Do Social Communication Skills Mediate the Relation Between ADHD Symptoms and Relationship Satisfaction?

Erin Clarke Bell
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DO SOCIAL COMMUNICATION SKILLS MEDIATE THE RELATION BETWEEN
ADHD SYMPTOMS AND RELATIONSHIP SATISFACTION?

by

Erin Clarke Bell

Abstract of a Dissertation
Submitted to the Graduate School
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

August 2014
ABSTRACT

DO SOCIAL COMMUNICATION SKILLS MEDIATE THE RELATION BETWEEN
ADHD SYMPTOMS AND RELATIONSHIP SATISFACTION?

by Erin Clarke Bell

August 2014

Very few studies have examined adult attention-deficit/hyperactivity disorder (ADHD) and relationship satisfaction. The current study focused on ADHD symptoms, social communication skills, and relationship satisfaction. Based on previous research that provides evidence that individuals with ADHD tend to have more difficulty with both receptive and expressive social communication skills as well as the large amount of evidence that communication is a key component to relationship satisfaction, it was expected that higher ADHD symptoms in one partner of a romantic dyad would relate to less relationship satisfaction. Furthermore, because ADHD is associated with a positive illusory bias (PIB), it was also predicted that couples may experience less satisfaction through partner discrepancy and that an individual’s lower motivation to improve impacted social communication skills. The sample for the current study consisted of 75 couples. First, the study examined whether the relation between target and partner relationship satisfaction was attenuated by targets’ ADHD symptoms. The study also examined whether targets’ ADHD symptoms were negatively correlated with target and partner relationship satisfaction—as well as positively correlated with a discrepancy between targets’ self-ratings and partners’ ratings of targets’ social communication skills—through partial correlations. Finally, mediational analyses for indirect effects were conducted to examine if partners’ ratings of targets’ social communication skills (or
the discrepancy between targets’ self-ratings and partners’ ratings of targets’ social communication skills) would mediate the relation found between targets’ ADHD symptoms and relationship satisfaction. The hypotheses proposed were mostly unsupported. However, there was some evidence for a significant negative correlation between targets’ ADHD symptoms and their partner’s relationship satisfaction.
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by

Erin Clarke Bell

A Dissertation
Submitted to the Graduate School of The University of Southern Mississippi in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

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August 2014
DEDICATION

As I have struggled through the challenges in earning my doctoral degree, I have had so many strong women in my life to support me and encourage me along the way. This work is dedicated to you all who have been there through to the final steps of this marathon. Further, I would like to thank a few women in particular:

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To my friend, Sara Johnson, who has been a great friend from day 1 to day 2,190 of graduate school.

Thank you all for being women who I look to and for being women of strength. Without you all, this would not have been possible.

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CHAPTER I
INTRODUCTION

Attention-deficit/hyperactivity disorder (ADHD) affects an estimated 8% to 9% of children, with at least 50% of these individuals still meeting criteria for the disorder as adults (Bidwell, McClernon, & Kollins, 2011). The Diagnostic and Statistical Manual for Mental Disorders (DSM-5) outlines the criteria for ADHD classified within three major symptom domains of inattention, hyperactivity, and impulsivity as well as an age of onset (before age 12 years) and clinically significant impairment within at least two settings (American Psychological Association [APA], 2013). The behavioral symptoms that are diagnostic of ADHD are related to many associated deficits in performance and behavior and have most often been explained by a theory of overall deficits in executive functions (EFs; Barkley, 1997). Some of the executive function deficits that have been identified in ADHD are emotional, cognitive, and behavioral dysregulation, deficient interference control, and overall slow processing speed (Bidwell et al., 2011; Vadala, Giugni, Pichiechio, Balottin, & Bastianello, 2011), which could all be linked to causing problems in communication and social interactions (e.g., Charman, Carroll, & Sturge, 2001). A core feature of ADHD, behavioral disinhibition (Barkley, 1997), may also be responsible for social skills deficits seen in individuals with ADHD. The social impairments often related to the symptoms of hyperactivity and impulsiveness such as interrupting, impatience, or restlessness could be interpreted as rude behavior. The social deficits attributed to symptoms of inattention such as obvious distraction or poor eye contact could be seen as someone being uninterested or uncaring (Friedman et al., 2003).
Additionally, another possible contributing factor for negative social interactions among individuals with ADHD is the tendency for these individuals to demonstrate a “positive illusory bias” (PIB; Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007) in their self-perceptions (Linnea, Hoza, Tomb, & Kaiser, 2012). The term “positive illusory bias” refers to a self-inflated discrepancy between an individual’s self-report of performance or competence compared to their actual performance or competence based on others’ perceptions or some objective criterion (Owens et al., 2007, p. 335). Research has shown that children with ADHD demonstrate less social insight and less accuracy in assessing their own social competence (e.g., Hoza, Waschbusch, Pelham, Brooke, & Milich, 2000). The combination of being more socially impaired but also less aware of these deficits due to an overestimation of performance could substantially impact interpersonal relationships.

Although most ADHD research has focused on children, several studies also document the impairment that adolescents and adults tend to experience across areas of functioning, including their interpersonal relationships, academic achievement, and occupational performance (Weiss & Hechtman, 1993). Research on ADHD among adults is imperative given its high prevalence rate. Barkley, Murphy, and Fischer (2008) concluded that an estimate of nearly 5% of the general population of adults meet criteria for a diagnosis of ADHD. Two longitudinal studies conducted by Barkley et al. (2008) followed children diagnosed with ADHD into young adulthood and found that as adults, the sample with ADHD had more difficulty in several major domains of performance including education, home responsibilities, occupation, money management, daily
responsibilities, dating/marriage, and social activities when compared to the community control group.

Although such research demonstrates that adults with ADHD often experience social deficits, including within romantic relationships, a paucity of studies exists that examine how these deficits impact outcomes for and satisfaction in those relationships. To further build upon this literature, this study examined differences in relationship satisfaction in relation to ADHD symptoms. Furthermore, the study examined whether any differences found in relationship satisfaction associated with ADHD symptoms were mediated by social communication difficulties and/or a positive illusory bias.

ADHD and Social Cognition

The symptoms of ADHD, defined as the behavioral expressions associated with the disorder, may cause impairment in several areas of performance (Barkley et al., 2008), including an individual’s social cognition (Bidwell et al., 2011). Social cognition involves several processes implicated in understanding other individuals, including encoding of social information, interpretation of social cues, perception of emotion from faces, empathy, humor, and theory of mind (i.e., the ability to reason and attribute mental states to oneself and to others; Uekermann et al., 2010; Uekermann, Channon, & Daum, 2007). An individual with ADHD may experience problems in any one of these areas, leading to a less successful social exchange with others. Indeed, many authors have noted social deficits in children and adolescents (Barkley, 1997; Biederman et al., 1996). These deficits in children diagnosed with ADHD are far-reaching in impact by interfering not only with their interactions with peers, but also with the child’s interactions with his parents, siblings, and teachers (Singh et al., 1998). It was stated by Hinshaw (1992) that
“the interpersonal problems of children with attention-deficit hyperactivity disorder (ADHD) may well constitute the most salient and debilitating aspects of their psychopathologic behavior” (p. 539).

These social deficits in children with ADHD appear to be at least partially rooted in problems with social cognition. For example, studies examining children diagnosed with ADHD compared to typically-developing children on facial emotion recognition tasks have found that children diagnosed with ADHD typically perform worse than the control comparisons (Casey, 1996; Corbett & Glidden, 2000; Katz-Gold, Besser, & Priel, 2007; Singh et al., 1998; Yuill & Lyon, 2007). However, one study (Shapiro, Hughes, August, & Bloomquist, 1993) found no differences between the ADHD sample and the control sample in ability to process emotional cues on visual tasks but did find deficits associated with ADHD on complex auditory processing. Deficits in emotion perception have been documented not only in children with ADHD (Corbett & Glidden, 2000), but also in boys at risk for ADHD (Katz-Gold et al., 2007). For example, in a task in which boys with ADHD and boys without ADHD matched emotional stories with faces displaying emotions, the group with ADHD performed worse than the control group (Yuill & Lyon, 2007).

Additionally, Casey (1996) found that children with ADHD were less accurate than undiagnosed children in identifying both their own emotional expressions and their study partner’s emotional expressions. A study by Fonseca, Seguier, Santos, Poinso, and Deruelle (2009) examined the ability of children and adolescents with ADHD to not only recognize facial emotion, but also to use context-based emotion recognition. They confirmed the previous findings by other researchers of a diminished ability to recognize
emotional facial expressions, but they also added to the literature by finding less accuracy among individuals with ADHD in using contextual information to understand emotions. A study by Moore, Hughes, and Robinson (1992) examined information processing abilities in hyperactive-rejected, hyperactive-accepted, non-hyperactive rejected, and non-hyperactive accepted boys. They found that the hyperactive-rejected boys in the study displayed information-processing deficits that differed from the non-hyperactive rejected boys. Further, they exhibited excessive encoding and cue deficiencies compared to the other groups. This study provides another link regarding how social cognition deficits may lead to less successful social interactions. The child and adolescent literature provides substantial support for a propensity for social cognition deficits among children with ADHD that may impede social communication, but there are far fewer studies examining social cognition in adolescents and adults with ADHD.

Although fewer in number, the existing studies examining social cognition among adolescents and adults with ADHD suggest that individuals with the disorder often continue to struggle with social cognition impairments beyond those experienced in childhood. Becker, Doane, and Wexler (1993) investigated hemispheric functioning in processing positive and negative emotional words, using the right ear advantage (REA) to test how ADHD may interfere with word processing in adolescents with ADHD. The REA is the idea that words presented in the right ear have a greater likelihood of being heard because the final processing of language usually occurs in the left hemisphere of the brain (Zatorre, 1989).

Becker and colleagues (1993) administered 10 participants with ADHD and 11 participants without ADHD a dichotic listening task in which words were presented in
pairs consisting of combinations of negative, positive, and neutral words. For example, in the negative/positive condition, a participant was simultaneously presented with the words gun/fun in different ears. Findings showed that non-ADHD participants had higher right ear advantage than participants with ADHD when the positive condition (positive words) was presented. Specifically, the participants with ADHD had slower reaction times when positive stimuli were presented in their right ear. Becker et al. (1993) concluded that individuals with ADHD might not process positive emotional stimuli as easily as individuals without ADHD.

The results of the Becker et al. (1993) study have led some researchers to question whether individuals with ADHD tend to have slower reaction times due to a cognitive distortion problem in which they have more difficulty in processing positive emotions (Uekermann et al., 2010). It is commonly known that positive emotions are crucial to the success of romantic relationships (e.g., Carrere & Gottman, 1999). If individuals with ADHD are likely to have more difficulty processing positive statements versus negative statements from their partner, they may find themselves less satisfied in a relationship than someone who equally processes negative and positive statements.

Rapport, Friedman, Tzelepis, and Van Voorhis (2002) examined emotional experience and perception of affect among 28 adults with ADHD and 28 adults without ADHD. Participants completed the Affect Intensity Measure (AIM), which is a self-report measure examining an individual’s intensity of emotion experience. The AIM assesses for a stable trait of emotional reactivity that represents a general temperament in an individual (Rapport et al., 2002). Items on the AIM measure typical responses on a 6-point Likert scale to different situations (e.g., “Sad movies deeply touch me”) and to an
individual’s evaluation of their own emotional reaction (e.g., “When I do feel anxiety it is normally very strong”).

