males, as evidenced by the mean MOA score, the single highest and lowest scores, and the percentage of benevolent responses for females (78.1%) compared to males (27.13%). Tuber (1989), however, cautioned that the relatively small sample size may have influenced the results. Indeed, findings from a larger sample of 100 children (ages 6 to 12) suggest so, as no significant gender or age differences emerged (Cooper, 2003). In an attempt to generate normative data for the MOA, Cooper (2003) revealed an overall mean of 3.0, which falls in the benign range. The average number of scoreable responses was 5.6 per protocol; the mean score was 2.95; the single most pathological score was 4.8; and the single most adaptive score was 2.07. The most malevolent responses were generated in response to Card VI, and the most adaptive responses to Card II.

Females provided a greater number of scoreable responses.
Further, OR quality was unrelated to behavioral problems, which is likely due to the use of nonclinical sample of children who evidenced generally adaptive OR scores.

Research by Ryan, Avery, and Grolnick (1985), however, demonstrates that OR quality can be connected to several important facets of psychosocial adjustment in nonclinical populations. An exploration of the Rorschach responses of 60 urban elementary school children in relation to teacher ratings of their interpersonal functioning, academic grades, and perceptions of interpersonal control, revealed that children with less developed MOA scores were more likely to perceive either powerful others or unknown sources as controlling outcomes, particularly in social contexts. These children were also rated significantly lower on measures of social adjustment, attention, self-esteem, and working with others. The reverse was found for children with more mature OR, who received significantly higher ratings across all measures of psychosocial adjustment. Importantly, however, MOA scores were unrelated to the teachers’ ratings of intelligence and achievement, and to the students’ actual performance on standardized achievement and intelligence tests. The positive findings for the relationship between OR quality and attention is particularly relevant to the current investigation, which examines the reciprocal influence of attention and OR in a sample of children suspected to be at risk for ADHD.

**Attention, Language, and Object Relations.** There is a dearth of research on the impact of attention and language deficits on OR development. However, a related line of research on the role of attachment-based factors in the socio-emotional functioning of children with general learning disabilities (LD) yields findings that are germane to the current investigation. In comparison to school-aged children without diagnosed LD, the research consistently shows that LD children evidence higher rates of insecure and avoidant attachment and lower rates of secure attachment; they are more likely to have socio-emotional problems; and to display elevated
symptoms of internalizing and externalizing disorders (Al-Yagon, 2008, 2010, 2012; Al-Yagon & Mikulincer, 2004). One study even revealed that attachment style significantly mediated the relationship between LD and socio-emotional adjustment (Al-Yagon & Mikulincer, 2004). Given that attachment and OR are related constructs (Calabrese et al., 2005; Stein et al., 2011), these findings suggest that neurocognitive impairment may be linked to more tenuous internalized objects and views of relationships. However, the lack of specificity in types of LD obscure the particular influence of attention and language deficits on OR.

Research by Prieto (1998) similarly reveals a general, but somewhat ambiguous connection between cognitive functioning and OR. He divided a sample of gifted minority students into high- and low-disparity groups based on the level of discrepancy between their Verbal and Performance IQs on the Wechsler Intelligence Scale for Children (WISC-III). Though there were no significant differences for the mean-MOA score, the children with high discrepancies between verbal abilities and perceptual, attention, and working memory processes produced twice as many symbiotic level responses (MOA-3), reflecting a greater propensity to experience others through a lens of enmeshment. Based on these findings, Prieto concluded that while neither group produced pathological scores, students with a high disparity between Verbal and Performance indices have less access to full, complex experiences of others.

Although the finding that cognitive disparities bear some relationship to OR pertains to the current study’s reliance on discrepant language abilities to classify SLI, there are also a number of limitations that impede its relevance. First and foremost, cognitive discrepancies have drastically different implications for intellectually gifted children than for those who function in the average range (or lower) with a specific neurocognitive deficit. Gifted children not only possess a reservoir of cognitive resources that help offset any areas of relative weakness, but are
also more likely to be engaged with in such a way that confirms their intellectual worth and esteem. As such, they are less likely to encounter the same level of academic adversity, which can easily erode the sense of efficacy and self-esteem of children with learning disabilities.

Two additional studies inform the present study’s hypothesis that there will be observable differences in the quality of OR among children diagnosed with ADHD. Matesevac (1994) compared the object representations of 82 inner-city boys between the ages of 9 and 11 who were divided into impulsive, non-impulsive, and acting-out impulsive groups based on response times to a measure of impulsivity. The acting-out impulsive group was in a special education setting for aggressive and disruptive behavior, but was regarded as a nonclinical sample because they had never received a formal diagnosis. The impulsive and non-impulsive groups were in a regular classroom setting. In comparison to the impulsive and non-impulsive groups, the acting-out impulsive group exhibited less adaptive mean-MOA scores, a lower developmental ratio between the two most adaptive and three most pathological scores, and a greater proportion of responses in the maladaptive range. Though the children were not categorically an ADHD sample, impulsivity represents a hallmark feature of ADHD and, thus has implications for the current study.

Parallel findings were also revealed in another study examining the direct relationship between OR quality and Attention Deficit Disorder (ADD; Thomas, 1987; as cited in Tuber, 1992). In comparing the MOA scores of children with Attention Deficit Disorder (ADD), Borderline Personality Disorder (BPD), and a combination of both diagnoses, the ADD groups were found to exhibit a greater proportion of malevolent responses and a smaller proportion of adaptive responses than the BPD group. Furthermore, of the total response from the BPD group, 50% fell in the adaptive range and 30% fell in the malevolent range, whereas 56% were in the
malevolent range and 35% in the adaptive range for the ADD-only and ADD/BPD groups. These findings corroborate the results attained by Ryan et al. (1985), who demonstrated that more malevolent OR predicted lower teacher-ratings of attention. Rightfully so, Thomas asserted a need for more thorough investigations of the object relational experience of ADD rather than the exclusive focus on the neurological components (Thomas, 1987). This is precisely the aim of the present study, which will provide a more descriptive account of children’s OR profiles in relation to their attention and language functioning.

**Summary and Study Hypotheses**

The current study aims to conduct an in-depth analysis of the OR functioning of children identified as “at risk” for ADHD and SLI in order to understand the reciprocal influences of attention and language on object relational development. The Rorschach Mutuality of Autonomy Scale (MOA; Urist, 1977; Urist & Shill, 1982), and the adapted version for the Thematic Apperception Test (MOA-TAT) were used to assess OR. These two scales will be compared to one another in order to examine convergent validity, and will also examined in relation standardized assessments of language and attention.

**Hypothesis 1.** Each child’s summary scores on the MOA and adapted MOA-TAT scales will be correlated, and the distributions of summary scores on each scale will not be significantly different from one another.

**Hypothesis 2.** Language and attention symptomatology, as measured by the CELF-4 Core Language Index (CLI) and Attention Problems (AP) subscale of the Child Behavioral Checklist (CBCL), will be significantly correlated with more pathological summary scores on the MOA and MOA-TAT scales.
Hypothesis 3. Language symptomatology, as measured by the CELF-4 CLI, will be related to more pathological OR on the TAT (i.e. MOA-TAT scale) than the Rorschach (i.e. MOA scale).
Methods

Participants

The participants for this study are 47 children selected from a pre-existing data set compiled from a project at City College funded by the National Institute on Deafness and Communication Disorders (NICDC) to examine attention and language impairments in community children (Gomes et al., 2001). Children were referred to the NICDC study between February 2003 and July 2006 based on parent or teacher concerns regarding behavioral and/or reading problems. Children were excluded from the NICDC study, and thus the current one, if they had a chronic medical or neurological illness, tic disorder, a history of neurological problems; if they were prescribed systemic medication; or were diagnosed with schizophrenia, major affective disorder, autism, or pervasive developmental disorder. Children also needed to be enrolled in school, have normal hearing, normal or corrected vision, and pass a bilateral hearing screen in order to participate.

All eligible children were administered a targeted neuropsychological battery of intelligence, language, and attention measures; the Rorschach Inkblot Test; and Thematic Apperception Test (TAT). Because of the current study’s focus on object relations assessment, only children with completed Rorschach and TAT protocols were included. Intellectual disability was ruled out for all participants based on standardized measures of intelligence (APA, 2013).

Measures

The Wechsler Abbreviated Scale of Intelligence (WASI; D. Wechsler, 1999). The WASI is a norm-referenced test for individuals between 6 to 89 years old. It is comprised of four subtests that yield standard scores ($M = 100; SD = 15$) for Verbal IQ (VIQ), Performance IQ (PIQ), and a Full-Scale IQ (FSIQ). The VIQ and PIQ represent an individual’s ability to reason
with verbal and nonverbal information. The FIQ, which is derived from the sum of all four subtests, provides a general estimate of intellectual functioning. The WASI is shown to have respectable test-retest reliabilities in pediatric samples and is significantly correlated with performance on the Wechsler Intelligence Scale for Children – Third Edition (Slatter, 2001).

**The Child Behavioral Checklist (CBCL; Achenbach, 1991).** The CBCL is a widely-used rating scale of pediatric psychopathology that has been shown to have good reliability and validity in both clinical and non-clinical populations (Achenbach, Howell, Quay, & Conners, 1991; P. S. Jensen et al., 1996; Schmeck et al., 2001). A self-report measure for parents of children between the ages of four and 18, the CBCL is comprised of 112 behavioral items that are rated on a 3-point scale ranging from “not true” to “often true” of the child. Raw scores are continuous and can be transformed into standardized broad- and narrow-band T-scores.

This study utilized the ADHD and Attention Problem (AP) subscales of the CBCL. The AP scale in particular has been shown to have good diagnostic sensitivity for ADHD (Chen, Faraone, Biederman, & Tsuang, 1994; Derks, Hudziak, Dolan, Ferdinand, & Boomsma, 2006); good convergence with structured clinical interviews in an ADHD sample (Biederman et al., 1993); and its stability has been documented over a four-year period for a clinical ADHD youth sample (Biederman et al., 2001). For these reasons, the AP subscale was selected as the focal measure of attention in the current study’s investigation of its relationship to OR functioning. Achenbach and colleagues note that T-scores greater than 63 on broadband scales are generally indicative of problem behaviors, with 60–63 representing a borderline range, and T-scores greater than 70 on narrowband scales are generally indicative of problem behaviors (Achenbach & Rescorla, 2001).
The Clinical Evaluation of Language Fundamentals-4th Edition (CELF-4; Semel et al., 2003). The CELF-4 is a multi-faceted measure of language abilities for individuals between the ages of 5 through 21 that was constructed to determine the presence of a language disorder or delay. The Core Language Index (CLI), which represents general language ability, is derived from summing the scaled scores of subtests that best discriminate typical from disordered language performance. Receptive Language Index (RLI), which is comprised of listening and auditory comprehension subtests, is derived from summing the scaled scores from a combination of two or three receptive subtests, depending on the student’s age. The Expressive Language Index (ELI) represents an overall estimate of oral expression.

The CELF-4 is used extensively for evaluating language impairments in clinical and research settings and is considered to have good reliability and validity (Bishop, 1997; Semel et al., 1995). The CLI carries the following diagnostic sensitivity and specificity for students scoring -1, -1.5 and -2 standard deviations below the mean, and was therefore selected as the focal measure of language ability, which was examined in relation to OR functioning. The sensitivity, or percentage of children classified as having a language disorder who will test positive for the language disorder, is 1.0, 1.0, and .87, respectively. The specificity, or the percentage of children without a language disorder who will test negative for a language disorder, is .82, .89 and .96, respectively.

The Rorschach Inkblot Test. The Rorschach Inkblot Test has a rich history within the psychoanalytic tradition. Hermann Rorschach, who passed away shortly after the publication of his first and only manuscript, Psychodiagnostik, developed the test to assess perceptual and psychological processes (Rorschach, 1921). Despite his early passing, his premise that aspects of
the human psyche can be gleaned through how one organizes and structures percepts on the inkblot, endures as the basis of Rorschach theory.

Frank (1939), who introduced the “projective hypothesis,” classified the Rorschach as a projective test, explaining that it induces the respondent, “To reveal his way of organizing experience by giving him a field (object, materials, experiences) with relatively little structure and cultural patterning, so that the personality can project upon that plastic field his idiomatic, idiosyncratic personality.” In this way, projective tests provide a psychological picture of an individual by accessing deeper layers of personality structure and the complexities of personality dynamics.

The Rorschach is a set of 10 inkblots that have unique features in terms of design, color, shading, and texture. It is administered in two phases. In the initial response phase, respondents are presented with each individual card and asked to state what they see. In the inquiry phase they are asked to describe and clarify the determinants of their responses. The methods for scoring and interpreting the Rorschach have been multifarious and, as a result, controversial. By 1957, five scoring systems with diverse theoretical underpinnings existed. The absence of a unified scoring system generated confusion and ambiguity with respect to Rorschach interpretation and, consequently, cast doubt on its utility as a psychological instrument. The Rorschach continues to be subjected to criticism related to its psychometric properties, methodological flaws and questionable empirical basis for interpretations, and the lack of standardized administration and scoring procedures (Davis, 2001). Its re-designation as the Rorschach Inkblot Method (RIM), as opposed to test, was an attempt to assuage methodological concerns and preserve respect for the instrument (Weiner, 1994).

**Thematic Apperception Test (TAT; Morgan & Murray, 1935).** The TAT is a series of black-and-white pictures depicting ambiguous and evocative character scenes. For each card the respondent generates a narrative that includes the following components: (1) what is happening in the picture; (2) what led up to the present situation; (3) what are the characters thinking; (4) how are the characters feeling; (5) what will happen in the future. The participants in this study were presented with eight TAT cards: 1, 2, 3BM, 4, 7GF, 8BM, 12M and 13B.

The fundamental assumption of the TAT is that the narratives constructed in response to these complex, ambiguous character scenes yield insight about an individual’s personality dynamics (H. A. Murray, 1938). Murray created a highly intricate scoring system\(^{26}\) that is seldom used that is not conducive to systematic quantification of results. A plethora of scoring systems are currently in existence for the TAT as a result of its widespread use in personality research and clinical assessment. However, in contrast to personality researchers, who are partial to well-defined constructs for personality assessment (Smith, 1992), clinicians typically prefer to use the TAT as a flexible tool to elicit information based on their own expertise and theoretical understanding of personality dynamics. In fact, many clinicians oppose a scoring system, arguing

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\(^{26}\) Murray’s need-press system, which is based on his theory of Personology, encompasses 29 needs (forces or motivational drives of the protagonist), 20 presses (environmental forces or situations affecting the expression of needs), and their potential interaction with one another.
instead that the TAT needs to be interpreted, not scored (Gieser & Stein, 1999), to allow for a unique picture of the whole person to emerge.

Thus, despite the fact that the TAT is one of the most widely used clinical instruments (Archer, Maruish, Imhof, & Piotrowski, 1991; C. E. Watkins, Campbell, Nieberding, & Hallmark, 1995), and coding procedures with sound psychometric properties do exist (Cramer, 1999; Jenkins, 2008; Teglasi, 1993; Westen, 1991; Westen et al., 1985), there is no consensus on any single scoring system or comprehensive set of norms (Teglasi, 2010).

**The Mutuality of Autonomy (MOA) Scale (Urist, 1977; Urist & Shill, 1982).** The MOA Scale is an assessment of the developmental maturity of object relations (OR). Inspired by the theories of Kernberg (1966, 1985) and Kohut (1966; Kohut & Wolf, 1978), the measure is constructed on the premise that individuals represent and construe self-other relationships in a consistent, enduring manner. A specific dimension of OR, Mutuality of Autonomy is defined as (Urist & Shill, 1982):

> The degree to which people in relationships are conceived of, by the subject, as psychologically autonomous; as possessing an enduring, inherent psychic existence. The subject experiences others as possessing a self, while at the same time objectively recognizes his or her own existence as one object among many. Both self and others are simultaneously experienced by the subject as possessing an identity, a will, and the subjective, affective experience of selfhood.

Although the original MOA studies utilized the scale to assess OR consistency across various clinical measures, its subsequent use has been almost exclusively for the Rorschach to assess thematic content of stated or implied relationships between human, animal, and inanimate movement responses.
The seven-point ordinal scale represents the developmental progression of separation-individuation, while also capturing the degree of malevolent control and destructiveness perceived in imbalanced object relations. A description of each of the scale points, as outlined by S. Coates and S. B. Tuber (1988), is provided herein.

