

THE IMPACT OF THE BROAD AUTISM PHENOTYPE ON SOCIAL
RELATIONSHIPS IN MOTHERS OF CHILDREN WITH AUTISM:
THE ROLE OF MATERNAL ATTACHMENT REPRESENTATIONS

by

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ABSTRACT

Parenting a child with autism spectrum disorder (ASD) can be stressful, impacting the overall parenting experience and relationship well-being. Mothers of children with ASD are at increased risk for inadequate social support and mental health problems, as well as exhibiting characteristics of the broad autism phenotype (BAP). The BAP is a milder subset of ASD symptoms that include rigidity, aloofness, and struggles with social relationships. Individuals with BAP report less satisfying relationships, more mental health problems, and a higher chance for insecure attachment. No studies have looked at the relationship between BAP, adult attachment, and relationship outcomes in mothers of children with ASD. This study included 114 mothers (mean age = 35) who completed questionnaires online measuring the aforementioned variables. I found that mothers with higher BAP experienced higher attachment anxiety and avoidance. Further, higher BAP predicted poorer outcomes, with attachment avoidance and anxiety mediating many of these outcomes.

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INTRODUCTION

In 2014, the prevalence rate of autism spectrum disorder (ASD) rose to 1 in 68 children (CDC, 2014). Multiple studies have reported that caregivers struggle with parenting their children with ASD, usually at great personal cost (e.g., Benson, 2006). Parents of children with ASD report poorer mental health compared to parents of children with other developmental disabilities and parents of typically developing children (Olsson & Hwang, 2001). Furthermore, families of children with ASD report greater stress and lower levels of overall family functioning (Higgins, Bailey, & Pearce, 2005). One possible explanation for this heightened stress is the presence of the broad autism phenotype (BAP), which is defined as subclinical ASD symptoms that often manifest in family members of children with ASD (Losh, Childress, Lam, & Piven, 2008). While researchers know that parenting a child with ASD is a uniquely stressful parenting experience, understanding the mechanisms has proven more difficult.

There are considerable individual differences in how parents respond to the challenges associated with raising a child with ASD. While some parents struggle and show lower levels of well-being, others parents have shown resilience and favorable outcomes. One explanation that could explain these differences is the parent's attachment style. Attachment theory states that early examples of caregiving relationships can explain the quality of later intimate relationships throughout adulthood (Ainsworth, 1978; Bowlby, 1969; Main, Kaplan, & Cassidy, 1985). The current study sought to examine adult attachment styles in mothers of children with ASD. Specifically, this study examined the role of adult attachment in the relationship between BAP characteristics

and maternal outcomes, including mental health and quality of social relationships.

Attachment

Bowlby (1969) proposed that the bond between an infant and his mother is based on the mother being able to meet the physiological needs of the infant. Through this ethological perspective, Bowlby postulated that infants' attachment system is activated during times of distress and that infants use attachment behaviors (e.g., crying, smiling) to gain proximity to their caregiver. Conversely, when there are no perceived threats, the infant's exploratory system is activated and children use their caregiver as a secure base from which to explore. These behaviors are strongest during infancy but decrease in frequency and intensity throughout childhood. Through these interactions, infants develop internal working models of intimate relationships, which are then applied as a conceptual framework for relationships throughout the lifetime.

As an infant, the quality of attachment can be assessed using the concept of attachment security (Ainsworth, 1978). That is, when the attachment figure, usually the mother or primary caregiver, is able to provide comfort to the distressed infant through sensitive parenting and the infant is able to resume exploration, then that child would be considered to have a secure attachment. Infants are thought to have an insecure attachment when they do not receive appropriate comfort from the attachment figure when distressed, thus resulting in their inability to return to exploration (Ainsworth, 1978). Insecure attachment is separated into two types: anxious-avoidant attachment and anxious-ambivalent attachment. Infants who demonstrate anxious-avoidant attachment do not seek comfort from the caregiver when distressed by seeking proximity. Infants who show anxious-ambivalent attachment, however, seek proximity to the caregiver, but are

not able to be comforted by the caregiver. In fact, these infants often show anger, or resistance, toward the parent (Ainsworth, 1978).

The quality of the attachment relationship predicts a variety of developmental outcomes. For example, Sroufe (2005) postulated that attachment is the foundation for self-reliance, or independence, emotional regulation, and social competence. In early childhood, attachment security was related to enhanced social problem-solving and less loneliness (Raikes & Thompson, 2008). Disturbances in the mother-child relationship, such those potentially caused by attachment insecurity, can alter brain circuitry associated with emotional regulation (Moutsiana et al., 2014). This, in turn, can impact adjustment through adulthood.