Specifically, Rapport et al. (2002) predicted that adults with ADHD would experience heightened emotional reactivity, based on Barkley’s (1997) theory that deficits in response inhibition could lead to a more intense internal experience of emotion for individuals with the disorder than those without it. The participants were also shown photographs of faces portraying a certain emotion and had to select which emotion was portrayed from a choice of six categories. The researchers measured correct identification of emotion, response time, ratings of the intensity of the emotions depicted, and confidence in the answer chosen. Rapport et al. (2002) also administered a parallel task in which participants identified the correct category of an animal (dogs, cats, birds, primates, bears, and fish) picture displayed as a control condition to assess whether any group differences between participants with ADHD and the control participants were affect-specific (which would impact performance on the emotion identification task only) versus being due to general symptoms of ADHD (which would impact performance on both identification tasks).

The researchers found that participants with ADHD experienced heightened emotional reactivity on the trait measure (AIM) and performed worse on affect recognition in comparison to the control participants. To determine the role of impulsivity on response time, Rapport et al. (2002) examined reaction time in regard to accuracy. They found that participants with ADHD took significantly longer to select the emotion displayed and made more errors in affect recognition than the control participants. However, on the animal trial (not related to emotion recognition), the two
groups had statistically equivalent response times. Furthermore, correct responses on the affect identification task were not related to reaction time for participants in the ADHD group. Rapport et al. (2002) concluded that, although participants with ADHD have lower accuracy and slower reaction times in affect recognition on average, it is unclear what is causing these deficits. They argue that the more intense internal, emotional experience reported by participants with ADHD may have distracted them from processing external information correctly and efficiently. Based on their longer response times, it is also possible that participants with ADHD were not processing all of the information presented as quickly as the control group did; if offered a longer stimulus presentation time, they may have performed better.

The evidence that reaction times were not related to accuracy provides support that it likely was not impulsivity that contributed to lower accuracy rates but that individuals with ADHD were likely slower in processing the stimuli, which were presented quickly (200 ms), leading to lower accuracy when compared to the control group (Rapport et al., 2002). The same impairment may not have been evident on the animal categorization task because it may have been easier to recognize the category of an animal more quickly and accurately than an emotion displayed on a human face. Regardless of the cause of inaccuracy in assessing an emotional display, such problems may lead to decreased relationship satisfaction among couples in which there is one partner with ADHD, particularly if these misinterpretations of affect lead to miscommunication.

To build on the Becker et al. (1993) and Rapport et al. (2002) studies, Friedman et al. (2003) evaluated both social and emotional competence in adults with ADHD,
including assessing for the participants’ self-perception or awareness of their own competence in these areas. Participants were 31 adults with ADHD who were recruited from an ADHD clinic and 32 adults without a history of ADHD who were recruited from the local community. Participants completed several self-report measures, including the Social Skills Inventory (SSI; Riggio, 1986), which assesses social communication skills in the following six domains: emotional expressivity, social expressivity, emotional sensitivity, social sensitivity, emotional control, and social control. They also completed The Toronto Alexithymia, which assesses for general deficits in emotional vocabulary. According to Friedman et al. (2003), alexithymia describes a deficiency in the ability to communicate feelings, identify emotional feelings, distinguish between emotional states and physical sensations, and process emotion meaningfully (Bagby, Taylor, & Parker, 1994; Lane et al., 1996). Participants also viewed film clips that depicted emotional interactions between two characters and described what occurred during the film segment and rated the intensity of the emotions displayed by the actors.

The results of the Friedman et al. (2003) study provided evidence that impairments in both social and emotional competence are associated with ADHD in adults. Levels of alexithymia were found to be significantly greater in the adults with ADHD over the control group. Similar to the child literature reviewed earlier, adult participants with ADHD also demonstrated less ability to detect emotions accurately in interpersonal interactions. In addition, expressive deficits surfaced in their descriptions of emotional scenes. Participants with ADHD had a greater amount of total words used but a lower number of emotional words. Finally, evidence from the self-report measures indicated that the adults with ADHD were aware of the problems they had in regulating
social and emotional *expression*; however, they were unaware of the deficits they appeared to have in the area of accurately recognizing emotions (reception) in others and in expressing emotions effectively. Friedman et al. (2003) offered a possible explanation that adults with ADHD may be more aware of the expressive deficits due to the social feedback they receive from others throughout their life. They postulated that individuals are more likely to receive social feedback on the regulation of their behavior than their difficulty accurately assessing and expressing emotion. This unawareness of emotional deficits could be evidence of the presence of a positive illusory bias interfering with accurate self-assessments of performance by the participants with ADHD. Deficits in the area of detecting emotions and verbalizing emotions would most likely lead to social communication deficits and interpersonal problems. Furthermore, the finding by Friedman et al. (2003) that adults with ADHD were generally unaware of their own difficulties in accurately recognizing and expressing emotions could create another point of tension for couples in romantic relationships. If the partner with ADHD overestimates his or her own ability at emotional recognition and expression, the non-ADHD partner could become frustrated by the partner’s lack of motivation to change. It is possible that the discrepancy between an individual’s rating of himself in social communication and his partner’s rating of social communication could predict less relationship satisfaction due to such tension.

In summary, based on the research reviewed, individuals with ADHD, on average, have more difficulty in both expressive and receptive areas of social and emotional competence. These associated deficits involve heightened emotional reactivity, difficulty in accurate facial emotion recognition, and impaired emotional expression. All
of these social communication skills are critical in successful social exchanges, particularly in interpersonal communications within romantic relationships; therefore, it is likely that there is a significant negative impact on romantic relationships when one of the partners’ communication skills are lacking. To further build on the literature in this area, this study examined differences in social communication skills between individuals’ ADHD symptoms levels as well as whether such skills mediate the relation between ADHD symptoms and relationship satisfaction.

Positive Illusory Bias

Given the propensity toward a PIB in functioning across various domains that has been linked to ADHD, it appears to be important to consider not only social communication deficits among individuals with ADHD, but also how a PIB in social communication among individuals with ADHD symptoms may relate to relationship satisfaction. As previously described, there is a strong research base that supports the idea that children with ADHD often possess a positively biased self-perception that has been coined a “positive illusory bias” (for a review see Owens et al., 2007). Research has suggested that children with ADHD are more likely to experience peer rejection than non-ADHD peers (Erhardt & Hinshaw, 1994; Pelham & Bender, 1982). Despite more difficulty in multiple domains (i.e., social, academic, behavioral), research evidence suggests that many children with ADHD overestimate their own performance compared to objective measures (Hoza, Pelham, Dobbs, Owens, & Pillow, 2002; Hoza et al. 2004; Owens et al., 2007). However, the question remains whether an overly positive self-bias in social communication would serve as a possible risk or protective factor (Linnea et al., 2012)—a question which no known studies has examined in the relationship satisfaction
Some research suggests that a PIB could positively influence individuals by protecting self-esteem (Diener & Milich, 1997; Taylor & Brown, 1988), which in turn could encourage persistence at tasks for which they have experienced previous failure (Bjorklund, 1997). However, other research indicates that it could negatively affect an individual by decreasing their motivation to improve their performance because they are unaware of their own deficits (Milich & Okazaki, 1991). If the latter is true and a PIB does decrease motivation to improve social performance due to a lack of awareness of deficits, relationship satisfaction among couples in which a partner has ADHD will most likely suffer.

Recently, when examining the relation between a PIB in social behaviors and negative social interactions among children, PIB has been studied in a way that teases out the contribution of a PIB alone from the negative behaviors related to core ADHD symptoms (Kaiser, Hoza, Pelham, Gnagy, & Greiner, 2008; Linnea et al., 2012). Linnea et al. (2012) examined the role of a PIB in social behaviors among 87 children by comparing groups that consisted of participants with a combined ADHD and PIB status, ADHD alone status (no PIB present), and control children in a laboratory-based dyadic social interaction task. They found that both ADHD groups were more disruptive than the control groups; however, the children with ADHD combined with a positively biased self-perception displayed significantly less prosocial behavior and less effortful behavior in their interactions. Furthermore, this group displayed less overall positive emotion and was rated as less friendly, less responsive, and less engaged. Thus, the presence of a PIB appeared to exacerbate the negative impact on social relationships for children with ADHD.
Although most research has been conducted on children, there is some evidence to indicate that a PIB continues to be present in the adult ADHD population as it has been demonstrated in the self-assessments of adults with ADHD when rating their abilities in recognition of facial expressions (Rapport et al., 2002), awareness of social competence (Friedman et al., 2003), confidence ratings after a time estimation task (Prevatt, Proctor, Baker, Garrett, & Yelland, 2011), evaluation of driving behaviors (Knouse, Bagwell, Barkley, & Murphy, 2005), and, recently, self-evaluations of work and driving (Prevatt et al., 2012). There is also evidence that enhanced self-perceptions in adults negatively influence their social interactions (Colvin, Block, & Funder, 1995).

Colvin et al. (1995) conducted a study on a community sample of college-aged men and women in which they found that negative social behaviors were significantly associated with enhanced self-perception. In their study, they found men with an enhanced self-perception often bragged, interrupted, spoke quickly, and talked at rather than to their partner during the laboratory social interaction. Women with the enhanced self-perception demonstrated irritability, awkward interpersonal style, skepticism, and approval-seeking behavior (Colvin et al., 1995). Such findings combined with the ADHD and PIB literature suggest that many adults with ADHD will likely also have an overly positive self-evaluation of their own social communication skills, and this discrepancy between their own evaluation and actual performance may decrease both positive social interactions and relationship satisfaction among couples.

Furthermore, recent studies examining relationship satisfaction among couples found that perceptual accuracy for ratings on specific relevant traits (Gill & Swann, 2004) and on broad personality traits (Decuyper, De Bolle, & De Fruyt, 2012; Letzring &
Noftle, 2010) was positively associated with relationship satisfaction. Decuyper et al. (2012) define perceptual accuracy as the agreement between a self-rating and an informant rating on some personality trait. It appears that discrepancies of perception may lead to more tension and less satisfaction in relationships in general. Given that adults with ADHD may have an inaccurate view of themselves due to inaccurate assessments of self, there is also a potential for more partner discrepancies in perceptions of the ADHD partner’s skills and subsequently less satisfaction in the relationship. The current study aimed to examine this possibility by determining whether a PIB in social communication skills exists among the individuals with higher ADHD symptoms (relative to partner perceptions) and whether such a PIB mediates the relation between ADHD symptoms and relationship satisfaction.

Communication and Relationship Satisfaction

Research has demonstrated that a couple’s communication is significantly related to the satisfaction partners experience with their relationship. In fact, communication problems are most frequently listed as the main relationship difficulty in community surveys (e.g., Cunningham, Braiker, & Kelley, 1982) and are the chief complaint of couples entering therapy (Geiss & O’Leary, 1981; Hahlweg, Revenstorf, & Schindler, 1984). A couple’s communication being related to satisfaction in the relationship has been demonstrated both in cross-sectional and longitudinal studies (Carrere & Gottman, 1999; Gottman & Krokov, 1989; Gottman & Levenson, 1992; Litzinger & Gordan, 2005; Markman, 1979, 1981; Rogge & Bradbury, 1999). Although communication is often thought of as the verbal content between two parties, communication skills encompass more than verbal discourse. In fact, past research suggests that nonverbal codes are more
effective discriminators between distressed and nondistressed couples (Gottman, 1979; Gottman, Markman, & Notarius, 1977). Some evidence suggests that within nonverbal communication, it is the accuracy of *decoding* the nonverbal messages more than *encoding* nonverbal messages that predicts marital satisfaction (Gottman & Porterfield, 1981; Koerner & Fitzpatrick, 2002; Noller, 1992). Additionally, couples that lack skills in regulating emotional expressiveness and successful communication are likely to have less relationship satisfaction or relationship success (Carrere & Gottman, 1999; Litzinger & Gordan, 2005). The evidence that individuals with ADHD often experience difficulty in affect recognition compared to non-ADHD individuals leads to the possibility that they would have more difficulty in nonverbal decoding and accurate affect recognition in their romantic relationships. Specific research examining communication between couples may highlight difficulties that would be exacerbated in individuals with a high level of ADHD symptoms.