MOA scale points 1 and 2 are the most adaptive scores, representing the capacity to construe self- and other representations as differentiated and engaged in mutually interactive or parallel activity (e.g., two bears clapping hands). MOA1 is scored when interactions between figures are depicted in such a way that suggests a high degree of autonomous functioning and reciprocal acknowledgement of their respective individuality. MOA2 is scored when figures are engaged in parallel activity or a relationship in which there is no stated emphasis on mutuality.

Scale points 3 and 4 capture dependent and mirroring object relationships and typically reveal an emerging loss of autonomy in the interaction between figures (Coates & Tuber, 1989). MOA3 is scored when there is clearly a dependent relationship in which the maintenance of the self is tied to the existence of an external source of support. Figures described as, leaning, hanging, catching, or holding typically connote the need for dependence and reliance on another. MOA4 is scored when the relationship conveys a sense that the definition or stability of one object necessarily requires the other because of it is merely an extension or reflection of the other.

Scale points 5, 6, and 7 not only reflect the loss of the capacity for separateness, but also increasing malevolence (Coates & Tuber, 1989). MOA 5 is scored when relationships are characterized by significant imbalances of mutuality, whereby one figure is omnipotent and controlling over another figure depicted as powerless and helpless. Themes of manipulation, coercion, one-sided fighting, or hurtful influence are also subsumed under MOA5. MOA6 is
scored when the mutuality of relations is described in “decidedly destructive” or parasitic terms, and the autonomy or integrity of the victim is compromised (e.g. “Two witches who shot each other” on Card IX). MOA7 is the most pathological score that is given when there are themes of total destruction, envelopment, and contamination that exist in such a way that are completely beyond the control of the figure, leaving the figure helpless and powerless.

Validity and Reliability. The MOA Scale has respectable psychometric properties and is considered a valid assessment of OR (Bombel et al., 2009; Graceffo, Mihura, & Meyer, 2014; Holaday & Sparks, 2001; Monroe, Diener, Fowler, Sexton, & Hilsenroth, 2013). Earlier studies predominantly used the MOA in adult clinical samples, but the measure has since been established for clinical and nonclinical populations of children and adults (Steven Tuber, 1992). Convergent validity with other OR measures is supported (Ackerman et al., 2001; Blatt et al., 1990; Hibbard et al., 1995), and discriminant validity between OR quality and IQ is consistently demonstrated (Blatt et al., 1990; Harder et al., 1984; Ryan et al., 1985; S. B. Tuber, 1989).

Inter-rater reliability has significantly improved since earlier MOA studies, with more recent research demonstrating strong reliability (Bombel et al., 2009; S. B. Tuber, 1989). Bombel et al. (2009) conducted a meta-analysis using 31 independent data sets from 35 studies, which revealed excellent reliability at the response level ($K = .82$) and protocol level ($ICC = .90$). Even raters naïve to OR theory are able to achieve an exact agreement rate of 80% (Holaday & Sparks, 2001). Therefore, with appropriate training, raters are able to score the MOA with a high degree of reliability.

There is some dissention in the literature about the construct validity of the MOA. Despite the substantial evidence to support that the MOA Scale does in fact measure OR, some researchers note that at the pathological end of the scale it can be difficult to distinguish OR
quality from pathological functioning (Berg et al., 1993; Blatt et al., 1990). An examination of the construct validity revealed that while the MOA Scale is an equally potent measure of OR quality and psychopathology, it does not cleanly discriminate between the two constructs (Bombel et al., 2009). However, while the overlap raises justified questions with regard to construct validity, authors contend that it is consistent with the theoretical foundation upon which it rests, namely that OR maturity corresponds with the level of psychological functioning.

**Calculating and Summarizing MOA Data.** A number of calculation procedures exist for deriving MOA summary scores. Given that each scale point on the MOA corresponds to a different theoretical stage of development, the method of calculation has major implications for how the data are interpreted. The total number of MOA responses (MOA-R) is generally computed for each protocol. There are different opinions regarding the number of MOA scores that can be assigned to each response. Some coding procedures specify that when there is the potential for two scores to be assigned to a response, the more maladaptive score is always given (Hilsenroth & Charnas, 2007). Others maintain that multiple scores can be assigned to any given response (S. Tuber, personal communication, January 17, 2013), which is the method employed by the current study to capture a broader range of the child’s OR functioning.

The mean (MOA-Mean), which represents the individual's typical quality of interpersonal relatedness, is considered the most robust and is most frequently used in MOA research (Fowler & Erdberg, 2005; Graceffo et al., 2014). Nevertheless, even though the MOA-Mean is useful for capturing the modal object-relational quality (S. B. Tuber, 1989), it fails to consider an individual’s range of interpersonal functioning. For example, an individual with scores that fall predominantly in the 3-4 range is clinically different from an individual with a bi-modal distribution of 2 and 6, even though both could have a mean of MOA3. Therefore, despite it
being the most commonly used procedure, there are significant limitations to solely relying on the mean-MOA for interpreting the data.

Several procedures exist to represent a range of object-relational functioning, though they are more frequently used for protocols of individuals with Borderline Personality Disorder (Fowler & Erdberg, 2005). The single most adaptive score (Highest Object Relations Score - HORS) and the single most pathological score (Lowest Object Relations Score - LORS) can be used to represent the highest level of adaptation possible, in conjunction with the disturbed level of relational functioning. A high prevalence of MOA7 represents a heightened vulnerability to losing the capacity to differentiate self from other in stressful contexts, and may indicate an underlying psychotic process (Fowler & Erdberg, 2005). The range between the HORS and LORS is infrequently used, but serves as an indicator of the range of interpersonal functioning.

An additional summary score is the pathological score (MOA-PATH; Berg et al., 1993), which is the total number of 5, 6, and 7 scores that occur on a given protocol. An MOA-PATH score above 2 provides clinical indication of an individual’s vulnerability to become involved in turbulent interpersonal interactions characterized by vigilance and fear of being controlled and coerced by the other (Fowler & Erdberg, 2005). Similarly, the frequency of MOA1 and MOA2, as well as MOA3 and MOA4, scores can also be accounted for by MOA-Benevolent and MOA-Narcissistic scores. The raw sum of MOA scores found in a protocol (MOA-Sum) is not typically used, but is another option for summarizing MOA data.

The following summary scores will be used in the present study:

1. Each child’s total number of MOA responses (MOA-R).
2. The mean OR score for each child’s protocol (MOA-Mean).
3. The modal OR score for each child’s protocol (MOA-Mode).
4. Each child’s most adaptive MOA score (LORS).

5. Each child’s most pathological MOA score (HORS).

6. The number of responses assigned scores 5, 6, or 7 (MOA-PATH).

**Mutuality of Autonomy Scale for the TAT (MOA-TAT).** This is the first study to adapt the MOA to the TAT. Though this has never been done before, the OR assessment literature is rife with examples of successful adaptations from one medium to another (Krohn & Mayman, 1974; Segal et al., 1992; Spear & Lapidus, 1981). Even the original MOA research applied the scale to autobiographical descriptions of patients’ relationships, a task based on the work of Henry Murray (1938); staff ratings of patients’ interpersonal behavior on the ward; clinical charts; and therapist ratings of patients (Urist, 1977; Urist & Shill, 1982). In contrast to the SCORS (Westen et al., 1985), the standard OR measure for the TAT, is not well-validated in pediatric samples and is purported to be especially limited for children with learning disabilities (Freedenfeld et al., 1995; Ornduff & Kelsey, 1996; Westen, Ludolph, Block, et al., 1990), the MOA scale is a well-established, implicit measure of children’s OR, necessary features given that the particular characteristics of the study sample (Fowler & Erdberg, 2005; Steven Tuber, 1992).

This author attempted retain as much of the original MOA scale as possible in its adaptation to the TAT. The most radical modifications were made to scale point 4. Instead of reflection and mirror responses, which do not readily translate to the TAT, scale point 4 on the MOA-TAT aimed to capture a fundamental failure in self-other differentiation (Refer to Appendix I for complete MOA-TAT coding manual):

“The described relationship conveys a sense that the definition or stability of one character necessarily requires the other because it is merely an extension or
reflection of the self. Some degree of fusion or lack of self-other differentiation between characters is central here. Characters are described as mirror-objects or are ascribed the exact same thoughts, feelings, and behaviors…. Individual experiences of the characters are merged in such a way that diminishes their respective sense of individuality.”

Scale points 5 and 6 were generally maintained. However, because themes of loss and abandonment are commonly expressed on the TAT, which generally reflect some level of relational imbalance and distress, such themes were added as a dimension of level 5 and 6 responses. In-depth descriptions of these added dimensions are included in the MOA-TAT Coding Manual (Appendix I).

**Procedures**

As part of the larger NIDCD-funded project, children underwent a two-day targeted neuropsychological assessment battery of language, attention, reading, and intelligence tests. All testing took place in a small, quiet room. The Rorschach and TAT were typically administered toward the end of the second day of testing. Responses to the projective tests were transcribed and tape-recorded for confirmation of written transcription.

While the children were being evaluated, the biological/adoptive parents or legal guardians were interviewed and asked to complete a history form and various rating scales. After all the information was compiled, each child’s family was provided with feedback and a written clinical report of the evaluation results.

The Rorschach and TAT protocols for this study were coded by this author and another advanced doctoral student. Both raters were unaware of patient diagnosis, all other test data, and the other rater’s scoring. 20 Rorschach and 20 TAT protocols were selected at random to
establish inter-rater agreement. Items for which there was disagreement between raters were independently coded by Dr. Steven Tuber, Ph.D., a leading expert on the MOA Scale (see S. Coates & S. B. Tuber, 1988; Steven Tuber, 1992). Dr. Tuber’s ratings for the disagreed items were used in the statistical analyses.

**Hypotheses**

The aim and focus of the study is to conduct an in-depth analysis of the object relational functioning of children identified as “at risk” for ADHD and SLI in order to understand the reciprocal influences of attention and language on object relational development. The Rorschach Mutuality of Autonomy Scale (MOA; Urist, 1977; Urist & Shill, 1982) and adapted version for the TAT (MOA-TAT) are used to assess OR quality. The two scales will be compared to one another in order to examine convergent validity, and will also examined in relation to standardized assessments of language and attention.

**Hypothesis 1.** Each child’s summary scores on the MOA and adapted MOA-TAT scales will be significantly correlated, and the distributions of summary scores on each scale will not be significantly different from one another.

**Hypothesis 2.** Language and attention symptomatology, as measured by the CELF-4 Core Language Index (CLI) and Attention Problems (AP) subscale of the Child Behavioral Checklist (CBCL), will be significantly correlated with more pathological summary scores on the MOA and MOA-TAT scales.

**Hypothesis 3.** Language symptomatology, as measured by the CELF-4 CLI, will be related to more pathological OR, as measured by the MOA and MOA-TAT scales, on the TAT that the Rorschach.
Data Analysis

Scoring Procedures

The instruments administered to the children, parents, and teachers, including the WASI, CELF, ADHD-IV, and CBCL were scored using standard procedures. The MOA and adapted MOA-TAT scales were applied to the children’s Rorschach and TAT protocols in order to assess OR quality. The complete manual for the MOA-TAT is detailed in Appendix I.
Results

The focus of the study was to examine the reciprocal influence of attention and language on object relational development in a sample of children identified as at-risk for ADHD and SLI. Object relations (OR) was measured by the Rorschach MOA scale (Urist, 1977; Urist & Shill, 1982), which was adapted for the TAT (MOA-TAT) in order to examine differences in OR quality on the Rorschach in comparison to the TAT, particularly with respect to language functioning. Given the existing literature, it was hypothesized that the MOA and MOA-TAT scales would converge in their measurement of OR, and that language and attention symptomatology would be significantly correlated with more pathological OR on both scales. A different pattern, however, was hypothesized for children with clinically significant language impairment, who were expected to evidence more pathological OR on the MOA-TAT due to the greater language demands involved in the TAT.

The results sections begins with an overview of the demographic and background characteristics of the study participants, followed by the sample’s performance on measures of intelligence, language, and attention. The focal measures of language and attention are then discussed in terms of their relationship to demographic and background data, followed by an overview of the general sample’s performance on the MOA and MOA-TAT, which are also examined in relation to demographic and background data.

The statistical analyses used to investigate this study’s three main hypotheses are then addressed. First, the MOA and MOA-TAT data are examined in relation to one another in order to explore reliability and convergent validity. Subsequently, language and attention severity are investigated in relation to MOA and MOA-TAT variables in order to examine their influence on object relational development. Finally, language severity is examined in relation to potential
differences in OR quality on the Rorschach (MOA) versus TAT (MOA-TAT). Concluding the results section is an ancillary analysis that is a purely exploratory investigation of the potential utility of a scale-point 8 on the MOA-TAT to represent absences of OR scores.

**Preliminary Analyses**

**Demographic Characteristics**

The demographic characteristics of the 47 children in the study sample are displayed in Table 1. All children were between the ages of 7 and 10 years old ($M = 8.42; SD = .79$). Consistent with epidemiological statistics on the prevalence of ADHD and SLI (APA, 2013; Carlson et al., 1997; La Paro et al., 2004; Nussbaum, 2012), the sample is predominantly male (n = 32, 67.4%). According to parent-report of children’s race/ethnicity, the vast majority of participants were identified as African-American (57.5%) and Latino/Hispanic (37.2%). Five of the children were identified as Caucasian (11.6%) and 1 as Asian (2.3%). 13 children (30.2%) were reported to be from bilingual households; however, all children were fluent in English and enrolled in English-only classrooms.

| Table 1 |
|-----------------|-----------------|-----------------|
| **Demographic Characteristics of Participants** | **All Participants** | **Male** | **Female** |
| | (N=47) | (n=32; 67.4%) | (n=15; 32.6%) |
| Mean Age (Std Dev.) | 8.4 (.79) | 8.38 (.81) | 8.51 (.77) |
| **Race/Ethnicity** | | | |
| African American | 21 (57%) | 13 (30.2%) | 8 (18.6%) |
| Latino/Hispanic | 15 (37.2%) | 10 (23.3%) | 6 (14%) |
| Caucasian | 5 (11.5%) | 5 (11.6%) | 0 (0%) |
| Asian | 1 (2.3%) | 1 (2.3%) | 0 (0%) |
| Bilingual | 13 (30.2%) | 9 (20.9%) | 4 (9.3%) |
Performance on Intelligence, Language, and Attention Measures

All children were administered standardized measures of intelligence, attention, and language. Table 2 reports the means, standard deviations, and ranges for the total sample’s performance on the Wechsler Abbreviated Intelligence Scale (WASI), Clinical Evaluation of Language Fundamentals-4th Edition (CELF-4), and ADHD and Attention Problems (AP) subscales of the Child Behavioral Checklist (CBCL). All participants’ WASI scores were available. CELF-4 data was missing for one child (.02%) and CBCL data for three participants (.06%). There were no statistically significant gender-related differences on any of these measures\textsuperscript{27}.

As a whole, the sample demonstrated average verbal and nonverbal intelligence (WASI: FSIQ $M = 95.57$; VIQ $M = 94.09$; PIQ $M = 97.79$), with considerable variability among participants’ scores, which ranged from the “Borderline” to “Very Superior” range ($\text{Min.} – \text{Max. Std. Scores}: 76-116$). On the CELF-4, the expressive, receptive, and global language indices ranged from the cusp of average to average (Expressive Language Index—ELI: $M = 89.5$, $SD = 18.86$; Receptive Language Index—RLI: $M = 92.45$, $SD = 17.25$; Core Language Index—CLI: $M = 89.35$, $SD = 15.16$). Nevertheless, the mean CLI score is approximately two-thirds of a standard deviation below normative expectations ($M=100$, $SD = 15$), which is notable given the CLI’s strong diagnostic sensitivity and specificity for scores one standard deviation below the mean (i.e. Standard Score <85). Similarly, the sample’s mean scores on the CBCL ADHD ($M = 59.43$; $SD = 7.18$) and AP subscales ($M = 62.07$; $SD = 8.2$) are approximately one standard deviation above normative expectations (i.e. T-Score > 60), which represents borderline range ADHD symptomatology. Therefore, the sample is representative of a mild language and

\textsuperscript{27} A one-way ANOVA revealed no statistically significant gender differences for the WASI FIQ ($F = .006$, $p = .937$), and VIQ ($F = .59$, $p = .45$), PIQ ($F = .59$, $p = .45$); CELF-4 CLI ($F = .16$, $p = .7$), RLI ($F = .002$, $p = .96$), and ELI ($F = 1.24$, $p = .27$); or the CBCL ADHD ($F = 2.26$, $p = .14$) and AP ($F = .79$, $p = .38$) subscales.
attention impairment population, which is expected given the original NIDCD study’s recruitment of children with reading and behavioral difficulties (Gomes et al., 2001).