Attachment in childhood is strongly related to attachment behaviors in adulthood, shown both through close relationships with peers and romantic partners as well as through parenting (Fraley, 2002; Main, 2000; van IJzendoorn, 1995). Though developmental psychologists usually assess adult attachment via intensive interviews, social psychologists utilize self-report measures. While these interviews result in classifications that directly align with infant attachment classifications, social psychologists depend on two primary continuums to assess attachment security: avoidance and anxiety (Brennan et al., 1998). Avoidance involves “discomfort with closeness or dependency” while anxiety refers to “anxiety about abandonment” (Brennan et al., 1998, p. 48). Low scores of avoidance and anxiety indicate secure attachment while high scores of avoidance and anxiety indicate insecure attachment.

Adult attachment can affect a number of outcomes related to interpersonal relationships. As discussed earlier, early interactions with the caregiver can predict later

relationships with romantic partners and peers as well (Zayas et al., 2010).

Fundamentally, those who display secure or insecure attachment styles have internal representations about how people react in relationships (Hazan & Shaver, 1987).

Specifically, their expectations for trust from their partner, the course of the relationship, and their own worthiness for accepting love are significantly impacted by their attachment style. Romantically, those with a secure attachment are more likely to report higher relationship satisfaction and relationship intimacy (Mikulciner, Florian, Cowan, & Cowan, 2007). Securely attached partners are more likely to disclose as well and respond well to their partner's disclosures. With friendships, those who display attachment security are more likely to trust their friends, have mutually satisfying friendships, and use more effective conflict management strategies (Mikulciner & Shaver, 2007).

Conversely, those who exhibit insecure attachment experience less friendship satisfaction.

Attachment insecurity can also increase the risk for mental health problems in adulthood. Insecure attachment is associated with increased risk for depression, especially when reflecting different profiles of avoidance and anxiety (Cyranowski et al., 2002). For example, Roberts, Gotlib, and Kassel (1996) reported that having an insecure attachment led to depressive symptoms. This was explained as attachment insecurity leading to dysfunctional attitudes about self-worth and self-esteem. Parents may be particularly vulnerable to experiencing certain aspects of parenting as stressful according to their attachment style. Parents with avoidant attachment styles were more likely to experience greater parenting stress and less satisfaction in the experience of parenting (Rholes, Simpson, & Friedman, 2006). Parents who showed attachment ambivalence

were also more likely to find parenthood stressful and report depressive symptoms (Simpson, Rholes, Campbell, Tran, & Wilson, 2003). Therefore, the current study sought to incorporate attachment representations as a way to better understand social relationships and mental health outcomes of mothers of children with autism.

Autism and Parenting

ASD is a developmental disability that impairs social skills and communication and is accompanied by restricted repetitive behaviors (American Psychiatric Association, 2013). Specifically, children with ASD struggle with connecting with others and forming social relationships. This can manifest itself in failing to respond to social cues and struggling with spontaneous social interaction. Other children may have difficulty communicating clearly or using words at all. Restricted repetitive behaviors include stereotypic behaviors of the child, narrow interests, and limited activities. Children with ASD also display comorbid behavior problems, such as aggression and temper tantrums. This collection of behaviors has been found to be particularly challenging for parents (e.g., Hastings, 2003).

Parents generally report that caring for a child with ASD is tremendously stressful, resulting in lower parental well-being. In fact, parents of children with ASD report significantly higher levels of stress and depression than parents of other developmental disabilities (e.g., Griffith, Hastings, Nash, & Hill, 2010; Olsson & Hwang, 2001; Pisula, 2007). A wealth of studies has shown that these mothers are more likely to be both highly stressed (e.g., Brobst, Clopton, & Hendrick, 2009; Davis & Carter, 2008; Ekas & Whitman, 2010; Griffith et al., 2010; etc.) and exhibit clinical levels of depression (e.g., Benson, 2006; Hastings & Brown, 2002; Zablotsky, Bradshaw, &

Stuart, 2012). Indeed, Benson (2006) found that greater than 50% of the parents of children with ASD were clinically depressed. Weitlauf, Vehorn, Taylor, and Warren (2014) suggested that maternal depression should be interpreted as a reflection of the distress experienced by parents as opposed to being caused directly by specific child symptoms or externalizing behaviors.