A study by Koerner and Fitzpatrick (2002) examined nonverbal encoding and decoding of positive and negative affect in both relational and nonrelational messages as they related to marital satisfaction. Within the laboratory setting, 64 married couples were asked to communicate different emotions using the same sentences, allowing the researchers to examine how spouses utilized nonverbal cues to communicate an intended emotion. Each spouse also rated their confidence in their own encoding and decoding of messages to assess awareness of their own abilities in nonverbal communication skills. Finally, each spouse rated his/her own marital satisfaction using a standardized questionnaire. Koerner and Fitzpatrick (2002) found that accuracy in decoding nonverbal affect was associated with the *partner’s* marital satisfaction but did not relate to one’s
own marital satisfaction. They also found that, for both spouses, accurately decoding relational positive affect and nonrelational negative affect was associated with more marital satisfaction. Participants’ own assessment of their abilities to communicate nonverbally did not correlate with their actual skills. This discrepancy between their own assessment and performance could create more frustration between partners if both partners believe they are effectively communicating.

Carrere and Gottman (1999) successfully predicted relationship success by coding 124 newlywed couples’ interactions and communication during a marital conflict discussion about a major area of continuing disagreement. Later, coders categorized the affect displayed by couples during these videotaped discussions, using five positive codes (joy, humor, affection, interest, validation), 10 negative codes (disgust, contempt, anger, domineering, belligerence, whining, sadness, stonewalling, fear, tension), and a neutral affect code. It was found that the affect displayed between a husband and wife in the first three minutes of the conversation was predictive of their marital outcome six years later. The couples that divorced six years later were found to have fewer expressions of positive emotion and more expressions of negative emotion. The authors concluded that for both husbands and wives, the very beginning of the conflict discussion is critical in predicting stability in the relationship.

The findings from both the Koerner and Fitzpatrick (2002) and the Carrere and Gottman (1999) studies could be important in relation to communication among couples in which a partner has ADHD symptoms. As discussed earlier, some studies (Friedman et al., 2003; Rapport et al., 2002) have shown that individuals with ADHD often have more difficulty in accurately recognizing facial affect. Misinterpretations of affect could
lead to an escalation in a conflict discussion or less satisfaction in the relationship. Additionally, the finding by Becker et al. (1993) that individuals with ADHD have more difficulty processing positive emotional stimuli than non-ADHD individuals may be key in an individual with ADHD failing to recognize his or her partner’s positive emotional displays during a conflict discussion, which could make relationship dissatisfaction particularly more likely among couples in which one partner has a high level of ADHD symptoms.

Miczo, Segrin, and Allspach (2001) examined the relation between social skills and relationship satisfaction among 112 undergraduate students who were in a current romantic relationship. Participants completed questionnaires measuring encoding skills, decoding skills, global self-rating of social skills, and relationship satisfaction. Following the completion of self-report measures, the romantic partner of each participant completed measures of social and communication skills in regards to the participant’s skills (not the romantic partner’s skills) as well as the Relationship Assessment Scale, all of which were returned by mail (i.e., not through the participant). Miczo et al. (2001) found that the romantic partners’ global ratings of the participants’ social skills predicted the partners’ satisfaction. Furthermore, individuals’ ratings of their own social skills were not predictive of their own relationship satisfaction or their partner’s satisfaction. Thus, these findings suggest that, for couples, an individual’s perceptions of his or her partner’s social skills are related to satisfaction in the relationship, but a self-assessment of social skills does not relate to either partner’s satisfaction.

There were several limitations to the Miczo et al. (2001) study that should be mentioned. First, only 70 % of the participants reported that they were in a monogamous
relationship. Relationship satisfaction and processes in communication could be different for the participants who are not monogamous. In addition, the study used a sample of college students who participated for extra credit, and despite this possible motivating factor, a validation procedure of relationship status was not attempted. Therefore, it is possible that some participants completed the study to obtain extra credit despite not meeting criteria of being in a relationship. Finally, although the information was attainable given the study method, the authors did not report discrepancy scores between the individual’s rating of social skills and his or her partner’s rating of social skills. Based on evidence that perceptual accuracy is predictive of relationship satisfaction, obtaining and using discrepancy scores would have provided a more complete picture of the association between social communication skills and relationship satisfaction. Despite the limitations of this study, it does provide information that individuals who perceive their partners as more socially skilled will also rate their own satisfaction with the relationship as higher. Therefore, it is likely that if an individual with ADHD symptoms has difficulties in social communication skills, they may have partners who are less satisfied with the relationship.

Social communication skills appear to be a crucial component in relationship satisfaction. Research has shown that problems in social communication skills are related to less relationship satisfaction. There is also substantial evidence that individuals with ADHD tend to have impaired social communication skills. However, the complex relation between ADHD, social communication skills, and relationship satisfaction has not been examined to date. The current study aimed to fill this gap in the literature.
ADHD and Relationship Satisfaction

Very few studies have been conducted to specifically examine the impact of ADHD on relationship satisfaction among couples where at least one of the partners has ADHD. However, Barkley et al. (2008) reviewed some broader studies of ADHD that examined the occurrence of dissatisfaction in relationships among adults with ADHD. Barkley et al. (2008) concluded that there appears to be inconsistent findings on the topic of relationship satisfaction among individuals with ADHD. Some studies in this review reported higher rates of separation and divorce among adults with ADHD (Biederman et al., 1993), higher risk for marital discord (Murphy & Barkley, 1996), as well as more problems in the areas of marital adjustment and functioning (Minde et al., 2003; Murphy & Barkley, 1996). Likewise, Barkley et al. (2008) reported that, within the University of Massachusetts longitudinal studies, a greater incidence of marital dissatisfaction as well as poorer quality of dating relationships was found in the adults with ADHD particularly for adults who were hyperactive as children as opposed to primarily inattentive.

Although Murphy and Barkley (1996) found higher risk for marital discord and marital adjustment, they did not conclude that rates for divorce or separation were higher among individuals with ADHD. Furthermore, Murphy, Barkley, and Bush (2002) failed to find a significant difference on divorce rates between individuals with ADHD and a community sample. Longitudinal studies following children into young adulthood have not reported differing rates of marriage or divorce among the children growing up with ADHD (Barkley et al., 2008; Weiss & Hechtman, 1993).

Despite the implications for ADHD to negatively relate to relationship satisfaction, the known literature base examining ADHD and relationship satisfaction is
quite limited. Two known studies (Betchen, 2003; Robbins, 2005) focus on describing symptoms of ADHD and how they could create relationship problems, followed by treatment suggestions for couples in which one partner is diagnosed with ADHD. In both studies, the authors suggested treatment options for couples that centered on communication skills improvement, but these articles failed to cite an empirical basis for their conclusions that individuals with ADHD experience communication deficits that interfere with relationship satisfaction.

In another study, Overbey, Snell, and Callis (2011) examined how college students with subclinical symptoms of ADHD, oppositional defiant disorder (ODD), or both cope with stress. They also examined how these subclinical symptoms may be related to relationship satisfaction in intimate relationships. Overbey et al. (2011) gave 497 college students several self-report measures assessing ADHD symptoms and subtypes, Oppositional Defiant Disorder symptoms, recent stressors, coping strategies, and relationship satisfaction. They found that relationship satisfaction was negatively correlated with the inattentive symptoms of ADHD but did not find differences in relationship satisfaction among the different subtypes of ADHD. They concluded that symptoms of ADHD, in general, would be related to less relationship satisfaction.

In summary, there has been a dearth of research examining ADHD and relationship satisfaction. The few studies that have examined this topic did so secondary to a larger project but nonetheless provided evidence of decreased relationship satisfaction among couples with an ADHD diagnosed partner. Although this research provides some support for the hypothesis that ADHD would be associated with decreased relationship satisfaction, it does not answer how or why there would be less satisfaction.
among ADHD status couples. However, it is imperative to answer this question to identify possible points of intervention to accurately and empirically design treatments for distressed couples in which one partner has ADHD.

**Rationale and Hypotheses of Current Study**

Based on research that provides evidence that individuals with ADHD tend to have more difficulty with both receptive and expressive social communication skills as well as the large amount of evidence that communication is a key component to relationship satisfaction, it is reasonable to expect that higher ADHD symptoms in one partner of a romantic dyad would relate to less relationship satisfaction. Furthermore, individuals with ADHD often have a propensity toward demonstrating a PIB compared to actual performance across an array of areas, which likely includes their self-assessment of social communication skills. This associated PIB may create tension between the individual with ADHD symptoms and his or her partner, which may lead to more problems in the relationship due to that individual’s lack of motivation to improve in this area. Although very little research has examined social communication skills and relationship satisfaction among adults with ADHD, several authors (i.e., Betchen, 2003; Halverstadt, 1998; Novotni, 1999; Robbins, 2005) have discussed treatment of social skills and communication problems within adults with ADHD based purely on anecdotal evidence, clinical impressions, or the research investigating ADHD-related social impairments among children. Therefore, it is important to empirically examine the complex interrelations among ADHD symptoms, social communication skills, positive illusory bias, and overall relationship satisfaction among adults—including how deficits
in social communication skills and/or an individual’s positive illusory bias may function as a mediator in the relation between ADHD and dissatisfaction in romantic relationships.

The current study aimed to fill this literature gap by testing the following hypotheses among romantic couples with a range of ADHD symptoms reported. For each hypothesis, the term target refers to the individual within the couple that endorsed the higher number of symptoms on the Barkley Adult ADHD Rating Scale (i.e., so that one individual is identified as the target and the other individual within the couple is identified as the partner). If both individuals in a couple dyad had an equal number of ADHD symptoms, the target was the individual initially recruited to the study.