Table 2

Sample’s Performance on Intelligence, Language, and Attention Measures

<table>
<thead>
<tr>
<th></th>
<th>All Participants (N=47)</th>
<th>Male (n=32; 67.4%)</th>
<th>Female (n=15; 32.6%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intelligence (WASI)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FSIQ: Mean (SD)</td>
<td>95.57 (13.19)</td>
<td>95.47 (14.6)</td>
<td>95.8 (9.96)</td>
</tr>
<tr>
<td>Range</td>
<td>74-133</td>
<td>74-133</td>
<td>79-107</td>
</tr>
<tr>
<td>VIQ: Mean (SD)</td>
<td>94.09 (12.27)</td>
<td>95.03 (13.2)</td>
<td>92.07 (10.14)</td>
</tr>
<tr>
<td>Range</td>
<td>73-134</td>
<td>73-134</td>
<td>76-112</td>
</tr>
<tr>
<td>PIQ: Mean (SD)</td>
<td>97.79 (13.48)</td>
<td>96.75 (14.63)</td>
<td>100 (10.76)</td>
</tr>
<tr>
<td>Range</td>
<td>74-131</td>
<td>74-131</td>
<td>79-116</td>
</tr>
<tr>
<td><strong>Language (CELF-4)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLI: Mean (SD)</td>
<td>89.35 (15.16)</td>
<td>89.94 (16.03)</td>
<td>88 (13.42)</td>
</tr>
<tr>
<td>Range</td>
<td>50-133</td>
<td>50-133</td>
<td>68-108</td>
</tr>
<tr>
<td>RLI: Mean (SD)</td>
<td>92.45 (17.25)</td>
<td>92.53 (19.12)</td>
<td>92.27 (12.8)</td>
</tr>
<tr>
<td>Range</td>
<td>50-143</td>
<td>50-143</td>
<td>75-116</td>
</tr>
<tr>
<td>ELI: Mean (SD)</td>
<td>89.50 (13.86)</td>
<td>91 (14.10)</td>
<td>86.07 (13.12)</td>
</tr>
<tr>
<td>Range</td>
<td>50-120</td>
<td>50-120</td>
<td>6-106</td>
</tr>
<tr>
<td><strong>Attention (CBCL)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADHD: Mean (SD)</td>
<td>59.43 (7.18)</td>
<td>60.59 (7.61)</td>
<td>57.2 (5.88)</td>
</tr>
<tr>
<td>Range</td>
<td>50-74</td>
<td>50-74</td>
<td>50-66</td>
</tr>
<tr>
<td>AP: Mean (SD)</td>
<td>62.07 (8.2)</td>
<td>62.86 (8.83)</td>
<td>60.53 (6.84)</td>
</tr>
<tr>
<td>Range</td>
<td>50-87</td>
<td>50-87</td>
<td>50-70</td>
</tr>
</tbody>
</table>

**Focal Measures of Language and Attention**

The CELF-4 Core Language Index (CLI) and CBCL Attention Problems (AP) subscale were selected as focal measures of attention and language because of their well-established diagnostic sensitivity for deviant language and attention processes (Derks et al., 2006; Semel et al., 2003). Pearson’s correlations analyses confirmed that these focal measures were significantly related to other facets of language and attention assessed as part of the current study. There was a very robust associations between the CBCL AP and ADHD subscales (r = .81, p = .00), and for
the CLI in relation to the receptive and expressive language indices of the CELF-4 (RLI: r = .87, p = .00; ELI: r = .93, p = .00). Furthermore, the CBCL-AP and CLI were unrelated (r = -.21, p = .17), supporting their identity as separate constructs and measures.

Using Pearson’s correlations, demographic and background variables were examined in relation to language and attention measures in order to investigate the potential effects of sample characteristics. Age, gender, and bilingual status were shown to be unrelated to language ability (Age: r = -.05, p = .73; Gender: r = -.06, p = .70; Bilingual: r = -.28, p = .07), and attention problems (Age: r = .09, p = .56; Gender: r = -.14, p = .38; Bilingual: r = -.02, p = .89). Pairwise comparisons were conducted in order to examine the effects of race/ethnicity. Because there was only one Asian participant whose scores represented a major outlier, this participant was removed from the analysis. Results revealed that race/ethnicity was not significantly related to AP scores on the CBCL (F = .99, p = .39), but was significantly related to the CLI (F = 4.64, p = .02). The mean CLI score of the Caucasian participants (M = 107.8, SD = 5.92) was significantly higher than African-American (M = 89.89; SD = 3.12) and Latino/Hispanic participants (M = 87.5; SD = 3.31).

WASI Full-Scale IQ scores were significantly associated with language ability on the CLI (WASI FIQ: r = .54, p = .00, PIQ: r = .53, p = .00, VIQ: r = .54, p = .00), but not with Attention Problems on the CBCL (WASI FIQ: -.08, p = .63, PIQ r = -.11, p = .46; VIQ: r = .00, p = .99). These findings are consistent with the literature, which reports similar magnitudes for IQ in relation to the language ability on the CELF-4, and weak to modest relationships between IQ and attention problems (Jepsen, Fagerlund, & Mortensen, 2008; Wechsler et al., 2004).
Object Relations Assessment

Inter-Rater Agreement

Rorschach and TAT protocols were scored on the Mutuality of Autonomy (MOA) and adapted MOA-TAT scales by this author and another advanced doctoral student, both of whom were aware of the study hypotheses, but unaware of patient diagnosis, all other test data, and the other rater’s scoring. 20 Rorschach and 20 TAT protocols were selected at random to calculate inter-rater agreement by using the overall correct classification formula (Kessel & Zimmerman, 1993), which assesses how frequently raters agreed across the entire MOA scale (scale points 1 through 7), rather than a single (or average) MOA score. Inter-rater agreement was found to be excellent for both the Rorschach MOA (ICC = .89) and for the MOA-TAT (.86). This particular finding provides the first evidence for the MOA-TAT’s strong reliability potential.

Performance on MOA and MOA-TAT Scales

The MOA and MOA-TAT scales were used to determine each child’s OR quality. Herein, a general overview of the frequencies and percentages of each response level on the MOA and MOA-TAT scales is provided, along with t-test comparisons to examine whether there are any statistically significant frequency differences between the two scales. A breakdown of the mean, modal, ranges, and response-level frequencies is also provided for each individual Rorschach and TAT card. MOA and MOA-TAT summary scores are also reported for the entire sample, followed by an analysis of the demographic characteristics in relation to each of the summary scores.

Response Level Frequencies. The frequencies and percentages of each response level (MOA1-7) are shown in Table 3. As expected, children generated a greater number of scoreable OR responses on the TAT, which depicts character scenes that prime for OR more readily than
the ambiguous Rorschach inkblots. The range of MOA and MOA-TAT scores spanned the entire 7-points of the scale, but there were very few level 7 responses (i.e. one MOA-7 and two MOA-TAT-7). In general, the MOA-TAT appeared to have a more adaptive skew than the MOA scale. Although approximately one third of the responses fell in the benign range (Level 1 and 2) for both scales, the frequency and total percentage of Level 2 responses on the MOA-TAT (34.02%) was significantly higher (i.e. nearly double) than that of the MOA scale (18.26%; t = -3.5, p = .00). On the pathological end of the scale, the percentage of Level 5 responses was considerably higher on the MOA (28.22%) than the MOA-TAT (18.48%), but this difference did not reach statistical significance (t = .58, p = .57). Level 6 and 7 responses were more equally distributed (MOA6+7 = 20.75%; MOAT6+7 = 16.63%). The extremely low frequency of Level 7 responses reflects relatively low severity of psychopathology in the sample (Fowler & Erdberg, 2005).

Table 3
Response Level Frequencies for the MOA and MOA-TAT

<table>
<thead>
<tr>
<th>Scale Point</th>
<th>MOA Scale (n = 241)</th>
<th>MOA-TAT Scale (n = 341)</th>
<th>Paired Samples (T-Test, P-Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>30 (12.45%)</td>
<td>16 (4.69%)</td>
<td>t = .46, p = .67</td>
</tr>
<tr>
<td>Level 2</td>
<td>44 (18.26%)</td>
<td>116 (34.02%)</td>
<td>t = -3.5, p = .00</td>
</tr>
<tr>
<td>Level 3</td>
<td>29 (12.03%)</td>
<td>76 (22.29%)</td>
<td>t = -1.78, p = .1</td>
</tr>
<tr>
<td>Level 4</td>
<td>20 (8.3%)</td>
<td>15 (4.4%)</td>
<td>t = .27, p = .8</td>
</tr>
<tr>
<td>Level 5</td>
<td>68 (28.22%)</td>
<td>63 (18.48%)</td>
<td>t = .58, p = .57</td>
</tr>
<tr>
<td>Level 6</td>
<td>49 (20.33%)</td>
<td>53 (15.54%)</td>
<td>t = .65, p = .53</td>
</tr>
<tr>
<td>Level 7</td>
<td>1 (.42%)</td>
<td>2 (.59%)</td>
<td>N/A28</td>
</tr>
</tbody>
</table>

MOA and MOA-TAT Responses by Card. The means, standard deviations, ranges, modes, and frequencies of response levels were calculated for each, individual Rorschach and TAT card. For the Rorschach, children generated the most scoreable OR responses on Card III (n = 39), Card VIII (n = 35), and Card X (n = 34), and the fewest on Card IV (n = 15) and Card V.

28 There was an insufficient number of Level 7 responses to compare mean differences.
The broadest range of MOA scores was evidenced on Card III (Min. = 1; Max. = 7), and the narrowest range on Card I (Min. = 3; Max. = 6). Rorschach Cards I (M = 4.85), IV (M = 4.73), and Card IX (M = 4.05) elicited the most pathological MOA-mean scores. The most pathological modal scores emerged on Card II (Mode = 6) and Card IX (Mode = 6). The most adaptive mean and modal scores were evidenced on Card VII (M = 2.6; Mode = 1).

For the TAT, children produced the most OR responses on Card 8BM (n = 55) and 12M (n = 52), and the fewest on Card 1 (n = 21) and Card 2 (n = 29). The range of responses was broadest for Card 12M (MOA-TAT 1-7) and narrowest for Card 1 (MOA-TAT 1-5). The most pathological mean and modal MOA-TAT scores were evidenced on Card 3BM (M = 4.06, Mode = 6) and Card 8BM (M = 4.44, Mode = 6), and the most benign on Card 1 (M = 2.67, Mode = 2), Card 2 (M = 2.66, Mode = 2), and Card 7GF (M = 2.91, Mode = 2). The descriptive statistics for each individual Rorschach and TAT card are shown in Tables 4 and 5.

**MOA and MOA-TAT Summary Scores.** Table 6 displays the MOA and MOA-TAT summary scores, including the total sample’s average number of scoreable OR responses on the Rorschach and TAT (MOA-R; MOA-TAT-R); mean OR score (MOA-M; MOA-TAT-M), modal OR score (MOA-Mode; MOA-TAT-Mode); single most adaptive OR response (MOA-LORS; MOA-TAT-LORS); single most pathological OR response (MOA-HORS; MOA-TAT-HORS), and the total frequency of pathological responses (MOA-PATH; MOA-TAT-PATH). Again, the average number of OR responses was higher for the TAT (MOA-TAT: M = 7.4) than the Rorschach (MOA: M = 5.18). The MOA and MOA-TAT summary scores are compared and further discussed as part of the investigation of the first hypothesis, which aims to demonstrate convergence between the scales.
Demographic and background variables were examined in relation to the MOA and MOA-TAT summary scores, and are shown in Table 7. For age, there was a trend of healthier scores among older children; however, the single most adaptive scores (i.e. LORS) on the MOA \((r = -0.30, p = 0.05)\) and MOA-TAT \((r = -0.37, p = 0.01)\) were the only statistically significant correlations. Modest negative associations emerged for the MOA mean \((r = -0.23, p = 0.14)\) and mode \((r = -0.22, p = 0.26)\), and the MOA-TAT mean \((r = -0.2, p = 0.12)\), but did not reach statistical significance. The MOA-TAT PATH score, which yielded a positive modest relationship to age that approached significance \((r = 0.27, p = 0.08)\), was the one exception to the general pattern of more adaptive scores among older children in the sample.

Gender yielded a significant relationship to the majority of MOA-, and several of the MOA-TAT summary scores, with females generally expressing more adaptive OR. Significant moderate correlations emerged for the MOA-mean \((r = -0.48, p = 0.001)\) and –HORS \((r = -0.47, p = 0.002)\), and modest correlations for the MOA-LORS \((r = -0.34, p = 0.03)\), MOA-TAT mean \((r = -0.32, p = 0.03)\), and MOA-TAT-LORS \((r = -0.31, p = 0.04)\). The MOA modal score also yielded a modest negative correlation that approached significance \((r = -0.33, p = 0.08)\). Bilingualism was not significantly related to any of the MOA or MOA-TAT summary scores, although bilingual children did tend to produce fewer responses on the TAT (MOA-TAT-R: \(r = -0.34, p = 0.02\)). A one-way ANOVA was conducted to examine potential racial/ethnic\(^{29}\) differences among summary scores. In general, there were no statistically significant differences related to race/ethnicity, with the exception of the MOA-TAT single highest OR score (HORS; \(F = 3.25, p = 0.03\)), which revealed a significantly higher mean score for Caucasians \((M = 5.8, SD = 4.5)\) than Latino/Hispanic \((M = 5.63, SD = 0.96)\) and African American \((M = 5.48, SD = 0.81)\).

\(^{29}\) In accordance with procedures used in the examination of ethnicity/race in relation to IQ, the single Asian participant in the sample was also removed from this analysis.
The relationship between intelligence on the WASI Full Scale IQ and the MOA and MOA-TAT variables was also examined. Although none of the correlations were statistically significant, a consistent trend between higher intelligence and more adaptive OR was revealed. This was evidenced by modest negative associations with the MOA-mean \((r = -.23, p = .13)\), mode \((r = -.20, p = .3)\), and LORS \((r = -.23, p = .15)\), and a weak negative correlation for the PATH \((r = -.16, p = .34)\). On the MOA-TAT, there were negative weak correlations for the mean \((r = -.14, p = .34)\), mode \((r = -.13, p = .43)\), LORS \((r = -.19, p = .2)\), and PATH scores \((r = -.18, p = .42)\). The single highest object relations score (HORS) yielded no relationship to the WASI FIQ on the MOA \((r = -.01, p = .97)\) and the MOA-TAT scales \((r = .05, p = .75)\).

In sum, several noteworthy associations between the demographic and background characters were revealed in relation to MOA and MOA-TAT summary scores, particularly for age and gender, with older children and females generally expressing more adaptive OR.

**Hypotheses**

**Convergence Between MOA and MOA-TAT Scales**

The first hypothesis of the study was that the MOA-TAT, which was developed particularly for the present study, would be significantly related to the MOA Scale, a well-established measure of OR. In order to test this hypothesis, correlational analyses and Paired Samples T-Tests were conducted for each of the MOA and MOA-TAT summary scores in order to examine their convergence. The means, standard deviations, and ranges for the MOA and MOA-TAT summary scores, along with the results of the statistical analyses, are displayed in Table 6.

The total number of MOA and MOA-TAT responses was the focus of the first analysis. The correlation between the average number of MOA and MOA-TAT approached statistical
significance \( r = .28, p = .06 \), indicating that children who produced more OR responses on the Rorschach also tended to generate more OR responses on the TAT. However, t-test comparisons revealed statistically significant differences between the total number of responses on the two scales \((\text{MOA } n = 241; \text{MOA-TAT } n = 341; t = -3.53, p = .00)\), indicating that the TAT elicits more scoreable OR responses than the Rorschach. This particular finding makes sense, as the TAT’s salient character scenes prime for OR more readily than the ambiguous Rorschach inkblots.

The next set of analyses focused on the summary scores that are used to assess OR quality. The mean, mode, single highest (HORS) and lowest (LORS) responses, and frequency of pathological responses (PATH), were examined in relation to one another. Robust associations were revealed for the mean \((r = .57, p = .00)\) and modal scores \((r = .62, p = .00)\), which indicates that children with more pathological MOA mean and modal scores also tended to generate more pathological MOA-TAT mean and modal scores. Paired samples t-tests revealed no significant differences \((t = 1.73, p = .1)\) between the MOA-mode \((M = 3.96; SD = 1.88)\) MOA-TAT mode \((M = 3.96; SD = 1.88)\). However, the mean MOA \((M = 3.89; SD = 1.05)\) and mean MOA-TAT scores \((M = 3.5; SD = .75)\) were found significantly different \((t = 2.95, p = .01)\). This particular finding is likely related to the more adaptive skew revealed for the MOA-TAT, whereby the significantly higher frequency of MOA-TAT Level 2 responses \((t = -3.5, p = .00)\) likely accounts for the lower MOA-TAT mean score.

Moderate associations were revealed for the single most adaptive score \((\text{LORS}; r = .39, p = .00)\) and PATH score \((r = .47, p = .00)\), suggesting that children who produced more adaptive MOA scores on the Rorschach were also more inclined to do so on the TAT. Similarly, children who generated higher frequencies of Level 5, 6, and 7 (MOA-PATH) scores on the Rorschach
also generated higher frequencies of MOA-TAT PATH scores on the TAT. Moreover, paired samples t-tests revealed no significant differences among these summary scores (LORS: $t = .76$, $p = .45$; PATH: $t = 1.2$, $p = .24$).

Unexpectedly, the single most pathological score (HORS) on the MOA and MOA-TAT were not significantly correlated ($r = .08$, $p = .62$), yet t-tests revealed no significant differences ($t = -1.38$, $p = 1.8$; MOA-HORS: $M = 5.28$, $SD = .96$; MOA-TAT-HORS: $M = 5.53$, $SD = .83$). This indicates that each child’s single highest OR score on the Rorschach did not have much bearing on the child’s single highest OR score on the TAT; however, the sample as a whole produced a generally similar single most pathological score on the two scales. With the exception of this particular finding and the significant difference for the mean-MOA- and MOA-TAT-mean scores, the results support general convergence between the MOA and MOA-TAT scales.
Table 6

**MOA and MOA-TAT Summary Scores**

<table>
<thead>
<tr>
<th>Summary Score</th>
<th>MOA</th>
<th>MOA-TAT</th>
<th>Pearson’s Correlation</th>
<th>Paired Sample T-Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Range</td>
<td>Mean (SD)</td>
<td>Range</td>
</tr>
<tr>
<td>Number of Responses</td>
<td>5.18 (3.81)</td>
<td>0-17</td>
<td>7.4 (3.33)</td>
<td>2-19</td>
</tr>
<tr>
<td>Mean</td>
<td>3.89 (1.05)</td>
<td>1.8-5.5</td>
<td>3.5 (.75)</td>
<td>2.29-5.78</td>
</tr>
<tr>
<td>Mode</td>
<td>3.96 (1.88)</td>
<td>1-6</td>
<td>3.42 (1.59)</td>
<td>2-6</td>
</tr>
<tr>
<td>Highest OR</td>
<td>5.28 (.96)</td>
<td>2-7</td>
<td>5.53 (.83)</td>
<td>3-7</td>
</tr>
<tr>
<td>Lowest OR</td>
<td>2.12 (1.3)</td>
<td>1-5</td>
<td>1.98 (.67)</td>
<td>1-5</td>
</tr>
<tr>
<td>PATH (5, 6, 7)</td>
<td>3.47 (3.11)</td>
<td>1-14</td>
<td>2.92 (1.89)</td>
<td>1-8</td>
</tr>
</tbody>
</table>

**The Reciprocal Relationship Among Language, Attention, and OR**

In order to examine the hypothesis that severity of language and attention symptomatology is associated with more pathological OR, correlational analyses were conducted for the CELF-4 Core Language Index (CLI) and CBCL Attention Problems (AP) subscale in relation to MOA and MOA-TAT summary scores. A second set of correlational analyses was conducted for a subset of children with clinically significant language and attention problems, as determined by CLI scores 1.5 standard deviations below normative expectations (Std. Sc < 77) and CBCL AP scores 1.5 standard deviations above normative expectation (T-Score > 65). Notably, 7 (43.75%) of the 16 children with clinically significant symptomatology had comorbid attention and language problems.

As can be seen in Table 8, there were no statistically significant associations among these variables. Nevertheless, several noteworthy trends emerged that were in the expected direction. Weak to modest negative correlations were revealed for the CLI in relation to the MOA-mean (r = -.17, p = .28), modal (r = -.26, p = .14), and PATH scores (r = -.27, p = .1), which provides
some indication that lower language ability is related to more pathological OR. The relationships between the CLI and MOA-TAT summary scores, however, were far more inconsistent and generally weaker. The MOA-TAT LORS (r = -.13, p = .38) and PATH scores (r = -.14, p = .39) were weakly associated with the CLI, suggesting that greater language symptomatology is related to a less adaptive single lowest OR score and a slightly higher frequency of pathological scores. Notably, contrasting this general trend was the finding of a weak, but positive correlation to MOA-TAT-HORS (r = .15, p = .33), which would suggest a more pathological single highest OR score for children with stronger language ability.

More consistent findings emerged for attention problems on the CBCL in relation to OR quality. Modest positive correlations were revealed for the MOA- mean (r = .26, p = .11), modal (r = .29, = .14) and single highest OR score (r = .22; p = .17), and a weak positive association for the MOA-PATH score (r = .15, p = .39). For the MOA-TAT, there was a modest positive correlation for the frequency of pathological scores (r = .27, p = .09), and a positive weak association to the modal score (r = .18, p = .28). Though somewhat mixed, the results provide partial support for the hypothesized relationship between language and attention symptomatology and OR disturbances.

For the second set of analyses, there were 16 children whose Core Language Index (CLI) scores fell below the clinical cutoff (Std. Score < 77), and 15 whose Attention Problems (AP) scores were above the clinical cutoff on the CBCL (T-Score > 65). Among the children with clinically significant language impairment, a very inconsistent picture emerged that generally disconfirmed the study’s hypothesis. With the exception of the MOA-PATH (r = -.25, p = .43), the majority of correlations were positive, indicating that less severe language symptomatology was related to more pathological OR scores. Interestingly, the MOA-TAT variables
demonstrated more consistent relationships to the CLI than MOA variables. Whereas the MOA modal score was the only summary score to yield a relationship to CLI (r = .4, p = .3), the MOA-TAT LORS was the only variable that was completely unrelated to the CLI (r = .01, p = .96). On the MOA-TAT, there was a strong, significant correlation for the highest object relations score (HORS; r = .53, p = .04); moderate, albeit not statistically significant, correlations for the mean (r = .31, p = .25) and modal scores (r = .45, p = .15); and a modest correlation for the PATH score (r = .2, p = .5).

Although no statistically significant findings emerged for children with clinically significant ADHD symptomatology, there were several strong and moderate positive relationships that provide partial support for the hypothesis that more severe attention problems are related to greater OR disturbances. These findings were more robust and consistent on the MOA scale, but still emerged on the MOA-TAT. The MOA-mode and HORS scores were strongly and moderately correlated with attention problems (MOA-Mode: r = .54, p = .17; MOA-HORS: r = .44, p = .16), and the MOA-mean (r = .27, p = .4) and LORS (r = .23, p = .46) were modestly related. The MOA-PATH was the only score that was negatively related to attention problems (r = .11, p = .76). For the MOA-TAT, the modal response yielded the most robust relationship to attention problems (r = .41, p = .18). Weak correlations were revealed for the MOA-TAT mean (r = .13, p = .64) and PATH scores (r = .18, p = .55). The LORS and HORS on the MOA-TAT were unrelated to attention problems (MOA-TAT-HORS: r = -.01, p = .96; LORS: r = -.03, p = .91).

In sum, the findings provided mixed evidence for the hypothesis that language and attention problems are associated with more pathological OR. Whereas language and attention symptomatology was somewhat related to more OR pathology among the entire sample, more
severe language impairment was related to less pathological OR quality. More severe ADHD symptomatology, however, was associated with more pathological OR.

Table 8

MOA and MOA-TAT scores in relation to attention and language ability

<table>
<thead>
<tr>
<th></th>
<th>Total Sample</th>
<th>Clinical ADHD and LI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CLI r, p</td>
<td>CBCL – AP r, p</td>
</tr>
<tr>
<td><strong>Number of Responses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOA</td>
<td>.12, .45</td>
<td>.17, .26</td>
</tr>
<tr>
<td>MOA-TAT</td>
<td>.16, .30</td>
<td>.18, .23</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOA</td>
<td>-.17, .28</td>
<td>.26, .11</td>
</tr>
<tr>
<td>MOA-TAT</td>
<td>.00, .98</td>
<td>.04, .78</td>
</tr>
<tr>
<td><strong>Mode</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOA</td>
<td>-.26, .18</td>
<td>.29, .14</td>
</tr>
<tr>
<td>MOA-TAT</td>
<td>.04, .83</td>
<td>.18, .28</td>
</tr>
<tr>
<td>HORS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOA</td>
<td>-.06, .71</td>
<td>.22, .17</td>
</tr>
<tr>
<td>MOA-TAT</td>
<td>.15, .33</td>
<td>.03, .85</td>
</tr>
<tr>
<td>LORS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOA</td>
<td>.02, .91</td>
<td>.1, .56</td>
</tr>
<tr>
<td>MOA-TAT</td>
<td>-.13, .38</td>
<td>-.04, .81</td>
</tr>
<tr>
<td>PATH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOA</td>
<td>-.27, .10</td>
<td>.15, .39</td>
</tr>
<tr>
<td>MOA-TAT</td>
<td>-.14, .38</td>
<td>.27, .09</td>
</tr>
</tbody>
</table>

Language Impairment Severity and OR Differences on Rorschach Versus TAT

In order to investigate the hypothesis that language impairment is associated with more sophisticated OR on the Rorschach, a nonverbal/perceptual task, than the TAT, a more verbally-based task, each child’s MOA summary scores were subtracted from their counterpart MOA-TAT summary scores to yield an overall “difference” score, which was then correlated with CLI. Positive “difference” scores indicated that a given MOA-TAT summary score was higher (i.e. more pathological) than the counterpart MOA summary score, whereas negative “difference”
scores indicated that the MOA score was more pathological than its counterpart MOA-TAT score. Using this system, it was predicted that lower CLI scores would be related to greater positive difference scores, reflecting more pathological MOA-TAT than MOA scores. This analysis was conducted for the sample as a whole, as well as for the subsample of children whose CLI scores exceeded the designated threshold for clinically significant language impairment (i.e. Std. Score < 77). Results of these analyses are displayed in Table 9.

When examining the entire sample, though there were no statistically significant correlations for any of the MOA “difference” scores, correlational trends emerged that were in the opposite direction than expected. CLI scores were weakly to modestly related to positive MOA “difference” scores for the mean (r = .13, p = .4), mode (r = .10, p = .63), and frequency of pathological scores (i.e. PATH; r = .22, p = .15), suggesting more pathological MOA than MOA-TAT scores among children with better language ability. The one exception was revealed for the single most adaptive score (LORS), for which better language ability was weakly related to a lower (i.e. more adaptive) LORS score (r = -.13, p = .42). The single highest OR “difference” score (HORS) was unrelated to the CLI (r = .04, p = .8).

For the children with more severe language symptomatology (i.e. CLI Std. Score < 77), it was hypothesized that children with lower CLI scores would evidence more pathological OR on the TAT than the Rorschach (i.e. positive MOA “difference” scores). With the exception of the LORS, which yielded a negative, albeit weak correlation to the CLI (r = -.14, p = .66)\(^{30}\), the overall findings were also in strong opposition to the study’s hypothesis. The “difference” mean and modal scores yielded very strong positive correlations to the CLI, with statistically significant findings for the modal score (mean: r = .82, p = .78; mode: r = .77, p = .04). More

\(^{30}\) This finding suggests that children with more severe language impairment tended to produce a more adaptive single lowest scores on the Rorschach MOA Scale than the TAT MOA-T scale.
severe language impairment was also modestly related to a higher frequency of pathological scores on the MOA than the MOA-TAT (PATH: \( r = .28, p = .41 \)). These findings indicate that, in contrast to the study’s hypothesis, children with more severe language symptomatology (i.e. lower CLI scores) evidenced more pathological OR quality on the Rorschach than the TAT.

**Table 9**

*Language symptomatology in relation to “difference” MOA scores*

<table>
<thead>
<tr>
<th>Difference OR Score (MOA-TAT – MOA)</th>
<th>Total Sample</th>
<th>Clinical Language Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CLI</td>
<td>CLI</td>
</tr>
<tr>
<td>Mean OR Score</td>
<td>.13, .40</td>
<td>13</td>
</tr>
<tr>
<td>Modal OR Score</td>
<td>.10, .63</td>
<td>7</td>
</tr>
<tr>
<td>Highest OR Score</td>
<td>.04, .80</td>
<td>13</td>
</tr>
<tr>
<td>Lowest OR Score</td>
<td>-.13, .42</td>
<td>13</td>
</tr>
<tr>
<td>PATH (5, 6, 7) Score</td>
<td>.22, .15</td>
<td>11</td>
</tr>
</tbody>
</table>

**Ancillary Analysis**

In adapting the MOA scale to the TAT, qualitative observation corroborated the hypothesis that the TAT elicits more scoreable OR responses than the Rorschach due to the centrality of characters and relationships on the cards. Given the extent to which the TAT primes for OR, the clinical significance of limited OR responses on the TAT became of interest to this author. As such, a score of 8\(^3\) was assigned when there was no OR response on a TAT card. The frequencies of MOA-TAT 8 responses were examined in relation to demographic and background variables, attention and language symptomatology, and response-level frequencies

\(^3\) MOA-T scores of 8 were regarded as “missing” in the calculation of summary scores that were utilized to examine the main hypotheses of the current study.
and summary scores on the MOA and MOA-TAT. Because these analyses were purely exploratory in nature, no particular hypotheses were generated.

**Demographic and Intelligence, Language, and Attention Variables**

The frequencies of Level 8 responses were examined in relation to age, gender, bilingual status, race/ethnicity, and intellectual ability on the WASI FIQ. Age was found to be significantly related to the frequency of Level 8 responses ($r = -.4, p = .01$), with younger children producing more Level 8 responses (i.e. fewer OR responses) on the TAT. Its relationship to gender approached significance ($r = -.25, p = .09$), with T-Tests further showing higher frequencies among males ($M = 2.5, SD = 1.93$) than females ($M = 1.5, SD = 1.36$; $F = 3.03, p = .09$). A significant correlation was also revealed for bilingual status ($r = .39, p = .01$), with significantly higher frequencies of Level 8 responses among bilinguals ($M = 3.23, SD = 1.59$) than non-bilinguals ($M = 1.77, SD = 1.7$; $F = 7.3; p = .01$). A one-way ANOVA analysis revealed no significant racial/ethnic differences in the frequencies of 8 scores ($F = 2.1, p = .12$).

In examining each child’s frequency of MOA-TAT Level 8 responses in relation to intelligence, language, and attention, weak negative correlations emerged for all three variables; however, none were statistically significant (WASI: $r = -.13, p = .37$; AP: $r = -.19, p = .2$; CLI: $r = -.15, p = .31$). This suggests that greater intelligence and language ability, as well as more attention problems, may be associated with fewer Level 8 responses.
Table 10

Frequency of Level 8 Responses in Relation to Demographic Variables, IQ, Language, and Attention Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>r</th>
<th>p</th>
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<tr>
<td>Age</td>
<td>-.4</td>
<td>.01</td>
</tr>
<tr>
<td>Gender</td>
<td>-.25</td>
<td>.09</td>
</tr>
<tr>
<td>Male (Mean, SD)</td>
<td>2.5 (1.93)</td>
<td></td>
</tr>
<tr>
<td>Female (Mean, SD)</td>
<td>1.53 (1.36)</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American (Mean, SD)</td>
<td>1.95 (1.86)</td>
<td></td>
</tr>
<tr>
<td>Latino/Hispanic (Mean, SD)</td>
<td>2.69 (1.54)</td>
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</tr>
<tr>
<td>Caucasian (Mean, SD)</td>
<td>1.2 (1.3)</td>
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</tr>
<tr>
<td>Bilingual Status</td>
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<tr>
<td>Bilingual (Mean, SD)</td>
<td>.39</td>
<td>.01</td>
</tr>
<tr>
<td>Not Bilingual (Mean, SD)</td>
<td>3.23 (1.59)</td>
<td>.01</td>
</tr>
<tr>
<td>IW Full Scale IQ</td>
<td>-.13</td>
<td>.37</td>
</tr>
<tr>
<td>CBCL Attention Problems</td>
<td>-.19</td>
<td>.2</td>
</tr>
<tr>
<td>CELF-4 Core Language Index</td>
<td>-.15</td>
<td>.31</td>
</tr>
</tbody>
</table>

Response Level Frequencies and Summary Scores

Using Pearson’s correlations, the frequency of Level 8 responses were examined in relation to the frequencies of each of the response levels on the MOA and MOA-TAT.