First, it was hypothesized that targets’ ADHD symptoms would moderate the relation between the targets’ relationship satisfaction and their partners’ relationship satisfaction. Specifically, the relation between the targets’ and partners’ relationship satisfaction would be attenuated when targets endorsed relatively higher levels of ADHD symptoms (Hypothesis 1). Second, it was hypothesized that targets’ ADHD symptoms would be negatively correlated with target and partner relationship satisfaction (Hypothesis 2). Third, it was hypothesized that targets’ ADHD symptoms would be positively correlated with a discrepancy between the targets’ self-ratings and the partners’ ratings of the targets’ social communication skills (i.e., demonstrating a positive illusory bias [PIB] Hypothesis 3). Fourth, it was hypothesized that partners’ ratings of targets’ social communication skills would mediate the relation between targets’ ADHD symptoms and target and partner relationship satisfaction (Hypothesis 4). Specifically, it was predicted that targets’ ADHD symptoms would be negatively related to target and partner relationship satisfaction indirectly through partners’ perceptions of targets’ social
communication skills. Partners’ ratings were used due to the expected PIB by targets with relatively higher levels of ADHD symptoms. Fifth, it was hypothesized that the discrepancy in the couples’ ratings of the targets’ social communication skills would mediate the relation between targets’ ADHD symptoms and target and partner relationship satisfaction (Hypothesis 5). Specifically, it was predicted that targets’ ADHD symptoms would be negatively related to target and partner relationship satisfaction indirectly through a discrepancy in target-partner ratings of targets’ social communication skills (specifically, where targets rated themselves higher than did partners).
CHAPTER II

METHOD

Participants

The current study included 75 couples in a monogamous, heterosexual, romantic relationship for at least one month. Participants were either students recruited through The University of Southern Mississippi’s (USM’s) psychology extra credit pool (SONA) or individuals from the community recruited through social media postings and word-of-mouth, snowball sampling techniques. The initial participants were then asked to provide information for their romantic partner to be contacted. When an individual enrolled they were assigned as the initial “target” until we had the data from both individuals in a couple. After the couples were recruited into the study and both had completed the measures, the individual in the couple dyad with the highest self-reported symptoms of ADHD on the BAARS-IV ADHD Total score was identified as the target and the other individual as the partner. If both individuals in the couple dyad had the same number of symptoms, the individual originally recruited as the target remained as the target and their partner remained as the partner.

Participants had to be at least 18 years of age to participate in the study. The individuals who enrolled in the study ranged in age from 18 to 41 years (target $M = 23.04$, $SD = 5.6$; partner $M = 22.9$, $SD = 4.9$). There were 33 male targets (44%) and 42 female targets (56%). Given that all included couples were heterosexual, this resulted in 42 male partners (56%) and 33 female partners (44%). Of the targets, 48 individuals (64.0%) identified as Caucasian, 26 individuals (34.7%) identified as African American, and one individual (1.3%) identified as an other race. Of the partners, 44 individuals
(58.7%) identified as Caucasian, 28 individuals (37.3%) identified as African American, one individual (1.3%) identified as Asian, and two individuals (2.7%) identified as an other race. The individuals in the study ranged in education level completed from less than sixth grade completed to advanced degrees. Individuals also ranged in income from below 9,000 dollars per year to greater than 100,000 dollars per year.

Participants were asked to participate only if they were in an exclusive relationship. Participants were also included in the study only if they were in a heterosexual relationship. All homosexual couples who enrolled in the study were excluded from the analyses. Of the study sample, 11 couples (14.7%) reported that they were married. Relationship length ranged from the shortest being reported as 3 months and the longest being reported as 22 years ($M = 3.21; SD = 3.71$). Of the targets who completed the study, 11 individuals (14.7%) reported that they had been diagnosed with ADHD. Of the partners, 5 individuals (6.7%) reported that they had been diagnosed with ADHD. More detailed information about participant demographics can be found in Table 1.

Table 1

*Sample Characteristics: Target and Partner Demographics*

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Measures

Demographic and Diagnostic Forms

All targets and partners enrolled in the study completed a demographic and diagnostic form (see Appendix A). Information from all participants was collected about individual mental health history including ADHD diagnostic history. Each individual also provided information on him/herself such as age, gender, race, other diagnoses, age of diagnosis, nature of employment, history of treatment, education history, income, and a few questions about his/her current romantic relationship. Length of relationship, description of first meeting, marital status, living arrangements, and current status of relationship (monogamous) were also asked and for a partner verification procedure. However, as the data were collected, partners were contacted by phone, and any
problematic information for verification led to exclusion of that couple’s information. Likewise, inclusion in the analyses required that the relationship duration for the couple be at least one month.

_Barkley Adult ADHD Rating Scale-IV (BAARS-IV)_

The Barkley Adult ADHD Rating Scale-IV for adults ages 18 to 81 is a 30-item symptom rating scale in which the targets and partners provided a self-report for each item on a 4-point scale, using the response format of 1-*never or rarely*, 2-*sometimes*, 3-*often*, or 4-*very often* (Barkley, 2011). The current symptoms rating scale consists of items directly assessing the DSM-IV criteria for ADHD (APA, 2000) as well as the DSM-5 criteria, given that the symptoms for ADHD did not change in DSM-5 (APA, 2013). In addition to rating symptoms, the participants also answered items about age of onset and the number of settings in which their symptoms may impair functioning (i.e., if symptoms are present). This rating scale was completed by all participants (self-report) for accurate assignment of individuals to the target status.

The majority of the questionnaire items are presented as a symptom list in which respondents rate scores on the list tapping the three major symptom domains of ADHD, including inattention (i.e., “Don’t listen to when spoken to directly”), hyperactivity (i.e., “Shift around excessively or feel restless or hemmed in”), and impulsivity (i.e., “Blurt out answers before questions have been completed, complete others’ sentences, or jump the gun”), as well as a new set of items aimed at measuring a sluggish cognitive tempo (i.e., “I don’t seem to process information as quickly or as accurately as others”). The raw score in each of the first three subscales (inattention, hyperactivity, impulsivity—but not SCT) are summed to create a total score. These first three scales are directly related to
the DSM-IV (as well as DSM-5) symptoms for ADHD (APA, 2000; APA, 2013). The subscales can also be examined and scored to check for subtypes of ADHD (e.g., predominantly inattentive presentation). Any item rated with a 2 or 3 receives 1 point, and the numbers of items with a score of 1 are added for a total subscale (inattention and hyperactivity-impulsivity) score. In the current study, the BAARS-IV was used to measure ADHD symptoms among targets and partners and was used to assign individuals in a couple dyad to be a target or a partner.

In previous research on the BAARS-IV, the correlation between self- and other-ratings for the BAARS-IV Current ADHD total score suggested a very good level of agreement ($r = .70$) between two raters (based on a sample size of 259 participants), providing evidence for inter-rater reliability of the scale (Barkley, 2011). In addition, internal consistency for the scale was found to be excellent ($\alpha = .91$) for the Current ADHD total score, which also has good test-retest reliability ($r = .75$). The construct validity of the BAARS-IV for identifying ADHD symptoms has been supported through research in which individuals with a prior diagnosis of ADHD report a significantly higher number of symptoms on the rating scale. In addition, there has been support showing that BAARS-IV scores are significantly related to difficulties in a wide variety of areas that would be expected to be negatively influenced by ADHD symptoms. These areas include greater impairment in education, occupational functioning, income, marital relationships, driving, smoking, parenting, and various dimensions of psychopathology (Barkley, 2011). In summary, this instrument has been researched extensively, and the results lend strong support for the instrument being a valid and reliable measure of
ADHD. It is also a commonly used measure in the clinical assessment and diagnosis of ADHD in adults.

Alpha coefficients for total score on the BAARS-IV measure were .92 for initial targets (self-report) and .82 for partners (self-report). Thus, results indicated that internal consistency of the BAARS-IV for the current sample ranged from good to excellent.

**Social Skills Inventory (SSI)**

The Social Skills Inventory is a 90-item self-report questionnaire that is designed to measure social communication skills in adults with at least an eighth grade reading level (Riggio, 1989). After the researcher purchased the SSI and obtained permission to utilize this measure online, each target and partner completed the SSI about themselves and about their partner. Participants rated each item on a 5-point scale indicating how much each item applies to the respondent (for the self-report) or the respondent’s partner (for the other-report).

The 90 items are divided into six scales (emotional control, social control, emotional expressivity, social expressivity, emotional sensitivity, and social sensitivity) designed to tap three major areas of social communication, including Expressivity, Sensitivity, and Control (Riggio, 1989). *Emotional Expressivity*, depicted by the item, “I have been told I have expressive eyes,” attempts to capture the skill one has in conveying emotion to others, and *Social Expressivity*, depicted by the item, “I usually take initiative and introduce myself to strangers,” reflects verbal expression and verbal skills in engaging others. The ability to identify the emotions that others are experiencing is captured by the *Emotional Sensitivity* scale and is demonstrated by the item, “People often tell me that I am a sensitive and understanding person.” *Social Sensitivity* is the
ability to accurately understand verbal messages of others and the norms governing appropriate social behavior and is demonstrated by the item, “I often worry that people will misinterpret something I have said to them.” Emotional Control is the ability to self-regulate emotional expressions that include nonverbal displays of expression. An example of this would be the item, “I am able to conceal my true feelings from just about anyone.” Social Control constitutes self-regulation of verbal behavior and self-presentation in social situations. The item, “I can fit in with all types of people, young and old, rich and poor,” is an example (Friedman et al., 2003). Items on the SSI are scored on a 5-point Likert scale, with the scores on six scales ranging from 15 to 75. Scoring is aided with the use of a scoring template, and a Total SSI composite score is provided that is described as a global level of social communication skill or competence.

Riggio (1989) reported internal consistencies for the scales in a range of .62 to .87. Although the majority of the scales seemed adequate, the internal consistency of the emotional expressivity scale (.62) and emotional sensitivity scale (.67) were lacking in strong support. Test-retest reliability scores range from .81 to .96 for the individual scales and .94 for the total SSI composite score. The test-retest reliability was based on a two-week interval with a sample of 40 participants. Evidence of the validity of the measure comes from SSI scores being positively correlated with social behaviors such as dating and job experience. Additionally, there is evidence of convergent validity through positive correlations with the Eysenck Personality Inventory, Personality Research Form, 16-Personality Factor Questionnaire, Profile of Nonverbal Sensitivity, and Affective Communication Tests (Riggio, 1989).
For the current study, partners’ ratings of targets on the Total SSI composite score were used as the primary measure of targets’ social communication skills. Both the targets’ self-ratings and the partners’ ratings of targets on the Total SSI composite score were used to determine the target-partner discrepancy for each couple in examining a PIB. Measures of internal consistency for the Social Skills Inventory total scale were calculated for the target- and partner-ratings of the targets’ social communication skills. Alpha coefficients for the SSI measure were .85 for the targets’ self-report of their own social communication skills and .87 for the partners’ report of the targets’ social communication skills. Thus, results indicated good internal consistency of the SSI for the current sample.

*Couples Satisfaction Index (CSI-32)*

The CSI-32 (Funk & Rogge, 2007) is a recently developed measure of relationship satisfaction. It is a 32-item IRT-derived questionnaire with greater precision and power than earlier measures of couple satisfaction (Funk & Rogge, 2007). The CSI-32 is a well-validated measure with high internal consistency (Cronbach’s alpha = .98). The CSI is appropriate for adults in committed relationships and has demonstrated strong convergent validity with other measures of satisfaction.

For the current study, each target and partner completed the CSI about their own relationship satisfaction. The items are intended to measure satisfaction in general (e.g., “In general, how often do you think things between you and your partner are going well”; “I still feel a strong connection with my partner”). A total score was used for interpretation of relationship satisfaction with higher scores indicating greater
relationship satisfaction. For the current study, the targets’ and partners’ CSI total scores were the primary outcome of interest.

Measures of internal consistency for the CSI total scale score were calculated for both the targets and the partners in the current sample. Alpha coefficients for the CSI measure were .96 for the targets (self-report) and .96 for partners (self-report), indicating excellent internal consistency for the CSI total score for the current sample.

*Relationship Assessment Scale (RAS)*

The Relationship Assessment Scale is a 7-item Likert-scale questionnaire, which assesses global satisfaction with one’s romantic relationship (Hendrick, 1988). The scale was originally constructed for married partners; however, revisions have been provided that make this measure applicable to anyone in an intimate relationship (Vaughn & Baier, 1999). Each target and partner completed the RAS about their own relationship satisfaction. This questionnaire is intended to be a broad measure of relationship satisfaction and, therefore, the items are intended to tap general satisfaction (e.g., “In general, how satisfied are you with your relationship?”; “How many problems are there in your relationship?”). A total score was used for a secondary interpretation of relationship satisfaction with higher scores indicating greater relationship satisfaction (Vaughn & Baier, 1999).