Correlations could not be calculated for Level 7 responses on either scale due to their infrequency. Though no statistically significant findings emerged for any of the MOA scale-point frequencies, there was a trend of positive correlations for the more adaptive scale points and negative correlations for the more pathological ones. Higher MOA-TAT-8 frequencies were weakly related to more MOA-1 responses (r = .14, p = .6), and modestly to moderately related to fewer Level 5 and 6 responses (MOA-5: r = -.3, p = .09; MOA6: r = -.24, p = .3). They were unrelated to the frequencies of Level 2, 3, and 4 responses (MOA2: r = .03, p = .87; MOA3: r =
.09, p = .7; MOA4: r = -.01, p = .99). On the MOA-TAT, there were negative correlations, some significant, to all the scale points, which makes sense given that no OR response to card necessarily means fewer other scale points are assigned (MOAT1: r = -.37, p = .37; MOAT2: r = -.57, p = .00; MOAT3: r = -.33, p = .05; MOAT4: r = -.07, p = .85; MOAT5: r = -.4, p = .02; MOAT6: r = -.33, p = .11).

As for MOA and MOA-TAT summary variables, higher frequencies of 8’s on the MOA-TAT were modestly associated with fewer total number responses on the MOA Rorschach scale (r = -.31, p = .04), and very strongly related to fewer total responses on the MOA-TAT (r = -.88, p = .00), which again, is expected given that their presence necessarily means another MOA-TAT score is not assigned. The mean and modal MOA and MOA-TAT scores were highly unrelated to the frequency of MOA-TAT8 (MOA-Mean: r = .01, p = .93; MOA-Mode: r = -.01, P = .96; MOA-TAT Mean: r = .03, p = .82; MOA-TAT Mode: r = .04, p = .83). There were weak to modest, but not significant, correlations for the HORS, LORS, and PATH scores on the MOA, with higher Level 8 frequencies bearing some relationship to a more adaptive single highest OR score, a more pathological single lowest OR score, and lower frequencies of pathological scores (HORS: r = -.12, p = .45; LORS: r = .22, p = .15; PATH: r = -2, p = .17). A similar, but far more robust, pattern emerged for the MOA-TAT. Higher frequencies of 8 responses were associated with lower (i.e. more adaptive) single highest OR scores (r = -.35, p = .02), higher (i.e. less adaptive) single lowest OR scores (r = .43, p = .00), and lower frequencies of pathological OR scores (PATH: r = -.48, p = .00). This pattern suggests that the presence of 8’s reflects the conscious and/or unconscious repression of more pathological responses, which would still manifest in a higher LORS because its less threatening nature would not require such strong defenses.
Table 11

Frequency of Level 8 Responses in Relation to MOA and MOA-TAT Response-Level Frequencies and Summary Scores

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<tr>
<td>MOA6</td>
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<td>MOA-TAT4</td>
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<td>MOA-TAT5</td>
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<td>Highest OR</td>
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<td>Lowest OR</td>
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<td>PATH</td>
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Note: Bold responses are those preferred by respondents.
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Table 7: Demonstrative and Background Variables in Relation to VOA and VOA-E Summary Scores
Discussion

The present study investigated the influences of attention and language functioning on object relational (OR) quality among a sample children identified as at-risk for ADHD and SLI. OR was measured by the Rorschach MOA scale (Urist, 1977; Urist & Shill, 1982), which was adapted for the TAT (MOA-TAT), in order to examine OR differences between the Rorschach and TAT, particularly with respect to language functioning. Based on existing literature, it was the MOA and MOA-TAT scales were expected to converge in their measurement of OR, and language and attention symptomatology were expected to be significantly correlated with more pathological OR on both scales. A different pattern, however, was hypothesized for children with clinically significant language impairment, who were expected to evidence more pathological OR on the MOA-TAT due to greater language demands of the TAT.

The results of the study provide preliminary support for the MOA-TAT scale as a reliable and valid measurement of OR. The MOA and MOA-TAT significantly converged in their measurement of OR, but evidenced some differences that indicated they tap slightly different facets of OR. The hypothesis that language and attention symptomatology would be related to more pathological OR was partially confirmed by correlational trends, with more consistent findings revealed for attention than language. Disconfirming evidence, however, emerged for the hypothesis that severity of language impairment would be related to more pathological OR on the TAT than the Rorschach. Herein, the implications of these findings will be discussed within the context of the existing literature and their relevance to clinical practice, as well as methodological limitations of the study and suggestions for future research.
The Mutuality of Autonomy Scale for the TAT (MOA-TAT)

This study is the first to attempt a systematic adaptation of the MOA Scale for the TAT (MOA-TAT). As previously mentioned, the MOA Scale was identified as an optimal measure for this study because it would allow for greater cross-comparison equivalence, and is regarded as an implicit assessment of OR that is well-established in pediatric samples (Fowler & Erdberg, 2005; Steven Tuber, 1992). These were essential features given that the study sample was comprised of children with language and attention symptomatology. The MOA-TAT was examined in relation to the MOA scale to investigate convergent validity and to determine whether OR differences exist between the Rorschach and TAT in general, and with respect to attention and language functioning.

Current findings provide the first evidence in support of the MOA-TAT as a reliable and valid measure of OR. Inter-rater agreement was found to be excellent (Cicchetti, 1994; Cicchetti & Sparrow, 1981; Fowler & Erdberg, 2005), and was nearly identical to that of the MOA scale. Moderate to strong correlations were revealed for the MOA and MOA-TAT summary scores, and the scale-point distributions and summary scores were found to be generally similar across the two measures. The aim and results of the present study stand in the tradition of the original MOA research’s extension of the scale to other clinical instruments (Urist, 1977; Urist & Shill, 1982), and are consistent with numerous other successful adaptations of OR measures from one clinical instrument to another (Krohn & Mayman, 1974; Segal et al., 1992; Spear & Lapidus, 1981; Urist, 1977; Urist & Shill, 1982).

Despite the overall pattern of convergence revealed for the MOA and MOA-TAT scales, several notable differences emerged that warrant discussion. First, the distribution of MOA-TAT scores was more adaptive than that of the MOA scale, which was evidenced by a lower mean OR
score and a higher frequency of level 2 responses\textsuperscript{32}. Such findings raise important issues regarding the conceptualization of MOA scale points in their adaptation to the TAT. Though this author made every attempt to maintain the integrity of the MOA scale, some modifications were necessary given the different stimulus characteristics and task demands of the TAT. Notably, scale-point 4, which underwent the most significant revision due to the fact that it is primarily intended for Rorschach mirror-responses, did not yield significant differences in terms of its frequency on the two scales.

With regard to the high frequency of Level 2 responses, however, the TAT’s salient depictions of characters, several of which portray multiple characters, increases the likelihood of neutral-interaction depictions for cards that are not imbued with malevolent features. The characteristics of the study sample are also important to consider here, as participants did not evidence particularly high levels of OR pathology\textsuperscript{33} (Fowler & Erdberg, 2005), and therefore may have been more inclined to express neutral and benign interactions. Despite the added specifications to the MOA-TAT manual (see Appendix I), which explicitly states a scale-point two should not be assigned to characters described in parallel activity who are not engaged or aware of one another, the exceedingly high frequency of MOA-TAT 2 responses suggests further refinement of MOA-TAT scale points may be necessary to allow for finer discrimination in the scoring process.

The distribution differences between the MOA and MOA-TAT scales also suggest the two measures may assess different, yet related aspects of OR. The unique influences of the Rorschach versus the TAT in OR assessment must be taken into account in this respect, as research indicates less overlap between Rorschach and TAT measures of OR than other OR

\textsuperscript{32} The higher frequency of MOA-T 2 responses likely accounts for the lower MOA-T mean score.

\textsuperscript{33} The total sample only produced three Level 7 responses and the mean OR score was in the benign range.
assessment methods. For example, a recent meta-analysis by Graceffo et al. (2014) on the criterion validity of the MOA Scale revealed that the TAT produced significantly smaller effect sizes than four of the six criterion variables examined (i.e. clinician ratings, diagnostic differentiation, objective events, and self-attributed characteristics). This indicates that OR measures for the TAT may be less related to the MOA scale than other OR assessment instruments.

In a similar vein, the Rorschach is thought to tap into unconscious processes more than the TAT, which is generally regarded as more accessible to the preconscious (S. Tuber & Meehan, in press). Accordingly, the MOA scale may elicit more unconscious, primitive OR representations, while the TAT elicits more conscious OR representations that are more amenable to psychological defense and censorship. Indeed, there is evidence to indicate greater OR pathology on scales designated for the Rorschach than TAT. For example, Ackerman et al. (2001) demonstrated that SCORS variables on the TAT were far more consistently related to adaptive MOA variables (i.e. MOA-1 and MOA-LORS) than pathological MOA variables (i.e. MOA-7 and MOA-HORS) on the Rorschach. Of the eight SCORS variables, six were significantly related to the frequency of MOA-1 responses and five to the MOA-LORS, as compared to two significant correlations revealed for the frequency of MOA-7 and one for the MOA-HORS. Though the use of different scales is an obvious factor to consider in the interpretation of such disparities, it is also possible that the Rorschach is more sensitive to OR pathology than the TAT which, as suggested by the current study, may tap into more indicators of psychological health (see Appendix II for clinical case examples of the similarities and differences in OR on the Rorschach and TAT).
A second major finding of the study was that children generated significantly more MOA-TAT than MOA responses, and those who produced more responses on one scale tended to generate more responses on the other. Similar to previous studies (Cooper, 2003; S. Tuber, 1989), children in the current study produced an average of 5.18 MOA responses to the 10 Rorschach cards. This significantly contrasts the average of 7.4 MOA-TAT responses for the 8 TAT cards administered as part of this investigation. These findings make sense given the TAT’s salient depiction of character scenes. As eloquently expressed by Hibbard and colleagues (1995): “The opportunity to display narrative interaction is limited in the Rorschach, but invited in the TAT.” Nevertheless, these findings represent an important contribution to OR assessment practices, as the MOA-TAT offers examiners the opportunity to examine a broader range of OR functioning by increasing the number of responses and allowing for assessment of different OR dimensions.

**Additional Features of the MOA-TAT Scale**

A number of important features about the MOA-TAT scale were revealed from the present study’s investigation of the MOA and MOA-TAT scales in relation to demographic variables, individual Rorschach and TAT cards, and the ancillary analysis exploring the potential value of MOA-TAT scale point 8. An overview of these findings will be provided and discussed herein.

**Demographics.** Significant effects for age and gender emerged for both scales, with older children and females expressing more adaptive OR. Though age has been shown to correlate with OR development in studies using other OR measures (Blatt et al., 1976; Westen et al., 1991), the current findings contrast several MOA studies showing age to be unrelated to OR in both clinical and nonclinical pediatric samples (Cooper, 2003; S. Tuber, 1989; Steven Tuber, 34 Notably, the range of OR responses was 0-17 for the Rorschach and 2-22 for the TAT.
1992; Steven Tuber & Coates, 1989). That more adaptive OR was identified among female participants, however, does correspond with prior MOA studies (Cooper, 2003; S. Tuber, 1989), and continues to raise interesting questions regarding gender-related differences in OR development. S. B. Tuber (1989), for example, postulated that the more adaptive OR found in females may be due to earlier awareness of others in interaction and the higher levels of aggression more typical to males. Nevertheless, the current findings may also be due to the disproportionate representation of males in the study sample. For the most part, bilingualism and race/ethnicity were unrelated to OR quality. However, bilingual children tended to produce fewer MOA-TAT responses, which indicates language facility has some influence on TAT narratives. Similar to previous MOA studies (Ryan et al., 1985; S. Tuber, 1989), intelligence was also not significantly related to OR quality. However, statistical trends emerged suggesting higher intelligence may bear some influence on adaptive OR functioning.

**Individual Card Analysis.** Responses frequencies and summary scores of the MOA and MOA-TAT were also examined in relation to each individual Rorschach and TAT card, which revealed a strong relationship between OR responses and the stimulus pull from each particular card. Findings indicate Rorschach Cards III, VIII, and X, and TAT Cards 8BM and 12M elicit the highest frequency of responses, and Rorschach Cards IV and V, and TAT Cards 1 and 2 elicited the lowest. The most pathological responses emerged on Rorschach Cards I, II, and IX, and TAT Cards 3BM and 8BM, and the most adaptive on Rorschach Card VII and TAT Cards 1, 2, and 7GF. Notably, these findings diverge from MOA research by Cooper (2003), which revealed that Card VI elicited the most malevolent responses and Card II the most adaptive. Nevertheless, such findings offer additional normative data that may inform selection of cards to
administer, and interpretation of scores in such a way that takes the particular effects of each stimulus into account.

**Exploratory Analysis of MOA-TAT 8.** Given that children generated a significantly higher frequency of MOA-TAT responses, which substantiates the claim that the TAT primes for OR more than the Rorschach, the clinical significance of few MOA-TAT responses became of particular interest to this author. As such, scores of 8 were assigned to TAT cards that did not contain an OR response. In an effort to examine its potential clinical utility, the frequency of MOA-TAT 8 scores was explored in relation to demographic variables, attention and language symptomatology, and frequencies of each response level and summary scores on both the MOA and MOA-TAT. Findings revealed that younger children, males, and bilingual participants produced higher frequencies of MOA-TAT-8 scores (i.e. no scores), and there were no significant racial/ethnic differences.

Weak negative correlations emerged when examining the frequency of MOA-TAT-8 in relation to intelligence, language, and attention. Though none of the findings were statistically significant, they suggest the children with superior intelligence and language ability are more likely to provide OR responses, and thus receive fewer MOA-TAT 8 scores. That children with more attention problems produced fewer non-OR responses is an interesting finding that could be explained by more impulsive, hyper-verbal response styles.

Efforts to determine whether MOA-TAT-8 is more reflective of adaptive or pathological processes were made by investigating the frequency of scores in relation to MOA and MOA-TAT response-level frequencies and summary scores. Though not statistically significant, positive correlational trends emerged for adaptive scale points on the MOA and negative correlations for the more pathological scale points, suggesting its presence may reflect more of
an adaptive process. The negative correlations that emerged for the MOA-TAT scale points and summary scores could not be interpreted in a meaningful way. However, the finding makes sense given that the absence of an OR response necessarily means fewer of the other scale points are assigned.

Regarding summary scores, the mean and modal MOA and MOA-TAT scores were unrelated to the frequency of MOA-TAT 8 scores; however, higher frequencies of Level 8 responses were related to a more adaptive single highest OR score and lower frequencies of pathological scores, suggesting that the presence of MOA-TAT 8 may represent conscious and/or unconscious repression of more pathological responses. That higher frequencies of MOA-TAT 8 was also found to be related to more pathological single lowest OR scores does not necessarily contradict the aforementioned supposition, as the LORS reflects a less threatening response that would not warrant the same level of psychological defenses as more malevolent responses.

**The Reciprocal Relationship Among Attention, Language, and OR Functioning**

Few studies have examined the influence of neurocognitive mechanisms on OR functioning. As such, the present study entered relatively new terrain in its focused investigation of the relationships among attention, language, and OR quality. Though overall findings were not statistically significant, emerging trends provide some support for the hypothesized relationship among these variables. Weak to modest correlations were revealed for language and attention problems in relation to OR pathology, and severity of attention problems was related to more OR pathology among a subset of children classified as ADHD. Contradictory findings emerged for children classified as language impaired, who showed more adaptive OR in relation to more severe language symptomatology. Unexpectedly, the MOA scale demonstrated a more consistent
relationship to attention and language than the MOA-TAT scale, which represents a methodological issue that will be addressed in subsequent sections (refer to “Language Impairment Severity and OR Pathology on the Rorschach Versus the TAT” and “Study Limitations”). Further complicating matters is the fact that 43.75% of the children with clinically significant symptomatology had comorbid attention and language problems.