Original research conducted by Hendrick (1981) indicated high internal consistency (.86) and significant correlation coefficients in the moderate to high range between the RAS and the Dyadic Adjustment Scale (DAS) total scores and subscale scores (i.e., ranging from .51 to .83; Hendrick, 1988). More recent research conducted by Vaughn and Baier (1999) found a coefficient alpha of .91 for the RAS, showing excellent
internal consistency. The zero-order correlation between the RAS and the DAS was .84, which was significant and provides evidence for good convergent validity. Overall, there is a large amount of evidence for the reliability and validity of the RAS as a measure of relationship satisfaction for couples in various stages of their relationship.

Measures of internal consistency for the RAS total scale score were calculated for both the targets and the partners in the current sample. Alpha coefficients for the RAS measure were .78 for the targets (self-report) and .87 for partners (self-report), indicating adequate to good internal consistency for the RAS total score for the current sample.

Procedure

Approval from The University of Southern Mississippi Institutional Review Board was obtained prior to the implementation of any study procedures (Appendix B). The primary researcher recruited participants through a variety of sources including SONA (the online listing of experiments in the Department of Psychology at The University of Southern Mississippi), through social media postings, and through word-of-mouth, snowball sampling techniques. Undergraduate participants signed up for the study using SONA and were provided a secure link to the questionnaires (via Qualtrics). After completing the consent, the undergraduate participants were asked to provide contact information for their partner to allow the primary researcher to contact them for both partner verification purposes and to provide the partner with a secure link to the surveys. The undergraduate participants received course credit in exchange for their participation and their partner’s participation in the study.

Community-recruited participants were able to sign up by accessing a link to Qualtrics directly and then asked to provide their partner’s contact information at the end
of the survey. As with the participants recruited through SONA, after the community participants had completed the surveys and provided the researcher with their partner’s email address, the primary researcher emailed the partner with a secure link to the questionnaires (via Qualtrics). Couples recruited from the community through social media were placed in a drawing for a $100 gift certificate for dinner for two at a restaurant or their choosing. One couple was provided the gift certificate to their favorite restaurant after being drawn from the pool of participants. All participants recruited were provided a phone number or email address for the primary investigator in case they had questions or concerns.

A total sample of 231 individuals enrolled in and completed the study. There were a total of 109 students recruited through SONA, and 81 of their partners completed the study. Community recruiting produced 24 initial partners and of those 24 targets, 16 of their partners completed the study. Thus, 133 initial targets participated, but completed data were available for only 97 couples (with 36 partners never completing the study).

Given that students may have been motivated by course credit, partners who were recruited by USM students that signed up for SONA credit were required to provided partner contact information for participation in a verification procedure. The researcher or research assistants contacted the partner by phone if the information provided appeared questionable (for example a target providing their own email as the partner’s contact information). Partners were also required to provide information on how the couple met. If the partner provided an unsatisfactory response to the phone call (when necessary) or had mismatched information with the other individual in the dyad, they were removed from the study.
After calling partners for verification of identity and relationship status, two couples were removed from the study due to falsified data (leaving 95 possible couples). Another three couples were removed because they were homosexual, as the study was limited to heterosexual couples. Therefore, 92 couples remained prior to data validity checks. However, after a systematic review of the data validity questions, 17 additional couples were removed from the sample due to failing to pass the data validity check. Validity checks entailed a look at all participants who failed at least 1 out of 9 validity items inserted unassumingly within the questionnaires (e.g., following a list of item ratings on a scale of never or rarely, sometimes, often, or very often, a data validity check item may state, “For the next item, select sometimes.” After examining the items, a review led to excluding any participants who had more than two out of nine possible errors or participants who missed either one of two specific verification items (i.e., “Please select the color BLUE” and “Choose number ‘3’ for this item”) that were identified as having the majority of the sample answer correctly (even if the participant missed only one of these items and failed no other data validity check items). Following the exclusion of these 17 participants, there were 75 couples remaining in the sample for the analyses of the current study.

Once the participants were recruited for the study, both the targets and the partners completed all of the same questionnaires for the study. After the couples were recruited into the study and completed the measures, the individual in the couple dyad with the highest self-reported symptoms of ADHD on the BAARS-IV ADHD Total score was identified as the target and the other individual as the partner. If both individuals in the couple dyad had the same number of symptoms, the individual originally recruited as
the target remained as the target and their partner remained as the partner. This procedure was done to ensure that the targets in the couple dyads had equal or higher ADHD symptoms when compared to partners and to manipulate the variability and level of ADHD among the targets, given the analyses focused on ADHD symptoms among targets. As a manipulation check, targets and partners were compared on the ADHD Total score via a paired samples $t$-test. Targets had a significantly higher total ADHD symptoms ($M = 31.80, SD = 9.77$) than did partners ($M = 24.05, SD = 4.99$), $t(74) = 7.52$, $p < .001$.

In the current study, all participants were blind to the purpose of the questionnaires, which were presented with no identifying labels. Participants were told that the research involves assessing a variety of communication styles and relationship satisfaction. After consenting to participate through the online consent form, both the targets and partners completed the demographic and diagnostic form, a self-report form of the BAARS-IV, a self- and other-report form of the SSI, a self-report of the CSI-32, and a self-report of the RAS. Participation lasted approximately one hour.
CHAPTER III

RESULTS

Preliminary Analyses

*Creation of the Social Communication Skills PIB Score*

The social communication skills PIB score was calculated by subtracting the partners’ ratings of targets’ social communication skills from the targets own ratings of their social communication skills (i.e., targets’ self-ratings minus partners’ ratings of targets). Thus, a positive score indicated that the targets rated themselves higher than did their partners. As noted in Table 2, the social communication skills PIB score was positive but highly variable across the sample ($M = 4.99, SD = 31.19$). In fact, a difference score of about 5 points is relatively small in magnitude for this scale, which had a potential range from 90 to 450. Although the social communication skills discrepancy (PIB) score was positive, the mean difference between targets’ self-ratings ($M = 276.43, SD = 28.45$) and partners’ ratings of targets’ social communication skills ($M = 271.44, SD = 31.75$) was not significant, $t(74) = 1.39, p = .17$. Thus, there was no evidence that this positive discrepancy score represented a specific bias.

*Descriptive Statistics*

Prior to running the analysis, descriptive statistics were conducted to examine the data and determine if any of the variables exhibited problematic kurtosis or were abnormally skewed (see Table 2). A slight positive skew for ADHD symptoms was found, but no data were removed from the analyses, as these findings are consistent with the occurrence of ADHD in the general population. Likewise, a slight negative skew for target and partner relationship satisfaction on the CSI was found, indicating relatively
happy couples (again, no data were removed). There were no clear outliers found during this process.

Table 2

Descriptives of Variables of Interest ($N = 75$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Range</th>
<th>$M$</th>
<th>$SD$</th>
<th>Potential</th>
<th>Actual</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target ADHD Symptoms</td>
<td></td>
<td>31.80</td>
<td>9.77</td>
<td>18-72</td>
<td>18-72</td>
<td>1.42</td>
<td>3.01</td>
</tr>
<tr>
<td>Target Relationship Satisfaction (CSI)</td>
<td>129.84</td>
<td>23.50</td>
<td>0-161</td>
<td>48-156</td>
<td>-1.17</td>
<td>1.01</td>
<td></td>
</tr>
<tr>
<td>Target Relationship Satisfaction (RAS)</td>
<td>30.23</td>
<td>4.28</td>
<td>7-35</td>
<td>20-35</td>
<td>-.80</td>
<td>-.31</td>
<td></td>
</tr>
<tr>
<td>Partner Relationship Satisfaction (CSI)</td>
<td>126.70</td>
<td>24.96</td>
<td>0-161</td>
<td>37-156</td>
<td>-1.33</td>
<td>1.90</td>
<td></td>
</tr>
<tr>
<td>Partner Relationship Satisfaction (RAS)</td>
<td>29.61</td>
<td>4.51</td>
<td>7-35</td>
<td>17-35</td>
<td>-.89</td>
<td>.31</td>
<td></td>
</tr>
<tr>
<td>Partner-rated Target SCS</td>
<td></td>
<td>271.44</td>
<td>31.75</td>
<td>90-450</td>
<td>204-353</td>
<td>.62</td>
<td>.48</td>
</tr>
<tr>
<td>SCS PIB $^a$</td>
<td></td>
<td>4.99</td>
<td>31.19</td>
<td>-</td>
<td>-66-106</td>
<td>.28</td>
<td>1.06</td>
</tr>
</tbody>
</table>

Note. ADHD = Attention Deficit Hyperactivity Disorder; CSI = Couples Satisfaction Inventory; RAS = Relationship Assessment Scale; SCS = Social Communication Skills; PIB = Positive Illusory Bias.

$^a$ Target’s self-ratings minus partner’s rating of target

*Internal Consistency*

Coefficient alphas were calculated for each total score used in the analyses to determine the internal consistency for the current sample. These can be found reported in the Measures section of this document.
Zero-order Correlations

Zero-order correlation analyses were also conducted between all variables of interest and are reported in Table 3. Although all interrelations are displayed, a few significant correlations are worth mentioning. First, partners’ relationship satisfaction was significantly positively correlated with partners’ ratings of the targets’ social communication skills. Whereas it was predicted that partners’ perceptions of targets’ social communication skills would play a mediational role between targets’ ADHD symptoms and relationship satisfaction, it is interesting to note the direct relation between partners’ perceptions of the targets’ social communication skills and their own relationship satisfaction (at least as measured by the CSI). Additionally, targets’ relationship satisfaction was significantly positively correlated with partners’ relationship satisfaction on both measures providing information for relationship satisfaction. In other words, the more satisfied the targets were with the relationship, the more satisfied the partners were with the relationship. Finally, although partners’ perceptions of the targets’ social communication skills were negatively correlated with the social communication skills PIB, it was part of the calculation of the social communication skills PIB; therefore, such a finding would be expected.

Table 3

*Intercorrelations of Variables of Interest (N = 75)*

<table>
<thead>
<tr>
<th></th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Target ADHD Symptoms</td>
<td>-</td>
<td>-.12</td>
<td>-.09</td>
<td>-.18</td>
<td>-.17</td>
<td>.04</td>
<td>.14</td>
</tr>
<tr>
<td>2. Target Relationship Satisfaction (CSI)</td>
<td>--</td>
<td>-</td>
<td>.81***</td>
<td>.64***</td>
<td>.70***</td>
<td>.06</td>
<td>.13</td>
</tr>
</tbody>
</table>
### Table 3 (continued)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>3. Target Relationship Satisfaction (RAS)</th>
<th></th>
<th>4. Partner Relationship Satisfaction (CSI)</th>
<th></th>
<th>5. Partner Relationship Satisfaction (RAS)</th>
<th></th>
<th>6. Partner-rated Target SCS</th>
<th></th>
<th>7. SCS PIB $^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>---</td>
<td>.59***</td>
<td>.70***</td>
<td>.05</td>
<td>.11</td>
<td>---</td>
<td>.91***</td>
<td>.26*</td>
<td>-.09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>---</td>
<td></td>
<td>---</td>
<td>.17</td>
<td>-.01</td>
<td></td>
<td>---</td>
<td></td>
<td>.59***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td>---</td>
</tr>
</tbody>
</table>

Note. ADHD = Attention Deficit Hyperactivity Disorder; CSI = Couples Satisfaction Inventory; RAS = Relationship Assessment Scale; SCS = Social Communication Skills; PIB = Positive Illusory Bias.