Nevertheless, current findings related to attention symptomatology are consistent with three prior studies showing more severe OR pathology among children with ADHD and other impulse-control disorders than clinical controls (Calabrese et al., 2005; Matesevac, 1994; Thomas, 1987), as well as research by Ryan et al. (1985), which found that more malevolent OR predicted lower teacher-ratings of attention. Rorschach studies revealing fewer human movement responses, along with fewer indicators of regulatory capacities and internal resources, in ADHD children also correspond with current findings (Bartell & Solanto, 1995; Cotugno, 1995; Gordon & Oshman, 1981; Jain et al., 2005; Meehan et al., 2008a). Current results are also congruent with preliminary evidence of greater OR disturbances among clinical pediatric samples with general learning disabilities (LD) in comparison to clinical-controls (Murphy, 2004; Westen, Ludolph, Block, et al., 1990), as well as more extensive body of research documenting higher rates of insecure and avoidant attachment and lower rates of secure attachment among LD children (e.g., Al-Yagon, 2008, 2010; Al-Yagon, 2012; Al-Yagon & Mikulincer, 2004).

Though these LD studies have some bearing on current findings pertaining to language, these particular findings were more difficult to contextualize within the literature because this study is the first to investigate a direct relationship between language symptomatology and OR. Further complicating matters is the finding that severity of language impairment was related to more adaptive OR among the subset of SLI children. Not only does this finding contradict the
study’s hypothesis, but it also conflicts with general trends revealed for language and OR within the sample as a whole. That severity of language impairment was unrelated to the total number of OR responses on both scales rules out the possibility that these children produced a more restricted range of responses. However, given that referrals to the original NIDCD study were primarily based on reading and behavioral problems, the particular characteristics of the study sample may account for these findings. Given the high comorbidity between language and reading disorders (Hayiou-Thomas et al., 2010; Lewis et al., 2011; Tomblin et al., 2000), children with significant language symptomatology were more likely referred for reading problems, which represents a vastly different psychological and symptom profile than behavioral difficulties. Hence, the findings may reflect lower levels of psychopathology among this particular subset of children, as compared to the rest of the sample, which may have been more populated by children with behavioral difficulties. Greater efforts to control for the degree of psychopathology would have been useful in this respect.

Similarly, because OR disturbances are implicated in a broad range of socio-emotional problems and psychopathology (see review, Steven Tuber, 1992), which are highly prevalent among children with ADHD and SLI (Elbro et al., 2011; Marton et al., 2005; Miranda et al., 2008; Nixon, 2001; Redmond, 2011), it is also difficult to determine whether current findings reflect a discrete relationship among study variables or high rates of comorbidity between LD and psychopathology. The MOA scale’s limited specificity for distinguishing OR disturbances from general pathological functioning adds another dimension of ambiguity to interpretation of the current findings (Berg et al., 1993; Blatt et al., 1990; Bombel et al., 2009). Though the study sample did not evidence particularly high levels of OR pathology\textsuperscript{35}, it is difficult to discern

\textsuperscript{35} As previously mentioned, the frequency of MOA7 responses was very low and the mean OR score was in the benevolent range on both the MOA and MOA-T scales.
whether the results represent specific OR disturbances or more general psychopathology, especially in the absence of a non-clinical control group. However, as asserted by previous authors, the overlap between OR and psychological functioning remains consistent with the theoretical foundation of the measure (Bombel et al., 2009; Steven Tuber, 1992). In this regard, efforts to disentangle the two constructs may be unnecessary.

**Language Impairment Severity and OR Pathology on the Rorschach Versus the TAT**

Contrary to the study’s hypothesis, results revealed that language impairment severity was related to greater OR disturbance on the Rorschach, especially among the subset of children classified as SLI. The expectation that language impairment severity would correlate with more adaptive OR on the Rorschach, a predominantly nonverbal/perceptual task, was based on findings from the SLI literature. Numerous studies demonstrate that SLI children demonstrate intact social-cognition, emotional understanding, and theory of mind on perceptually-based tasks, and improved performance in these areas when language demands are reduced or eliminated altogether (e.g., Boucher et al., 2000; Nancy J. Cohen et al., 1998; Miller, 2001). As a narrative-based task, the TAT relies on higher-order language and cognitive skills, areas often impaired among SLI children (Fey et al., 2004; Liles, 1985; Manhardt & Rescorla, 2002; Merritt & Liles, 1987; Rhea Paul et al., 1996; Rhea Paul & Smith, 1993; Wagner et al., 1999). Thus, it was thought that children with more severe language symptomatology would show more OR disturbances on the TAT than the Rorschach due to its higher demands on language.

Though the TAT imposes greater demands on the language system in terms of narrative coherence and organization, the process of verbally articulating the highly ambiguous perceptual stimuli of the Rorschach may in fact be more taxing to the language system than originally conceived by this author. Though certainly a plausible explanation, methodological issues
pertaining to the MOA-TAT scale are most definitely implicated. As previously noted, despite the overall convergence between the MOA and MOA-TAT scales, the MOA had a more pathological distribution of scores and demonstrated a far more consistent relationship to language and attention symptomatology than the MOA-TAT. Given that the method for calculating OR differences between the Rorschach and TAT entailed subtracting MOA summary scores from their MOA-TAT counterpart scores, the aforementioned differences between the two scales would be expected to effect the calculated “difference” scores in the precise ways revealed in this study. Together, these findings suggest that while the MOA-TAT scale measures OR in similar ways to the MOA, cross-comparison equivalence between the Rorschach and TAT cannot yet be assumed without further research.

**Clinical Implications**

The current study’s findings regarding the MOA-TAT scale represent an important contribution to the OR assessment literature. Numerous OR measures have been developed and supported by empirical research (for reviews, see Huprich & Greenberg, 2003; Stricker & Healey, 1990). Despite the use of diverse methods in their assessment of OR (i.e. projective techniques, narrative data, and self-report questionnaires), this extensive body of literature consistently implicates OR disturbances in multiple forms of psychopathology in both adults and children (Bedi et al., 2012; Bell et al., 1988; Berg et al., 1993; Goddard & Tuber, 1989; Heesacker & Neimeyer, 1990; J. F. Murray, 1985; Rutherford et al., 1996; Westen, 1991; Westen, Lohr, et al., 1990; Westen, Ludolph, Lerner, et al., 1990). Nevertheless, the diverse set of measures is problematic in many ways, as it limits generalizability of individual findings and discourages standardized administration and interpretation practices that might otherwise allow
for more in-depth investigation of OR and its unique role in various forms of psychopathology.\(^{36}\)

Given that the Rorschach and TAT are among the most widely used instruments in clinical assessment (Archer et al., 1991; Archer & Newsom, 2000; C. E. Watkins et al., 1995), the current study’s successful adaptation of the well-established Rorschach MOA scale to the TAT introduces the possibility of a more streamlined approach to OR assessment that is more accessible to clinicians and researchers alike. With its relatively efficient scoring system, the MOA-TAT represents an alternative to the SCORS which, despite its very respectable psychometric properties (Ackerman et al., 1999; Barends et al., 1990; Hibbard et al., 1995; Westen, Lohr, et al., 1990; Westen et al., 1985), entails a highly intricate scoring system that encompasses several dimensions that do not pertain directly to OR (Westen, 1995).

The general convergence of the MOA and MOA-TAT scales shown in the present study suggests the measures may be used together to conduct more comprehensive assessments of OR (see Appendix II for clinical case examples). Although cross-comparison equivalency cannot not be assumed, the MOA-TAT’s more adaptive distribution and higher response rates may allow for evaluation of a broader range of OR functioning by tapping more indicators of health and expanding the number of data points. The latter finding is especially useful for pediatric assessments, as some children produce even fewer than the five MOA responses generated on average (Cooper, 2003; S. Tuber, 1989), which constrains clinical interpretation of OR data. Thus, the MOA-TAT reduces the likelihood of such occurrences, especially if used in conjunction with the MOA scale.

The current study’s use of the MOA-TAT’s in a pediatric sample also has important clinical implications, as the SCORS is not well-established for use in children (Freedenfeld et al.,

\(^{36}\) The use of different measures results in numerous replications of similar findings to support the validity of each measure, which ultimately narrows the scope of OR research.
1995; Ornduff & Kelsey, 1996). That the MOA is well-validated in child populations (Steven Tuber, 1992), suggests that the adapted MOA-TAT will continue to prove itself as a reliable and valid measure of OR in future studies of children. Similarly, that language symptomatology did not interfere with MOA-TAT data indicates that, much like the MOA, it is an implicit measure of OR (Fowler & Erdberg, 2005). This particular feature was part of the rationale for its use in the current study sample, as prior research reports difficulties applying the SCORS to TAT protocols of LD children (Westen, Ludolph, Block, et al., 1990). Thus, the MOA-TAT scale offers numerous unique contributions to research and clinical practice that are worthy of further investigation.

The value of OR assessments in clinical evaluation and interventions for ADHD children is also highlighted by current and prior findings of the relationship between attention symptomatology and OR disturbances ((Achenbach, 1991; Calabrese et al., 2005; Ryan et al., 1985; Thomas, 1987)\(^3\). Given the extent to which ADHD is a heterogeneous and multi-determined disorder, methods to tease apart more biologically-based expressions from those that are more driven by environmental influences may prove useful in generating effective treatment recommendations. This concept is exemplified in research by Leuzinger-Bohleber et al. (2011), who demonstrated that ADHD subgroups classified based on biological versus environmental risk factors showed differential responses to treatment. In a similar respect, the potential utility of OR assessment for aiding in the differential diagnosis of ADHD and childhood trauma is a particularly exciting prospect (Conway, 2012; Famularo et al., 1996; J. D. Ford et al., 2000; Szymanski et al., 2011).

Research demonstrating the considerable influences of attachment quality on ADHD

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\(^3\) Such clinical implications cannot be surmised for SLI due to the inconsistent findings for language symptomatology.
symptomatology and the level of socio-emotional functioning among LD children (e.g., Al-Yagon, 2008; Al-Yagon, 2012; Al-Yagon & Mikulincer, 2004; Thorell et al., 2012), also indicates that OR also represents an important target of clinical intervention. Standard ADHD treatment practices, which typically focus on neurobiological, neurocognitive, and dysregulatory features of the disorder, generally rely on psychostimulants, cognitive remediation, and behavioral interventions to attenuate symptoms (Group, 2004; Hodgson, Hutchinson, & Denson, 2014; Molina BSG, 2009; Swanson JM, 2007). Despite its proven efficacy, such intensive focus on external manifestations often overlooks the unique intrapsychic experiences that influence the individualized expression of the disorder (Gilmore, 2000, 2002). In this way, incorporating OR assessment into psychological, psychoeducational, and neuropsychological evaluations will allow for a more holistic and nuanced conceptualization of each child’s unique presentation of the disorder. This, in turn, will prove useful for generating tailored intervention and treatment recommendations for each particular child.

**Limitations of the Study**

The current study contains several limitations in its methodology and findings. First, the MOA-TAT has never been used before, and was therefore used as an exploratory measure of OR for the TAT. Though results revealed excellent reliability and significant convergence validity, further investigation of its psychometric properties is necessary. In the current study, raters were not blind to the study hypotheses and, because language and attention impairments were relatively easy to detect in the protocol transcripts, there was potential for bias in the scoring process. The study also did not control for the individual stimulus effects of each Rorschach and TAT card, which were shown to differentially influence OR responses. Thus, future research should use blind raters and control for the diverse stimulus pulls of each card in order to further
establish reliability and validity of the MOA-TAT. Without empirical support for the measure, many of the interpretations of the current study’s findings are speculative in nature. For example, that the MOA demonstrated a more consistent relationship to language and attention than the MOA-TAT is impossible to explain without any background information on the scale. In a similar vein, the innovative methods and hypotheses of the current study made it difficult to explain several findings due to the dearth of existing literature.

Another methodological issue concerns the relationship identified for intelligence and language functioning, which was not controlled for in subsequent analyses in order to avoid further reduction of statistical power. As such, intelligence represents a confounding variable in the analyses conducted for language symptomatology. However, the relationship between language ability and intelligence is well-established (Jepsen et al., 2008; Wechsler et al., 2004), and may therefore be impossible to disentangle. Similarly, the high rates of comorbidity between attention and language problems among the subset of children with clinically significantly symptomatology made it difficult to tease apart the singular effects of attention versus language. The present study also did not control for the level of psychopathology, which represents another confound due to the significant overlap between OR disturbances and psychopathology (Berg et al., 1993; Blatt et al., 1990; Bombel et al., 2009).

There are also a number of limitations related to the study sample. First, the use of a small sample reduced statistical power, decreasing the likelihood of significant findings. Consequently, many of the interpretations are based on statistical trends rather than significant results. Second, the sample was primarily comprised of children from urban, lower SES, and minority backgrounds, and demographic characteristics were unequally distributed. While the use of an underrepresented sample offers unique value to the literature, this population inevitably
faces certain difficulties that may limit generalizability of the findings to other populations. Lastly, the recruitment process in the original NIDCD study created a sampling bias. Children with significant language symptomatology are far more likely to have been referred for reading difficulties, which presumably involves a less symptomatic profile, than behavioral problems. Without the use of a non-clinical comparison group or other methods to control for levels of psychopathology, it is difficult to distinguish the influences of language and attention symptomatology from the effects of general psychopathology on OR functioning.

**Conclusions and Future Directions**

Findings from this study provide preliminary support for the MOA-TAT as a reliable and valid measure of OR. Further investigation into its psychometric properties is recommended, as the measure has the potential to offer unique contributions to OR literature and clinical practice. Examination of its convergence with other OR measures, particularly the SCORS, and its validity for adults are logical follow-up studies. Future investigation into factors accounting for the OR distribution differences between the MOA and MOA-TAT scales would also be important. Other possible extensions of the current research could include further examination of the stimulus effects of each, individual TAT card, or application of the MOA-TAT scale to other TAT cards beyond the eight administered as part of this study. The use of larger, more representative samples, is recommended to improve the statistical power and generalizability of results from any of these potential studies.

The overall convergence revealed between the two scales indicate that the MOA-TAT may be used in conjunction with the MOA scale to conduct more comprehensive assessments of OR functioning. However, findings revealed that cross-comparison equivalency between the two scales cannot be assumed because of the MOA-TAT’s more adaptive distribution of scores.
Though this may reflect greater sensitivity to adaptive functioning, which would represent clinically useful data, further research is necessary to support these claims. Another important difference between the two scales is that there were significantly more MOA-TAT than MOA responses, which would further contribute to a broader-range assessment of OR. However, future replication of the current study’s comparisons between the two scales is necessary to determine the optimal method for using the two scales together in both research and clinical evaluations.

Results pertaining to the relationships among attention, language, and OR were not statistically significant, and were therefore more difficult to interpret. This was especially the case for language symptomatology, which revealed convoluted findings. Future research may consider further investigation of these relationships in a larger sample, which would enhance statistical power. The use of a nonclinical comparison group is also recommended to better control for effects of general psychopathology, which was identified as confounding variable in the current study. That consistent trends were revealed for attention symptomatology in relation to OR disturbances highlights the value of OR assessment for clinical evaluation of ADHD. The potential utility of OR assessment for aiding in differential diagnosis of ADHD and childhood trauma is a particularly exciting prospect, and is an important line of inquiry for future research. In sum, the MOA-TAT offers a number of promising contributions to OR research that warrant further investigation for its potential use in clinical assessment practice.
The present manual was extended and extrapolated to the Thematic Apperception Test (TAT) by Katherine Eiges in collaboration with Steve Tuber, Ph.D. The descriptions for each of the scale points are based on the original Mutuality of Autonomy scale developed Dr. Jeffery Urist, Ph.D. (1977; Urist & Shill, 1982) that was further elaborated upon by Dr. Steven Tuber (Coates & Tuber, 1988).
Note: The relationships between characters can be explicitly referenced between characters on a card or between a character and an implied object (e.g. “the man shot the woman” and “the woman was shot” would be assigned the same score even though a second character is not explicitly mentioned).

Scale Point 1: Reciprocity-Mutuality; Collaboration-Cooperation

Characters are engaged in some relationship or activity in which they are together and involved with each other in such a way that conveys a reciprocal acknowledgement of their respective individuality. The narrative contains explicit or implicit reference to the fact that the characters are separate, autonomous, and involved with each other in a way that recognizes or expresses a sense of mutuality in the relationship.

Scale point 1 is the most adaptive response and, as such, should be scored conservatively (Coates & Tuber, 1988). The unique contributions of each individual character to the mutual interaction need to be emphasized. These responses reveal healthy relationships and show attainment of separation-individuation, cooperation, or reciprocity, with the suggestion of a high degree of autonomous functioning, mutual relatedness, and awareness of the other.

For example (Card 1): “This boy looks like he’s tired. I think he’s tired because... it looks like he’s looking at the instrument and he’s tired of playing it and he probably got into a fight with one of his family members because they want him to play but he don’t. [He’s thinking] what should I do? My parents want me to play the instrument and I don’t. What should I do? Should I tell them how I feel or should I just go along and play? He’s feeling confused and upset. Confused that he wants to listen to the parents but he’s upset because he don’t want to play the instrument. [In the future] I think he and his parents are going to work out a different arrangement where he can play another instrument or do whatever else he wants to do.”

As illustrated in the example above, the affective quality of the interaction does not need to be positively valenced in order to receive a 1. Though there is discord and conflict in the interaction, the child and parent are ascribed separate mental states that are elaborated upon and integrated into an interaction that, in this case, is ultimately collaborative. Such a resolution, however, is not necessarily intrinsic to a Level 1 response. The description of a highly charged verbal battle among equals that remains unresolved could be assigned a 1, despite significant disagreement, competition, or confrontation. It is only when the confrontation involves an imbalanced attack on one character by another that a more pathological score of 5, 6, or 7 is given.

The following is another example (13B): “This kid is supposed to be inside and all that he wants to do is go and play outside. So he’s sitting inside his house, at the door of his house looking outside. But he’s not allowed to go. So he’s thinking that he’s mad at his dad who’s not letting him go. And what led up to this is that he got in trouble for doing something so he can’t go outside. What’s going to happen is that he’s gonna run, he’s gonna go outside even though he’s not allowed to and he’s gonna get in even more trouble. So he’s feeling mad. And his dad is like, his dad doesn’t like punishing him but he does, he has to so his dad is upset at the same time.”

Here, the affective quality of the interaction is not positive; however, father and son are depicted in an elaborate and differentiated way. There is recognition that the other character is a separate
being with his/her own experience, and their emotional states bear some influence on the other character’s psychological state and/or actions.

**Scale Point 2: Parallel Activity-Simple Interaction**

Characters are engaged together in some relationship or parallel activity, but there is no stated emphasis or highlighting of mutuality. A response is scored 2 when the integrity of the objects is maintained and there is also no indication that this dimension is compromised in any way within the relationship. Despite the lack of direct emphasis on mutuality, the response still conveys potential for mutuality in the relationship. For example (Card 4): “These are two people in a movie, an actor and an actress, and they’re playing a dramatic scene in a 1950’s movie.” Here, the characters are portrayed as interacting with one another, but without any emphasis on each character’s autonomy and/or unique contribution to the interaction.

Characters described in parallel activity who are not engaged or aware of one another would not receive a 2. For example (Card 2): “I see a girl getting ready for school... I see a person, a man who can probably ride the horse. I see a man down there, a man all the way down there and next to him I saw a horse... The girl is probably thinking that she doesn't want to go to school. Um maybe the person right here, the guy right here, is probably thinking that he wants to ride the horse.” This description would not receive any score, for there is no recognition of the other characters, and they are not engaged or interacting in any sort of way.

The degree to which the unique contribution of each individual to the mutual interaction is highlighted is what distinguishes a score of 1 from 2. For example, the following response would receive a 2 (Card 1): “There was a boy. He was playing the violin. He got bored of the violin. The people think he needs a break. The people feel bad for him.” Here, the respondent describes the peoples’ awareness of the boy and aspects of his psychological state, while the boy is completely unaware of the other characters. There is no stated emphasis on the mutuality or reciprocal acknowledgement between the characters. If the boy were described in a way that conveys some recognition of the other characters (e.g. “The boy could tell by the looks of their faces that they saw his frustration”), the response would then receive a 1.

Finally, it is important to note that aggressive content in responses may also be scored a two if there is no power imbalance between the characters. For example, two people simply described as fighting would be scored a 2. Only if one figure has an unequal, controlling, or imbalanced advantage over the other is it then given a higher score.

**Scale Point 3: Anaclitic-Dependent**

Level 3 responses reveal a clearly dependent relationship in which the maintenance of self is highly related to sustenance from another person, suggesting difficulties in the cohesion of the self and the reliance on an external person for internal stability. Characters are portrayed as dependent on another, or without an internal sense of capacity to sustain themselves. The notion of autonomy is compromised and there is a stated or implicit sense that the characters cannot function independently without external support. For example (Card 18GF): “Maybe um the
lady, no wait, it's a child holding a lady. Um maybe the lady, probably the child's mother, is probably sick or dying. Maybe the lady collapsed in the stairs so she's helping her.”

Themes of illness and weakness in the context of being helped and/or taken care of by another person are common on the TAT, and often assigned a 3. For example, (Card 12M): “This person got sick and I guess this is the father...trying to help him feel better. What led up to this was a virus. In the future they're going to make sure that if something happens to their son, or he gets a cold or something, to treat him with the right medicine so it doesn’t get worse.” Stories that incorporate doctors, ambulances, police, or other characters in traditional helping roles, in such a way that is integral to the survival or wellbeing of an otherwise helpless character are also typical of level 3 responses.

The highlighted absence of an external object, without whom the character cannot manage on his or her own or function independently, is also indicative of a level 3 response. For example, on Card 1: “What's going on now is the boy is thinking about playing the violin. What happened right before this, he was doing his homework and he thought about music class and now he's trying he don't know how to use the violin. He got stuck. He's studying the violin because they are going to have a test. He is feeling that he wants to play the violin SO BAD but he don't have nobody to teach him.” Here, the emphasis on the boy's utter helplessness in the absence of a person he relies upon on highlights his dependency in such a central way that warrants a score of 3.

**Scale Point 4: Reflection-Mirroring**

The described relationship conveys a sense that the definition or stability of one character necessarily requires the other because it is merely an extension or reflection of the self. Some degree of fusion or lack of self-other differentiation between characters is central here. Characters are described as mirror-objects or are ascribed the exact same thoughts, feelings, and behaviors. For example, (Card 4): “This looks like a portrait of a husband and wife...they are having a good time. They're thinking I'm happy I'm here with you and I love you and stuff like that. Next I think they're about to go outside so they might go out and have some dinner.” Here, the individual experiences of the characters are merged in such a way that diminishes their respective sense of individuality.

While Scale Point 3 implies that autonomy is precariously bound to the availability of another person, the two characters are still regarded as separate beings with their own individual psychological states. Scale Point 4, on the other hand, fails to differentiate each character’s experience from the other. For example (Card 2): “These people sort of look shocked. So um, I think what happened before was this wasn’t here and they just came there because -- I see this guy -- he’s like looking, and like um, he looks shocked. They might be feeling shocked. Like surprised.” Here, characters lack any individual autonomy, and are depicted in such a way that their experiences merge into one undifferentiated affective response.

**Scale Point 5: Control-Coercion**

The nature of the relationship between characters is characterized by themes of malevolent control of one character by another. Level 5 describes intent, threat, or minor damage, and is assigned to responses depicting manipulation or coercion, one-sided fighting, or hurtful
influence. Such themes portray a striking imbalance in the mutuality of relations between characters. One or more characters may be seen as helpless, while at the same time others are omnipotent and controlling. For example (Card 12M): He is hypnotizing him. He is like when you hear someone snap their fingers, you will go on a rampage and say I like cheese. He went into his room while he was sleeping and probably hypnotized him. Like every time someone snaps their fingers or something he is going to be like, I like cheese!! He’s feeling evil and he’s feeling happy because he gets to eat cheese a lot, and he’s thinking cheese, cheese, cheese. In the example, coercion, manipulation, and control are expressed through the relationship of the hypnotizer being fully in control of his subject. This clear imbalance of power warrants a 5.

Level 5 is also scored when there is equal but malevolent threat or intent, such as two characters trying to kill each other, because this reflects the effort of one or both to dominate and destroy one another. Responses such as, people fighting, are usually scored as scale point 2 responses because there is no distinct reference to a loss of intactness of either character. However, “two people are fighting and bleeding from their forceful blows to one another,” would qualify as a scale point 5 because there is clear and distinct indication that either one or both of the characters have sustained some damage or violation of intactness, although not severe.

Another way for a story to qualify for a score of “5” is when a character is described as taking something from or doing something to another character without overtly damaging the controlled or used character. Similarly, aggression can occur without explicit description of the destruction to the victim. For example (Card 3BM): She’s in the bathroom putting her face in the toilet – toilet seat. Before she was getting picked on by kids. She’s feeling sad. She’s thinking she’s gonna hit the kids back and pick on them too. Here there is a clear imbalance in power in the interaction, as reflected by themes of control and domination without the “victim’s” body integrity being severely damaged.

Themes of loss and abandonment are commonly expressed on the TAT, and often reflect some level of relational imbalance and distress. Depictions of characters who are in a conventional caregiving role (e.g. parent, significant other) and abandon their responsibility to care for a dependent in such a way that threatens the dependent’s safety and well-being warrants a score of 5. Threats to leave or abandon the dependent, or emotional neglect of the dependent during intense distress are also worthy of a 5. For example (Card 13): “The boy is mad. He’s sitting in a farm – he lives in a farm. Before his mom kicked him out of her house. He’s thinking about going to the foster home and feeling mad.” Here, the mother’s clear violation of her responsibility to care for her son leaves him in an abandoned state, thereby imposing significant threat to his general wellbeing and safety.

6: Severe Imbalance-Destruction (threat carried out and destruction)

The characters are described as engaging in activity that is clearly destructive or parasitic, and that compromises the autonomy or integrity of the victim. Not only is there a severe imbalance in the mutuality of relations between characters, but the imbalance is cast in decidedly destructive terms (Coates & Tuber, 1988). Two characters simply fighting is not ‘destructive’ in terms of the individuality of the characters, whereas one character being tortured or strangled by another is considered to reflect a serious attack on the autonomy of the victim. Of note, characters depicted
as dying of a natural death, decaying, or aging would not receive a score because there is no malevolent other.

Malevolent one-sided aggression and domination is the major difference between responses receiving a scale point of 5 versus 6. Not only is there a severe imbalance in the mutuality of relations between characters in a “6” response; the imbalance involves a distinct perpetrator that caused damage or death. This contrasts a level 7 responses, for which annihilation results from an undefined, overwhelming force.

A malevolent character can be implied if only one damaged or destroyed character is depicted on the card. If someone is described as having been shot, it can be assumed that he or she was shot by a malevolent other. For example (Card 3BM): “I see a lady crying on a bench. I see keys on the floor. Wait that key looks like, never mind, that key looks like a weapon. Yeah that's a weapon. Maybe she got hurt or shot. ... probably inside a building. Maybe she's feeling hurt and probably furious cause it might hurt. Maybe she's wondering why her. It looks like a church because it looks like a church bench. Next maybe she'll try to get up but probably fall.” Even though this response does not explicitly reference a shooter, the woman was shot and harmed by a powerful and destructive character, which warrants a 6.

Depictions of relationships in which flagrant themes of abandonment, abuse, or severe neglect occur within the context of a caregiving relationship, leaving the dependent character in an extremely helpless, defenseless, and/or precarious state are assigned a score of 6. For example (13B): That kid is alone by himself. He thinks that he’s a lonely kid and he’s very, very small compared to the door... And then I think he’s feeling kind of sad that he's small, and he has no shoes, and he doesn’t have enough money to afford them. I think, before he probably, his family probably was not home and he was the only one. When he left for a few minutes, probably someone took stuff from his house. And now, his family got mad at him when they came back, and they told him to sit outside in the sizzling, burning hot sun. And then, and then next, the family might punish him for two years for letting him do that. Here, the severe neglect and abuse depicted towards this utterly helpless child deserves a score of 6.

7: Envelopment-Incorporation

Level 7 is assigned to pathological responses in which a character is or has been contaminated, dominated, overwhelmed, or destroyed by catastrophically malevolent, engulfing, or inhuman forces. Characters are seen as swallowed up, devoured, or generally overwhelmed by “forces completely beyond their control” (Urist, 1977). Explosions, fires, bombs, hurricanes, destructive forces of nature, alien invasions, warfare, etc. may be referenced, and characters are usually seen as destroyed, dead, mangled, evaporated or burned as a result. For example (Card 7BM): “This guy, he doesn't have any clothes on and he's tied up by a rope. He's hanging by a rope and there's all kinds of stuff in that hole that's gonna try and eat him up and he let go. He's dead and all the animals down - there eat him and snakes go up the rope and that man they ate all of him. He got ate up, all or him and he don't got no socks on and no shirt on and no pants and all the animals ate him up all in pieces and stuff and that man was dead forever!” Here, the level of parasitic envelopment and evisceration described is a perfect example of a Level 7 response.
APPENDIX II

Clinical Vignettes

The following four clinical case vignettes represent this author’s attempt to illustrate how attention, language, and intelligence factors are expressed through object representations on the Rorschach and Thematic Apperception Test (TAT). The author will also attempt to demonstrate the value of the MOA-TAT in terms of its ability to corroborate MOA data, while also offering insight into other dimensions of OR. Participants’ performance on attention, language, and intelligence measures are provided, along with their MOA and MOA-TAT summary scores, and excerpts from their Rorschach and TAT with corresponding MOA and MOA-TAT scores.

Case 1

This participant was an 8-year-old, English-speaking, Latino-American boy. His overall intellectual functioning was in the very superior range on the WASI (FIQ Sts = 133), with very superior abilities in the verbal domain and superior nonverbal/perceptual skills (VIQ Sts = 134; PIQ Sts = 125). Language abilities were found to be average overall on the CELF-4 (CLI Sts = 104), with high average receptive and average expressive skills (ELI Sts = 99; RLI Sts = 104).

He evidenced clinically significant ADHD symptomatology on the CBCL Attention Problems subscale (AP T-Score = 71), and moderate symptoms on the ADHD subscale (T-Score = 63).

The MOA and MOA-TAT summary scores for this participant are as follows:

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<th>MOA-TAT</th>
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</tr>
<tr>
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<td>2</td>
</tr>
</tbody>
</table>

As can be seen from this participant’s summary scores and excerpts from his projectives, the Rorschach and TAT evoked differential OR patterns that appear to be connected to his ADHD symptomatology. In general, this child revealed a relatively consistent pattern of more narcissistically oriented and pathological OR responses on the Rorschach. He appeared to be highly activated by the Rorschach, evidencing increased productivity of OR responses and a pattern of elevated aggression and malevolence on color cards, suggesting a propensity for aggressive outbursts when emotionally dysregulated. There is a rather remarkable shift in the quality of his OR responses on the TAT, which reflected greater identification with the victim rather than the aggressor, and were characterized by more dysphoria and anxiety, allowing for greater access to benign object representations. These notable differences illustrate how the two projective instruments and scales can tap into different dimensions of a child’s object representations and expand the range of OR functioning to be captured.
MOA Responses

Card III (MOA-4): Alien with two heads and they’re stuck together.
Card III (MOA-2): Two people talking, and they’re like fighting over a bow… they’re fighting as if over a crown.

Card V (MOA-4): It’s an alien bird and a butterfly connected together.
Card VII (MOA-4): It looks like two girls are connected together.
Card VII (MOA-6): [And WMLL mutant girl dogs?] The paws, the paws slash hands, and the piece, the piece that um. Two pieces, four pieces, one, two, three, four, five, six pieces.

Card VIII (MOA-6): This doesn’t look like anything but a mutant… and his arms are pointy and they’re like chop chop chop in people’s bodies… He’s stabbing them, stabbing them in the heart, its like chop chop squeezing the heart and stabbing it at the same time. [WMLL mutant?] Invisible face, and um this is the bones inside his body, this is skin, flesh, but his face doesn’t have anything! It’s invisible. That’s why. They don’t know where his face is so they can’t kill him.

Card IX (MOA-6): That looks like his sister (puts cards VIII and IX side by side)... she’s a mutant too. Cause bones are sticking out... and she has [ unintell] feet so when she steps on people... oh, you don’t want to know. That would be disgusting all right, cause, you know blood comes out, it’s like I’m a giant and I smash somebody like GRRRR! When she kicks she slices them.

Card X (MOA-6): That looks like your parents connected together. (MOA4)
Card X (MOA-6): [The parents] have a claw, and go like chop! Snaps them in half.
Card X (MOA-6): This is a herd of butterflies, that is like they are smashed.... Butterfly butterfly. That’s splatted splatted dead. And that is splatted, splatted [WMLL splatteed?] the blood, blood, blood, blood.

MOA-TAT Responses

Card 3BM (MOA-TAT-6): He’s feeling hurt. [Can you tell me a story about this one]. And before somebody was hitting him and he got hurt. And after he starts crying and then he’s thinking what am I doing to him, what am I doing to him and he feels like sad.