$^a$ Target’s self-ratings minus partner’s rating of target

$*** p < .001. ** p < .01. * p < .05.$

**Covariates**

Covariates were determined prior to analysis of each hypothesis using zero-order correlations between possible control variables (e.g., demographic variables) and the outcome variables (i.e., target relationship satisfaction, partner relationship satisfaction), the variables that served as mediators and, therefore, were outcome variables in part of the mediation analysis (i.e., partner-rated target social communication skills and the social communication skills PIB), and target ADHD symptoms (to use control variables relating to this predictor variable when it was examined through partial correlations). Results of these zero-order correlations are displayed in Table 4.
Table 4

*Intercorrelations of Possible Covariates with Outcome Variables (N = 75)*

<table>
<thead>
<tr>
<th></th>
<th>Target ADHD Symptoms</th>
<th>Target Relationship Satisfaction (CSI)</th>
<th>Target Relationship Satisfaction (RAS)</th>
<th>Partner Relationship Satisfaction (CSI)</th>
<th>Partner Relationship Satisfaction (RAS)</th>
<th>Partner-rated Target Social Communication Skills</th>
<th>SCS PIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Age</td>
<td>-.04</td>
<td>.13</td>
<td>.26*</td>
<td>.09</td>
<td>.19†</td>
<td>.02</td>
<td>.01</td>
</tr>
<tr>
<td>Partner Age</td>
<td>.09</td>
<td>.07</td>
<td>.20†</td>
<td>-.02</td>
<td>.10</td>
<td>-.04</td>
<td>.03</td>
</tr>
<tr>
<td>Target Gender</td>
<td>.09</td>
<td>-.17</td>
<td>-.14</td>
<td>-.09</td>
<td>-.11</td>
<td>.01</td>
<td>-.08</td>
</tr>
<tr>
<td>Partner Gender</td>
<td>-.09</td>
<td>.17</td>
<td>.14</td>
<td>.09</td>
<td>.11</td>
<td>-.01</td>
<td>.08</td>
</tr>
<tr>
<td>Target Race (Dich.)</td>
<td>-.23†</td>
<td>-.32**</td>
<td>-.47***</td>
<td>-.22†</td>
<td>-.31**</td>
<td>-.20†</td>
<td>.03</td>
</tr>
<tr>
<td>Partner Race (Dich.)</td>
<td>-.17</td>
<td>-.30**</td>
<td>-.44***</td>
<td>-.15</td>
<td>-.22†</td>
<td>-.14</td>
<td>.07</td>
</tr>
<tr>
<td>Target Income</td>
<td>.12</td>
<td>.14</td>
<td>.24*</td>
<td>.12</td>
<td>.20†</td>
<td>-.10</td>
<td>.38**</td>
</tr>
<tr>
<td>Partner Income</td>
<td>.23*</td>
<td>.12</td>
<td>.18</td>
<td>.06</td>
<td>.05</td>
<td>.13</td>
<td>-.05</td>
</tr>
<tr>
<td>Relationship Length</td>
<td>-.01</td>
<td>.04</td>
<td>.11</td>
<td>-.05</td>
<td>.04</td>
<td>-.01</td>
<td>-.10</td>
</tr>
</tbody>
</table>

Note. Dich. = Dichotomous variable; ADHD = Attention Deficit Hyperactivity Disorder; Sat. = Satisfaction; CSI = Couples Satisfaction Inventory; RAS = Relationship Assessment Scale; SCS = Social Communication Skills; PIB = Positive Illusory Bias (as measured by target’s self-ratings minus partner’s ratings of target). Target and partner gender were coded for the analyses with 0 = male and 1 = female; target and partner race were recoded for the analyses with 0 = Caucasian and 1 = African American/Other.

*a* Target’s self-ratings minus partner’s rating of target.
Note that variables included in the correlations were continuous variables or dichotomized categorical variables. Specifically, target race and target gender were recoded as 0 = Caucasian and 1 = African American/Other for the purposes of these analyses. This recoded, dichotomized variable was used whenever race was a control variable in subsequent analyses.

Control variables were any demographic variable significantly relating to an examined variable ($p < .05$)—or any marginally significant variable relating to an examined variable ($p < .10$) if the magnitude of the correlation coefficient was $r = .20$ or higher (i.e., to be most conservative in the analyses). There were a few exceptions. Specifically, if target age and partner age were both indicated as controls for a specific variable, only target age was used because target and partner age were significantly correlated $r = .77, p < .001$. As such, target and partner age had 59% shared variance. Likewise, if target race and partner race were both indicated as controls for a specific variable, only target race was used. As such, target and partner race had 71% shared variance. If both target age and partner age were indicated, only target age was used because target and partner age were significantly correlated $r = .84, p < .001$. However, if target income and partner income were both indicated as controls for a specific variable, both were used because these two variables were only correlated, $r = .38, p = .001$, thus having only 14% shared variance. Therefore, controlling for both of these variables separately appeared indicated.

No other target-partner demographics (e.g., gender) significantly related to specific variables of interest. Thus, control variables utilized in subsequent analyses depend on the scale being used as an outcome measure. Each time targets’ relationship satisfaction was examined as an outcome using the CSI, target gender, target race, an
target income were used as control variables. When targets’ relationship satisfaction was examined as an outcome using the RAS, target age, target race, target income, and partner income were used as control variables. When partners’ relationship satisfaction was examined as an outcome using the CSI, target race was used as a control variable. When partners’ relationship satisfaction was examined as an outcome using the RAS, target age, target race, and target income were control variables. When the social communication skills PIB was included as a mediator, target income was included as a control variable (if not already controlled based on the outcome variable). Finally, for the hypotheses examined with correlation analyses only (where the relation is bivariate and there is no clear predictor/outcome variable), target race and target income (both of which related to targets’ ADHD symptoms) were used as controls if not already included based on the other variable in the analysis. All analyses were run both with controls and without controls to examine any differences based on the covariates included.

Analyses to Test Hypotheses

Hypothesis 1 (that targets’ ADHD symptoms would moderate the relation between the targets’ relationship satisfaction and their partners’ relationship satisfaction) was tested using moderated regression analyses through SPSS using the PROCESS tool (Hayes, 2013). Each analysis was conducted twice—one to examine relationship satisfaction with the CSI (Table 5) and once to examine relationship satisfaction with the RAS (Table 6). For each analysis, targets’ ADHD symptoms and targets’ relationship satisfaction were centered by subtracting the sample mean. Then, an interaction term was created by multiplying targets’ ADHD symptoms (centered) with targets’ relationship satisfaction (centered)
Table 5

Results of Moderated Multiple Regression Analysis of ADHD Symptoms

Moderating the Relations between the Targets’ Ratings of Relationship Satisfaction (CSI) and their Partners’ Ratings of Relationship Satisfaction (CSI; Hypothesis 1)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Model 1 (Controls)</th>
<th>Model 2 (Main Effects)</th>
<th>Model 3 (2-way Interaction)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Gender</td>
<td>-3.74</td>
<td>1.17</td>
<td>1.18</td>
</tr>
<tr>
<td>Target Race (Dich.)</td>
<td>-9.78</td>
<td>-2.04</td>
<td>-2.01</td>
</tr>
<tr>
<td>Target Income</td>
<td>.57</td>
<td>.34</td>
<td>.35</td>
</tr>
<tr>
<td>Target Relationship Satisfaction (CSI)</td>
<td>-</td>
<td>.65***</td>
<td>.66</td>
</tr>
<tr>
<td>Target ADHD Symptoms</td>
<td>-</td>
<td>-.31</td>
<td>-.25</td>
</tr>
<tr>
<td>Target ADHD x RS</td>
<td>-</td>
<td>-</td>
<td>-.0004</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.06</td>
<td>.42***</td>
<td>.42***</td>
</tr>
<tr>
<td>$R^2\Delta$</td>
<td>.06</td>
<td>.36***</td>
<td>.00</td>
</tr>
</tbody>
</table>

Note. Unstandardized regression coefficients are reported. Outcome variable is partner relationship satisfaction (CSI). Dich. = Dichotomous variable; CSI = Couples Satisfaction Inventory; ADHD = Attention Deficit Hyperactivity Disorder; RS = Relationship Satisfaction. Target gender was coded for the analyses with 0 = male and 1 = female; target race was recoded for the analyses with 0 = Caucasian and 1 = African American/Other.

***$p < .001.$

Table 6

Results of Moderated Multiple Regression Analysis of ADHD Symptoms Moderating the Relations between the Targets’ Ratings of Relationship Satisfaction (RAS) and their Partners’ Ratings of Relationship Satisfaction (RAS; Hypothesis 1)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Gender</td>
<td>-.67</td>
<td>-.01</td>
<td>.01</td>
</tr>
<tr>
<td>Target Race (Dich.)</td>
<td>-2.81*</td>
<td>-.14</td>
<td>-.14</td>
</tr>
</tbody>
</table>
Table 6 (continued).

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Partner Income</td>
<td>-.23</td>
<td>-.16</td>
<td>-.16</td>
</tr>
<tr>
<td>Target Relationship</td>
<td>-</td>
<td>.72***</td>
<td>.79*</td>
</tr>
<tr>
<td>Satisfaction (RAS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target ADHD Symptoms</td>
<td>-</td>
<td>-.04</td>
<td>.03</td>
</tr>
<tr>
<td>Target ADHD x RS</td>
<td>-</td>
<td>-</td>
<td>-.002</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.12†</td>
<td>.51***</td>
<td>.51***</td>
</tr>
<tr>
<td>$R^2\Delta$</td>
<td>.12†</td>
<td>.39***</td>
<td>.0003</td>
</tr>
</tbody>
</table>

Note. Unstandardized regression coefficients are reported. Outcome variable is partner relationship satisfaction (RAS).

Dich. = Dichotomous variable; RAS = Relationship Assessment Scale; ADHD = Attention Deficit Hyperactivity Disorder; RS = Relationship Satisfaction. Target gender was coded for the analyses with 0 = male and 1 = female; target race was recoded for the analyses with 0 = Caucasian and 1 = Other.

*** p < .001. * p < .05. † trend; p < .10.

Regression analyses were conducted placing the proper control variables by scale (target race, target income, and target gender for the analysis with the CSI; target race, target age, target gender, target income, and partner income for the analysis with the RAS) on the first step, the main effects (targets’ ADHD symptoms and targets’ relationship satisfaction) on the second step, and the interaction term (targets’ ADHD symptoms X targets’ relationship satisfaction) on the third step. The outcome variable was the partners’ relationship satisfaction (either CSI or RAS). The interaction was not significant (for either the CSI or the RAS); therefore, Hypothesis 1 was not supported. To fully explore this hypothesis, these analyses were also conducted with no control variables, and still no significant interactions emerged.
Hypothesis 2 (that targets’ ADHD symptoms would be negatively correlated with target and partner relationship satisfaction) was examined using partial correlation analyses. Control variables were entered for significant covariates identified in Table 4 for each variable in the analysis (targets’ ADHD symptoms and specific relationship satisfaction variable). Targets’ ADHD symptoms were significantly negatively correlated with partner relationship satisfaction on the CSI (controlling for target race and target income) and trending toward a significant correlation with partner relationship satisfaction on the RAS (controlling for target gender, target race, target income, and partner income; Table 7). Targets’ own relationship satisfaction was negatively, but not significantly, correlated with their ADHD symptoms (Table 7). Therefore, some support was found for Hypothesis 2, in that partners’ relationship satisfaction was found to be significantly negatively correlated with targets’ ADHD symptoms, but targets’ relationship satisfaction was not significantly related to their own ADHD symptoms. Notably, however, the zero-order correlations between targets’ ADHD symptoms and relationship satisfaction—target or partner, CSI or RAS—were not significant (Table 3), indicating that the relations were suppressed when considering the variance accounted for by the covariates.