Card 4 (MOA-TAT-4): I can’t think of anything. [Take your time] ahhh [Can you sit back up in your seat]. Oh they’re going to get married. They got married after. [What happened before]. Before um they were coming in a cab. [What were they thinking]. They were thinking that where is the wedding rig and who is ring bearer and who is the flower girl. [And what are they feeling]. They are feeling like happy because they are going to get married, get it get married get it and get it get married.
Card 7GF (MOA-TAT- 3, 2): Oh, before the mother had a baby. [Tape got cut off]. [You were saying the second baby]. Second baby and um the girl’s holding the baby, him or her, I don’t know which kind, I don’t know which sex it is after he falls asleep her mother is like doing something, she has to do something. [What are they thinking?] Um they are thinking where should his room be [What are they feeling?] They are feeling like the boy the boy in the first one [Same face as the boy in the first card] Yeah like where should his room be [Where should his room be, ok] His or her room be, am I done with all of them?

Card 8BM (MOA-TAT-2): A doctor or before he was like this, the guy was like this, the patient [You’re pointing to the boy in the front]. Yeah, no that’s the patient’s son, and that’s the father of the boy and that’s the doctor and that’s another doctor. [OK] And after they’re going to cut him open, no before they cut him open but they are cutting him open right now, but before they were checking his heartbeat and his heartbeat was no heartbeat. It was like ummmmm, that means he’s dead and he’s going to die [What’s he thinking?] Only thinking anything [Ok, what’s he feeling?] painful cause he feels really painful for his dad and feels painful because he’s getting cut open. And after and after he um he’s sewing his body back closed, was that the last one.

12M (MOA-TAT-2): Ummm it’s like um this is the boy and the fathers the fathers, and before the father was not there and the boy’s there and after the father just left, and right now the father is right there saying hi to him and watching him and talking to him, he can still talk, and he’s thinking, he’s thinking what if he dies because he’s not talking anymore. When he leaves [what’s he feeling] he’s feeling sad because he doesn’t want his father to die.

13B (MOA-TAT-5): Oh I can see the first card again (laughs) wait a minute that boy looks familiar to him. [Yeah he looks like the boy in the first card]. No that’s him. [Well can you tell me a story about this one?] This one is like worried because um, because what is there is somebody out there that he doesn’t know and is going to steal him, like rob him, like take him. Before he was inside getting a glass of milk. Cause I see his face in a little white [And what happened after] After um, he went outside and then he went outside and then um he was sitting there and then left, left left like the house and went somewhere [Ok] Went to the park. [What’s he thinking] He’s thinking where is the park. Because he’s X which park I want to go to [What’s he feeling] He’s feeling like like the boy in the front [The boy on the first card] And like that girl with the baby where should his room be, her or his room be.

Case 2

This participant is an 8-year-old, bilingual, Latino boy who performed in the borderline range of intellectual functioning across WASI indices (VIQ Sts = 78, PIQ Sts = 75, FIQ Sts = 74). His receptive language abilities were also in the borderline range (RLI Sts =71), but in the context of average performance on the expressive and core language indices (ELI Sts = 99; CLI Sts = 96). He evidenced clinically significant ADHD symptomatology on the CBCL Attention Problems (T-Score = 71) and ADHD subscales (T-Score = 72).
The MOA and MOA-TAT summary scores for this participant are as follows:

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<td>PATH (5, 6, 7) Score Frequency</td>
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This participant’s relatively limited range of intellectual and language functioning constrained his ability to organize and articulate his responses to the Rorschach and TAT percepts, resulting in minimal and terse responses, which notably contained few references to affect and OR. Though he demonstrated an overall consistency in his production of malevolent-range OR responses, the Rorschach elicited unspecified anxiety responses that were forced into an object relational context on the TAT. Given this child’s perceptual and verbal weaknesses, the greater perceptual structure provided by the TAT enabled this child to organize and articulate his responses in a way that revealed slightly more insight into the threatening and rejecting quality of his object relational world.

**MOA Responses**

Card I (MOA-5): A mask, because it’s scary.


**MOA-TAT Responses**

Card 4 (MOA-TAT-2): She is in love with him. And he’s in love with another girl, and that she loves him but he doesn’t love her. And the rest of these pictures, I don’t know. Before he loved her, not he doesn’t love her. [Feeling] Don’t know. [Thinking] don’t know. [Future] don’t know.


**Case 3**

This participant was a 7 year-old bilingual, Latino boy whose overall intellectual abilities fell in the high average range (WASI FIQ Sts = 114), with superior perceptual reasoning and average verbal reasoning skills (PIQ Sts = 123; VIQ Sts = 104). He evidenced average to high average receptive and expressive language abilities on the CELF (RLI Sts = 110; ELI Sts = 103; CLI Sts = 100), and clinically significant ADHD symptomatology on the CBCL (AP T-Score = 71; ADHD T-Score = 71).
The MOA and MOA-TAT summary scores for this participant are as follows:

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<tr>
<td>PATH (5, 6, 7) Score Frequency</td>
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Interestingly, this participant exhibited a vastly different profile of OR than the other case examples of children with elevated ADHD symptomatology. This child’s OR responses are consistently in the benign range on both the Rorschach and TAT, with a tendency to portray parallel- and narcissistically-oriented interactions, reflecting an enjoyment of emotional connection and, at times, enmeshment with others. The absence of discernable OR disturbances raises interesting, albeit unanswerable questions, such as whether this child is predominantly inattentive and therefore lacks the heightened aggression associated with hyperactivity and impulsivity, or whether his familial and interpersonal relationships have provided more containment of his aggression (e.g. Card X: “claw inside a glass” suggests an internal buffer against aggressive impulsives). Nevertheless, the consistency of his OR responses across the Rorschach and TAT are notable and emphasize the corroboration the two scales can provide corroborating information, along with offering insight into other dimensions of OR.

**MOA Responses**

Card II (MOA-4): These look like butterfly wings together... (What are butterfly wings together?) It means attached. (Attached as if?) as if together.

Card III (MOA-1): Now that looks like two man facing each other… (facing each other as if?) As if having a challenge of cards. Like sitting down facing each other and putting down their cards.

Card VI (MOA-5\(^{38}\)): This reminds me of alligator heads… (WMLL alligator heads?) Because it looks like their mouths are opening (as if?) As if they are going to eat fish.

Card VII (MOA-1): And these two look like hands (WMLL hands?) … Like this hand is going this way and this hand is going this way (as if?) as if they were doin um … cause they’re doing this, they’re looking at each other like that (looking at each other as if?) as if they were playing a stick (what?) chess.

Card VIII (MOA-2): Hey these look like um tigers (WMLL tigers) These two remind me of a tigers really walk like that. (They’re walking as if?) As if they were um getting some food.

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\(^{38}\) It is the opinion of this author that this item should have received an MOA-2 instead of a 5, given that the emphasis is on the alligators eating, rather than harming or killing the fish.
Card X (MOA-2): These look like caterpillars (WMLL caterpillars?) cause they have those long tails (Anything else about them?) they’re looking at this claw inside a glass.

**MOA-TAT Responses**

Card 2 (MOA-TAT-4): People planting, planting fruits and vegetables. (Tell me a story about it.) … Like sometimes when the school and there’s a barn. And they got horses, there there there are people riding places and there’s hay. And there is one man over here near the hay. (What’s going to happen?) There gonna plant fruits. That’s what’s, that’s what’s they’re going to happen. They’re going to get some seeds. (What are they thinking?) About having food. (How do they feel?) Unhappy. (What led up to this?) The seeds.

Card 4 (MOA-TAT-4): They’re married because that’s the wife and that’s the dad. And they’re in a house with pictures and curtains. (What’s going to happen) They’re gonna get new, they’re going to have a baby. (What are they thinking?) Of, of, getting more stuff to move. (How do they feel?) Happy.

Card 7BM (MOA-TAT-2): She has a doll in her hands. Also there is a mom. And she gots a pen. And she’s sitting on a chair and she’s gots shoes. (What’s happening?) Her mom is telling her something. And she’s listening. (What’s going to happen?) She’s going to go up to her room and lay down on her bed. (What is she thinking?) She’s thinking of going to bed. (How does she feel?) Tired.

**Case 4**

This participant was an 8 year-old, English-speaking, Latina female with a full-scale IQ at the high end of the borderline range (WASI FIQ Sts = 79), with low average perceptual organizational and borderline verbal reasoning skills (VIQ Sts = 79; PIQ Sts = 84). She demonstrated borderline receptive language skills in the context of significant expressive language impairments that were also reflected by her core language index score (RLI Sts = 75; ELI Sts = 65; CLI Sts = 68). On the CBCL, this participant evidenced clinically significant attention symptomatology on the Attention Problems scale (T-Score = 70), but with normal range symptomatology on the ADHD subscale (T-Score = 54).

The MOA and MOA-TAT summary scores for this participant are as follows:

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<td>PATH (5, 6, 7) Score Frequency</td>
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Interestingly, this participant’s Rorschach and TAT responses are quite sophisticated in the context of her extremely low to borderline performance on intelligence and language measures. She was highly productive in terms of her OR responses on the Rorschach and TAT despite her apparent difficulties with verbal expression. Notably, the majority of her MOA and MOA-TAT
scores are in the benign range, and there is a cheery quality to several of her response. Nevertheless, the pattern of OR responses and thematic content reveal a preoccupation with issues of dependency and fears of abandonment that are highly consistent across the Rorschach and TAT. Thus, though her linguistic weaknesses do not interfere with her response productivity, they may contribute to heightened feelings of vulnerability and dependency, which may have driven her to conjure up so many object representations.

**MOA Responses**

Card II (MOA-2): It looks like two elephants with lights on them, and on the bottom.

Card III (MOA-2): They look like people holding a basket... (as if) they were picking, um little seeds for them to grow apples
Card III (MOA-3): And then these people are hanging from a string (as if?) they’re jumping up and down like that, and it looks like they did it for a performance for a lot of people to see that.

Card IV (MOA-5): It kinda looks like an evil kind of like flying ocean evil thing.
Card IV (MOA-3): And it looks like a bat in the middle here [And this little thing looks like a bat?] No, that little thing, I forgot it was a tongue... and this is a little thing hanging down, that’s kind of like if it... that’s its, um, that’s its thing to say its hungry.

Card VI (MOA-4): This looks like a fox dog... and this is just the heart of it [WMLL the heart] it makes it look like a heart like if it was going to be attached, and that’s what makes it look like a heart, and these are the little things that he ate, those little white things.

Card VIII (MOA-3): This looks like a fish, with two pink fishes on the side... right here, and these are two pink fishes, and it looks like the fish is holding.
Card VIII (MOA-5): And this is like a robot kind of like where you press things inside of it to make it do whatever you want it to, and it’s for any kind of persons.

Card IX (MOA-1): These look like wizards blowing their horns [as if?] they were at a zoo and trying to make a performance for every child who was there.... And then the children are laughing.
Card IX (MOA-4): And there are little people inside. This is one of them, and they’re in dressy outfits, and this one is attached to that one, and that one is attached to this, but they’re both, all three of them are attached.
Card IX (MOA-3): These are the, these are the hands for the mask is on of these, that’s what they’re holding.... That looks like a mask of part of it and that’s their hand hold it.

Card X (MOA-1): This is a man... and it looks like he’s clapping with things on his hand like this.... And these look like little dear coming out, so he’s a magic performance kind of like [performing as if?] he’s performing at a school that um someone said to the principal this guy should do it because he looks like he can do a good performance around the children too, and it looks like the children are going to like it.
MOA-TAT Responses

Card 2 (MOA-TAT-2): This looks like a woman who looked at the other woman because she felt bad for the woman that she always stooded there, for many days. And the woman was looking and carrying her books, and thought that she should help them. And the guy worked very hard to take the horse and make him do all this (points to field), to plant something. And this is the little thing that goes like that. [And what happened before?] Before um, before she was reading this book, and she was walking out from here and then going here, and after she put the book down and then she looked at the woman and felt bad for her because she stayded there for many nights and many mornings. [And what’s gonna happen after?] And after she, the woman, her, the one that felt bad for the woman, she walked out here, she was reading her book, and then she put the book down and holded it, and then she looked at the woman, this one, with the thing on its head, and she felt bad that she stayded there for a long, long time, because they had to it night and morning.

Card 3BM (MOA-TAT-5): This looks like a girl, a grown-up, and she is on the couch crying because she can’t find her, her son. And what she found on the ground was a pair of keys. And also she had had a skirt, a shirt, and this is her hair, and then this is the couch, and that’s her feet, that’s her hair, and that’s her hand and those are the keys. [And what happened before?] Before her son was home, he was home and then he disappeared after. [And what’s gonna happen after?] After, she she, her son was home, and he was at home looking for his mom, and then his mom came home, and then all the sudden he disappeared and dropped his keys by her, and now she’s crying on the couch. [And what’s she thinking?] She’s thinking of finding her son. [And what’s she feeling?] She’s feeling like she should do something about it.

Card 4 (MOA-TAT-1): It looks like, um...um his daughter, and his daughter is saying that she has to move somewhere, and he’s getting upset and he looks away, and she holds him and says that she has to because she can’t stop, because someone is forcing her to go there for a job. [And what happened before?] Before um she said that she had to move. [And what’s gonna happen after?] And after she, she was at school and then someone told her that she had to, we have a job for you. And she said okay, and then she went home, and then she told her father. [And what she thinking?] And she’s thinking of not moving because of her father. [And what’s she feeling?] She’s feeling very, very happy if she moved, to get a job. [Note: Subject and mother planned to move to Florida a month after this testing, and the father did not plan to join them.]

Card 7GF (MOA-TAT-5): This looks like...a mother, a maid and a daughter. And the daughter is holding the doll, sitting on the couch, thinking of her mother and father. And the maid is cleaning up. [And what happened before?] Before she was looking out the window thinking about her mother and father. [And what happened after?] After her mother and father went to Mex...they went to Texas, and they never came back for her. [And what’s she thinking?] And she’s thinking of going to, when she grows up she’s thinking when she grows up she’ll find them and she’ll fly to Texas and see if she can find them. [And what’s she feeling?] She’s feeling that when she’s a grown-up she can do something that will make her feel better if she went to go see her parents...at well, if they are not dead, or if they had live, but they never came back for her.

Card 8BM (MOA-TAT-6, 2): This looks like they’re going to...kill someone. And the boy, that’s
his, that’s the dad and that’s the boy whose a young boy now, and he’s sixteen, and he and he was peeking right here but the man couldn’t see, the mans couldn’t see him, so he turned around away and then that’s the knife, and that’s the man cutting him up, and that’s the light, and that’s the father. [And what happened before?] Before he, they caught him sneaking around the house, um the man, his father, so they decided that they were going to cut him open, and the man was screaming for his son but the son turned away because he didn’t want to get killed. [And what’s gonna happen after?] After they were at home having a, they were watching TV. [And what’s he thinking?] Who? [The boy.] The boy is thinking of that he shouldn’t die because he wants to have a chance to live. [And what’s he feeling?] He’s feeling very sad for his father because he is a young man and now he has nowhere to go and he doesn’t have money or anything, but his mother is at home so he will ask her.

Card 12M (MOA-TAT-2, 3): This one looks like um...a guy. And this is his sister, and she is touching her faces because because he feels bad for her because there’s something wrong with her heart and she fell asleep, and so he’s the brother, he is just putting his hand on her face because, because he feels sorry for her. [And what happened before?] Before the man was at the hospital and he touched her face. [And what’s gonna happen after?] And after she was alive with him, and they were, they were at some party and all the sudden they went home and then she had a bad heart. [And what’s he thinking?] And he’s thinking of, bringing her back and asking the hospital to bring her back and try their best to bring her back because she won’t wake up.

Card 13B (MOA-TAT-2, 3): This looks like a boy who was sitting on a porch, and he’s thinking about his nanny and of his mommy and his grandpa, but only his daddy is with him, so before his mom, his grandpa, and his grandma went to Mexico. And what happened is that they stayed there and they broke, they broke a piece of his key to make sure that he’ll always remember that piece of key, and they will come back for him, and put the key back together, make sure that’s it’s a family again. But his father took very good care of him. [And what’s gonna happen after?] And after his mother and his grandpa and his grandma went home with his daddy but then all the sudden they had bad news for mom, the mom had to go to Mexico, and the grandpa had to go and the grandma had to go, and not the father, and left. [And what’s he thinking?] And he’s thinking of, if they’re ever gonna come back for him and going to make sure that they always come back. [And what’s he feeling?] He’s feeling kinda sad because he doesn’t have them there, because his grandma used to put him asleep with a song, and his daddy doesn’t do that, and his mommy used to read him a story but now she, now he doesn’t, his father, and his grandpa used to play with him but his daddy doesn’t play with him sometimes.
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