Hypothesis 3 (that targets’ ADHD symptoms would be positively correlated with a discrepancy between the targets’ self-ratings and the partners’ ratings of the targets’ social communication skills) was examined using a partial correlation analysis to include control variables (target race and target income). Targets’ ADHD symptoms were positively but not significantly correlated with the social communication skills PIB ($r = .15, p = .20$; see Table 7). Control variables (target race and target income) were included
in the partial correlation analysis. The relation was also non-significant at the zero-order level (Table 3). Thus, in all, Hypothesis 3 was not supported.

Table 7

**Partial Correlation Analyses (Hypothesis 2 and 3)**

<table>
<thead>
<tr>
<th></th>
<th>ADHD Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Relationship Satisfaction (CSI)⁴</td>
<td>-.19</td>
</tr>
<tr>
<td>Target Relationship Satisfaction (RAS)⁵</td>
<td>-.22†</td>
</tr>
<tr>
<td>Partner Relationship Satisfaction (CSI)⁶</td>
<td>-.24*</td>
</tr>
<tr>
<td>Partner Relationship Satisfaction (RAS)⁷</td>
<td>-.25*</td>
</tr>
<tr>
<td>SCS PIB ⁸,⁹</td>
<td>.15</td>
</tr>
</tbody>
</table>

Note. ADHD = Attention Deficit Hyperactivity Disorder; CSI = Couples Satisfaction Inventory; RAS = Relationship Assessment Scale; SCS = Social Communication Skills; PIB = Positive Illusory Bias.

⁴ Controlling for target gender, target race, and target income.
⁵ Controlling for target gender, target race, target income, and partner income.
⁶ Controlling for target race and target income.
⁷ Controlling for target age, target race, and target income.
⁸ Target’s self-ratings minus partner’s rating of target
⁹ *p < .05. † trend; p < .10

Hypothesis 4 (that partners’ ratings of targets’ social communication skills would mediate the relation between targets’ ADHD symptoms and target and partner relationship satisfaction) was examined using mediational analyses to test for an indirect effect through partners’ perceptions of targets’ social communication skills. Analyses were conducted using PROCESS for SPSS (Hayes, 2013) and the product of coefficients method. Unstandardized regression coefficients were examined for the potential indirect effect of partners’ ratings of targets’ social communication skills, linking ADHD
symptoms and target and partner relationship satisfaction. Both the CSI and RAS were examined, resulting in four mediational analyses for this hypothesis. Bootstrap analyses with 5,000 resamples with replacement were used to make adjustments for asymmetrical confidence limits (Hayes, 2013). Confidence intervals exclusive of zero would indicate a significant indirect effect. For each analysis conducted, the necessary control variables were utilized depending on the mediator and the outcome measure and what was indicated by prior analyses (see earlier description of controls by measure). The analyses revealed that none of the tested models yielded significant indirect effects (Figure 1); thus, Hypothesis 4 was not supported. To fully explore this hypothesis, these analyses were also conducted with no control variables, and still no significant indirect effect emerged.

Hypothesis 5 (that the discrepancy in the couples’ ratings of the targets’ social communication skills would mediate the relation between targets’ ADHD symptoms and target and partner relationship satisfaction) was examined using the same regression analysis approach as described for Hypothesis 4. Again, analyses were conducted using PROCESS for SPSS (Hayes, 2013) and the product of coefficients method. Unstandardized regression coefficients were examined for the potential indirect effect of discrepancy in social communication skills (PIB), linking ADHD symptoms and target and partner relationship satisfaction. Bootstrap analyses with 5,000 resamples with replacement were used to make adjustments for asymmetrical confidence limits (Hayes, 2013). Confidence intervals exclusive of zero would indicate a significant indirect effect.
Figure 1. Mediated outcomes on targets’ relationship satisfaction (panels A and B) and partners’ relationship satisfaction (panels C and D) showing indirect effects of targets’ ADHD symptoms through partners’ perceptions of targets’ social communication skills (Hypothesis 4). Unstandardized regression coefficients are reported. The statistics in brackets shows the total effect of the predictor on the outcome; the statistic in parentheses shows the direct effect of the predictor on the outcome, after controlling for the indirect effect of the mediator. Each indirect effect (depicted above each curved, dashed arrow) was not significant based on an asymmetric 95% confidence interval with 5,000 resamples with replacement (Hayes, 2013). Panel A is controlling for target race, target gender, and target income. Panel B is controlling for target age, race, target income, and partner income. Panel C is controlling for target race. Panel D is controlling for target age, race, and income. ADHD = Attention Deficit Hyperactivity Disorder; CSI = Couples Satisfaction Inventory; RAS = Relationship Assessment Scale; SCS = Social Communication Skills.
Figure 2. Mediated outcomes on targets’ relationship satisfaction (panels A and B) and partners’ relationship satisfaction (panels C and D) showing indirect effects of targets’ ADHD symptoms through discrepancy in ratings of targets’ social communication skills (Hypothesis 5). Unstandardized regression coefficients are reported. The statistics in brackets show the total effect of the predictor on the outcome; the statistics in parentheses shows the direct effect of the predictor on the outcome, after controlling for the indirect effect of the mediator. Each indirect effect (depicted above each curved, dashed arrow) was not significant based on an asymmetric 95\% confidence interval with 5,000 resamples with replacement (Hayes, 2013). Panel A is controlling for target race, target gender, and target income. Panel B is controlling for target age, target race, target income, and partner income. Panel C is controlling for target race. Panel D is controlling for target age, race, and income. ADHD = Attention Deficit Hyperactivity Disorder; CSI = Couples Satisfaction Inventory; RAS = Relationship Assessment Scale; SCS = Social Communication Skills; PIB = Positive Illusory Bias.
For each analysis conducted, the necessary control variables were utilized depending on the mediator and the outcome measure used and what was indicated by prior analyses (see earlier description of controls by measure). The analyses revealed that none of the tested models yielded significant indirect effects (Figure 2); thus, Hypothesis 5 was not supported. To fully explore this hypothesis, these analyses also were conducted with no control variables, and still no significant indirect effect emerged.

Post-hoc Analyses

It should be noted that all analyses to test Hypotheses 1 through 5 were conducted using the targets’ inattention score and the targets’ hyperactivity-impulsivity score from the BAARS-IV (each examined separately). These post-hoc exploratory analyses were conducted both with and without relevant control variables. The pattern of findings was the same as that found for the ADHD total symptom score. There was no support for these symptom subtypes moderating the relation between targets’ and partners’ relationship satisfaction, there was no support for these symptom subtypes relating to a PIB in targets’ social communication skills, and there was no support for these symptom subtypes relating to relationship satisfaction indirectly through either partner’s ratings of targets’ social communication skills or a discrepancy between targets’ and partners’ ratings of targets’ social communication skills. The only findings were marginally significant or significant partial correlations between the targets’ symptom subtypes (inattention and hyperactivity-impulsivity) and relationship satisfaction. The difference between these findings and those examining total ADHD symptoms is that both subtypes—when considered separately—related to target relationship satisfaction, as well as partner relationship satisfaction across both measures (CSI and RAS). Partial
correlation coefficients with relationship satisfaction variables ranged from -.22 to -.27 for the inattention symptoms and from -.20 to -.24 for the hyperactivity-impulsivity symptoms (i.e., largely the same pattern for the two subtypes).
CHAPTER IV
DISCUSSION

The current study examined the possible relations between ADHD symptoms, social communication skills, and relationship satisfaction among couples. Furthermore, the current study examined whether partners’ ratings of targets’ social communication skills (as well as a discrepancy between partners’ ratings and targets’ rating of targets’ own social communication skills) could mediate the relation between targets’ ADHD symptoms and relationship satisfaction among couples.

Hypothesis 1 was not supported in that ADHD symptoms did not moderate the relation between the targets’ ratings of relationship satisfaction and their partners’ ratings of relationship satisfaction. In general, the relationship satisfaction among individuals in a couple dyad were positively related across different measures of relationship satisfaction, and these interrelations were not attenuated by the targets’ ADHD symptoms as initially predicted.

There was some partial support for Hypothesis 2. Targets’ ADHD symptoms were negatively correlated with partner relationship satisfaction but not target relationship satisfaction. Furthermore, when the relevant control variables were removed, the finding was no longer present, suggesting that the relation is suppressed when considering the variance accounted for by the covariates.

Hypothesis 3 was not supported. Targets’ ADHD symptoms were not positively correlated with a discrepancy between the targets’ self-ratings and the partners’ ratings of the targets’ social communication skills. Finally, Hypotheses 4 and 5 were also unsupported. Partners’ ratings of targets’ social communication skills did not mediate the
relation between targets’ ADHD symptoms and target and partner relationship satisfaction. Furthermore, the discrepancy in the couples’ ratings of the targets’ social communication skills did not mediate the relation between targets’ ADHD symptoms and target and partner relationship satisfaction.

Link to Previous Literature

Although the results of the current study were mostly unsupportive of the hypotheses, aspects of the current findings are supportive of some of the literature on ADHD and relationship satisfaction in couples. Although target relationship satisfaction was not found to be negatively correlated with ADHD symptoms, the partners’ reports of relationship satisfaction were negatively related. When reviewing the literature, some possible explanations for the current findings would be that examining subtype may be a more meaningful examination of the particular ADHD deficits and how they relate to relationships. The post-hoc analyses did reveal relations with target relationship satisfaction that were not found when considering total ADHD symptoms, suggesting a nuanced examination could be beneficial. Other literature has revealed some exploration of subtypes of ADHD in relation to romantic satisfaction. However, the literature appears to have mixed findings in regard to subtype. There are some studies that have reported negative consequences specifically for the inattentive type. For example, Canu and Carlson (2007) studied ADHD social romantic impressions through in vivo interactions of opposite sex individuals where one was either diagnosed with ADHD-combined type or ADHD-inattentive type. They found that the individuals diagnosed with ADHD-inattentive type were perceived as less romantically desirable than the ADHD-combined type. Additionally, Robin and Payson (2002) reported that strong dissatisfaction among
couples with an identified ADHD partner are often more associated with inattentive behaviors than hyperactive behaviors.

Additionally, a recent study examined real time conflict management (negative behaviors vs. positive behaviors) in couples with and without a partner diagnosed with ADHD to examine both conflict style and relationship satisfaction (Canu, Tabor, Michael, Bazzini, & Elmore, 2013). They found that ADHD couples, regardless of type (combined vs. inattentive), had less relationship satisfaction compared to non-ADHD diagnosed couples. However, they found that having ADHD-combined type was more predictive of couples’ dissatisfaction than ADHD-inattentive type. Given the growing evidence that ADHD does appear to impact relationship satisfaction, it becomes necessary to look at reasons the current study may not have replicated the findings that recent research seems to support.

In this study, it was hypothesized that because individuals with ADHD have been shown to demonstrate a positive illusory bias in a variety of settings, they may also display a PIB in ratings of their own social communication skills. Among the current sample the differences between the targets’ ratings of social communication skills and the partners’ ratings of social communication skills did not predict relationship satisfaction. However, the partners’ ratings of targets’ social communication skills were significantly correlated with partner’s relationship satisfaction on the CSI. Another seemingly logical finding was that a partner’s relationship satisfaction was significantly correlated with targets’ relationship satisfaction. Although it was expected, based on research findings, that perceptual accuracy (agreement among individuals in a couple dyad when rating a trait) would be associated with relationship satisfaction (Decuyper et al., 2012; Letzring
& Noftle, 2010), there is another major theory within the couples PIB literature that may shed some light on our current findings.

Specifically, within the literature examining perception of partners on relationship satisfaction, another major competing theory outside of the perceptual accuracy theory is the Positive Illusions Theory. The Positive Illusions Theory, proposed by Murray, Holmes, and Griffin (1996) proposes that people are more satisfied/happier in their relationships when they view their partner more positively than the partner views himself or herself. Consistent with this theory, researchers also found that romantic relationships in which there was more idealization also predicted longer relationships (Murray & Holmes, 1997). The Positive Illusions Theory has been replicated in homosexual couples (Conley, Roesch, Peplau, & Gold, 2009) and cross-culturally (Endo, Heine, & Lehman, 2000; Tomaya, 2002).

The current sample had primarily very happy couples (CSI Target $M = 129.84$; CSI Partner $M = 126.7$) who scored, on average, above “very satisfied” couples (defined by a score of 121; CSI-32; Funk & Rogge, 2007) as well as who demonstrated a negative skew for both target and partner relationship satisfaction (i.e., many more targets and partners endorsing higher relationship satisfaction than lower relationship satisfaction). Therefore, it may be that the partners saw the targets in a positive light and, therefore, associations with relationship satisfaction did not appear even if the targets did demonstrate a PIB concerning their own social communication skills. In other words, if the partners in this sample exhibited a relationally positive bias about the targets, it would have closed the gap in the differences reported between partners and targets report of social communication skills of the targets. Perhaps a more relationally distressed sample
would have resulted in larger differences in social communication skills ratings among
couple dyads and a relation with relationship satisfaction may have emerged.

Limitations and Directions for Future Research

There were several limitations that should be addressed when considering the
results of the current study. The first limitation to consider is the homogeneity of the
sample. The sample consisted mostly of college students, and the ages ranged from 18 to
41 with a mean age of 23 years. The majority of the sample was Caucasian and only 11
of the couples had committed to marriage. Fifty-nine out of the 75 couples that enrolled
in the study were college students, which may speak to the level of commitment and
experience they have with relationships and evaluation of satisfaction in those
relationships. Nevertheless, even with the low level of variability among the
demographic factors, race was negatively related to relationship satisfaction and income
was positively related to relationship satisfaction. A more heterogeneous sample may
have produced a broader range of outcomes; however, given the restricted sample, the
results of the current study may not generalize to the broader population.

Second, whereas it is important to assess ADHD symptoms on a continuum and
for impact along the range of severity, the current sample produced a limited number of
targets (11) who identified as having been previously diagnosed with ADHD, as well as a
positive skew for targets’ ADHD symptoms (i.e., many more targets endorsing lower
levels of symptoms than higher levels of symptoms of ADHD). This limited sample may
not have produced the range and power needed to detect relational differences in couples’
satisfaction along the continuum of ADHD symptoms. It would be important for future
research to include more individuals on the higher end of the ADHD continuum as well
as to examine these research questions among a clinical sample of individuals with ADHD who are in romantic relationships.

Furthermore, as mentioned earlier, on average the sample was an extremely relationally satisfied group. It may be that individuals who are happier in their relationships are more willing to participate in a study for their partner (extra credit/or just asking) that took considerable time for little to no compensation. This sampling process may have contributed to producing a sample of unusually satisfied partners who view their partners in a particularly positive “partner glow.”

Whereas there are many benefits to online data collection, there are also limitations that should be considered. Using this method meant that the conditions under which the questionnaires were completed could not be controlled by the experimenter. Even though instructions were provided and participants were asked to complete their questionnaires in privacy (provided individual secure links), there is no way of knowing how distracted or pressured an individual may have been. In an ideal word, participants would have come into a lab and been administered the questionnaires to ensure consistency across administration. Unfortunately, this control is lost with the introduction of online collection.

Additionally, the validity of instruments used to measure the constructs of interest should be considered. It is possible that the measures chosen for the current study did not measure adult ADHD symptoms, relationship satisfaction, and/or social communication skills as intended. Future research replicating the current methodology with different measurement instruments may yield different results.
Moreover, multiple research groups (e.g., Canu & Carlson, 2007; Overby et al., 2011; Ward, 2008) have proposed that a vast array of variables (attachment style; comorbid diagnoses; ADHD subtype) are likely involved in predicting outcomes in relationship satisfaction among adults with ADHD. Thus, the null findings in the current study could be explained by factors that remain unmeasured in the current study. In the future, researchers should continue to expand to new methods of assessment, populations, and variables associated with social functioning in ADHD to more fully capture individual and couple functioning.

Conclusions

Despite the general lack of support for the tested hypotheses, a number of noteworthy conclusions can be drawn from the results. First, there is evidence that ADHD symptoms negatively relate to partners’ relationship satisfaction and may relate to relationship satisfaction in both individuals in a couple when considered at the subtype level. Second, although a positive illusory bias was not found, a new consideration of the implications for looking at PIB in individuals with ADHD within a couples’ perspective context was discovered and will inform this researcher’s future directions of study in this area. In the future, more innovative ways of assessing PIB within the couple context must be designed. It may involve more raters of the individual with ADHD—or ADHD symptoms—than just their romantic partner. Lastly, the results of the current study are consistent with the mixed findings of the existing literature base. Thus, continued research aimed at identifying possible moderating and mediating factors of relationship satisfaction among individuals with ADHD remains critical for the formation of future clinical applications.
APPENDIX A

MEASURES USED IN THE CURRENT STUDY

Demographic and Diagnostic Form

DEMOGRAPHIC QUESTIONNAIRE
These forms are for providing some basic information about yourself and your background. Please fill out the following information about yourself as accurately as you can.

Age: _______ Date of Birth: (Month/Day/Year) _____/____/____

Gender: Female ___ Male ___ Partner’s First and Last Initials: ______

Partner's age: _____ Partner's Date of Birth: (Month/Day/Year) ____/____/____
Race: White ___ Black ___ Hispanic ___ Asian ___ Other _____________

Your Partner's Race: White ___ Black ___ Hispanic ___ Asian ___ Other ___

Marital Status: Single ___ Married ___ Widowed ___ Divorced ___ Committed Relationship/Not Living with Partner ___ Committed Relationship/Living with Partner

Length of Current Relationship: ________________________________

In what month did you meet your current partner? ____________________

Have there been any significant changes in your life, major life events, in the past two years? (Examples include a birth/death in the family, moving, parental loss of job, parental separation, medical illness in the family, etc.) Please list any/all major life events that have occurred in the past two years.
________________________________________________________________________
________________________________________________________________________
On a scale of 1 to 5 please rate how much you have been affected by these major life events, with 1 being not at all or very little and 5 being significantly affected. __________

Location: (City, State) _____________________, ________________

Education: What is the highest level of education completed by:
Yourself

_____ 6th grade or less
_____ Junior high school (7th, 8th, 9th grade)
_____ Some high school (10th, 11th grade)
_____ High school graduate
_____ Some college (at least 1 year) or specialized training
_____ College/university graduate (4-year degree)
_____ Graduate professional degree (Master’s, Doctorate)

Your Spouse/Significant Other

_____ 6th grade or less
_____ Junior high school (7th, 8th, 9th grade)
_____ Some high school (10th, 11th grade)
_____ High school graduate
_____ Some college (at least 1 year) or specialized training
_____ College/university graduate (4-year degree)
_____ Graduate professional degree (Master’s, Doctorate)

Occupation: Please provide your job title or position, NOT the just name of your employer. For example, if you are a teacher at Lee High School, please state “high school teacher”. If you are retired, please state your prior occupation. If you do not work outside the home, state “unemployed.”

What is your occupation? __________________________________________________ (Please be specific)

What is your spouse/significant other’s occupation? __________________________________________________________________________ (Please be specific)

Income: What is the total annual income of your household? (Combine the income of all people living in your house or if you are a student who is dependent on parents use parents’ income.)

_____ $ 0 -- $ 4,999 _____ $15,000 -- $24,999 _____ $50,000 -- $74,999
_____ $ 5,000 -- $ 9,999 _____ $25,000 -- $34,999 _____ $75,000 -- $99,999
_____ $10,000 -- $14,999 _____ $35,000 -- $49,999 _____ $100,000 and above

How many total people live in your household?

___1 ___2 ___3 ___4 ___5 ___6 ___7 ___8 ___9 ___10 ___>10

Please use the following scale to respond to question 6:

1 = Very Satisfied
2 = Somewhat Satisfied
3 = Somewhat Dissatisfied
4 = Very Dissatisfied

How satisfied are you with: (Circle a response)

Your present marriage (or intimate relationship)..................1 2 3 4
Relationships with family members (parents, siblings):........1 2 3 4
Friendships:.................................................................1 2 3 4
Kind of work you do:.....................................................1 2 3 4
The place where you work:..............................................1 2 3 4
Future work opportunities:.............................................1 2 3 4

Diagnostic Questions

Have you ever received any psychological diagnoses? (Please select all diagnoses received)

___ADHD ___Anxiety Disorder ___Bipolar Disorder ___Conduct Disorder
___Depression ___Learning Disability ___Schizophrenia ___Mental Retardation
___Oppositional Defiant Disorder ___Other _________________________________________

If yes to any of the above:
What age were you when you first noticed symptoms? ________
How old were you when you were diagnosed? __________
Who diagnosed you? Psychologist ____ Physician_____ Neurologist____
Psychiatrist____ Other (Please specify) _________________

If yes to any of the above:
How old were you when you were diagnosed? __________
Who diagnosed you? Psychologist ____ Physician_____ Neurologist____
Psychiatrist____ Other (Please specify) _________________

Do you use alcohol or illegal substances? ________
If yes, what do you use?___________________________________________________
If yes, how often do you use substances?______________________________________

Have you ever been diagnosed with a substance use disorder?___________________
Have you ever completed treatment for a substance use disorder?________________

Please include any other important information about your mental health that may not have been covered in the questions above:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
APPENDIX B

INSTITUTIONAL REVIEW BOARD
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Phone: 601.266.5997 | Fax: 601.266.4377 | www.usm.edu/research/institutional-review-board

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the “Adverse Effect Report Form”.
- If approved, the maximum period of approval is limited to twelve months.
  Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 14031011
PROJECT TITLE: Do Social Communication Skills Mediate the Relation between ADHD and Relationship Satisfaction?
PROJECT TYPE: New Project
RESEARCHER(S): Erin Bell
COLLEGE/DIVISION: College of Education and Psychology
DEPARTMENT: Psychology
FUNDING AGENCY/SPONSOR: N/A
IRB COMMITTEE ACTION: Expedited Review Approval
PERIOD OF APPROVAL: 03/25/2014 to 03/24/2015

Lawrence A. Hosman, Ph.D.
Institutional Review Board
REFERENCES