Previous studies have found certain elements of parenting a child with ASD to be differentially stressful. For example, Davis and Carter (2008) found that both mothers and fathers of children with ASD found their child's social impairments to be most stressful. Other child characteristics found to be especially stressful were self-regulation skills and externalizing behaviors. Though it is true that core ASD symptoms add to the stress experienced by parents of children with ASD, more recent research has indicated that child behavior problems might be a better indicator for increased parental stress (e.g., Ekas & Whitman, 2010). Hastings (2003) suggested that child behavior problems were highly associated with maternal stress.

Having a child with ASD in the family also impacts overall family functioning. Ideally, a family has a balance of cohesion and adaptability. Cohesion is the emotional bonding within a family, while adaptability is a family's ability to adapt to challenges. Specifically, cohesion ranges from enmeshment, or over-involvement, to disengagement, or under-involvement (Minuchin, 1974). Adaptability and flexibility, on the other hand, ranges from rigidity, or having too much structure, to chaos, or having too little structure (Olson, 2000). Family stress theory, when families balance the burden placed upon them by demands in their environment with protective factors, illustrates a concept generally known as resilience (Patterson, 2002). For families of children with ASD, Higgins and

colleagues (2005) discovered that they responded to stress with lower cohesion and adaptability. However, those families who had higher levels of cohesion and adaptability were better equipped to cope with difficulties, as Patterson (2002) suggested in his family stress theory. Families of children with ASD who had both high cohesion and high adaptability were more likely to use positive coping strategies (Altiere & von Kluge, 2009). Interestingly, as well, the families with higher enmeshment also reported using more positive coping strategies, suggesting that the family functioning relationships with these families are particularly unique.

Even though parents of children with ASD are at greater risk for impairments in family relationships, many parents are resilient and withstand the negative effects. Finding resilient qualities in these parents has recently been a strong research focus. Areas of focus have included marital satisfaction, social support, and parenting self-efficacy, among other elements (e.g., Altiere & von Kluge, 2009; Teti & Gelfand, 1991; Tobing & Glenwick, 2006). Resilience is displaying adaptive outcomes despite facing some type of challenge, which in this case would include having a child with ASD (Bekhet, Johnson, & Zuasniewski, 2012). Much of the research surrounding resilience focuses on identifying protective factors that may buffer the negative effects of raising a child with ASD. The current study interpreted attachment representations as a way to understand how some mothers of children with ASD may exhibit resilience in their social relationships and mental health outcomes.

One particular source of resilience in parents of children with ASD is perceived social support. When parents used social support resources, such as through support groups, formal services, or support from friends, they were less likely to have poor

mental health (Zablotsky et al., 2012). Tobing and Glenwick (2006) reported the presence of social support was correlated with lower parental distress. Another studied dimension of social support for these parents includes the satisfaction with the perceived social support. For example, Brobst and colleagues (2009) found that parents of children with ASD were more likely to report more behavior problems, more parenting distress, and lower relationship satisfaction.

Implications for social support in parents of children with ASD can extend to the marital relationship as well. Instead of seeing ASD as an impetus for marital conflict and lower marital satisfaction, research has shown that negativity about the child with ASD might not be related to marital relationship quality (Brobst et al., 2009; Lickenbrock, Ekas, & Whitman, 2010;). For example, mothers who report higher marital adjustment also reported more positive perceptions of the child with ASD (Lickenbrock et al., 2010). Additionally, compared to parents of typically developing children, parents of children with ASD reported similar levels of perceived spousal support, respect, and commitment (Brobst et al., 2009). However, an association existed between lower marital relationship satisfaction and quality with parenting stress and child behavior problems. Additionally, Hartley, Barker, Seltzer, Greenberg, and Floyd (2011) found that with less marital satisfaction, parents of children with ASD reported higher levels of parenting burden, though this effect was stronger for fathers than for mothers. Finally, in these parents, marital relationship quality and satisfaction can buffer the effect of caregiving stress on parental mental health (Weitlauf et al., 2014). Conversely, a struggling marital relationship can impact parental mental health more strongly than child behavior

problems or ASD symptom severity. Therefore, the couple's relationship with each other is a significant element of the parenting experience for parents of children with ASD.

Additionally, self-efficacy beliefs can exacerbate parenting stress. Parenting self-efficacy is the perception of one's ability to meet parenting challenges and behave competently. Self-efficacy beliefs are also related to attachment security, with parents who are insecurely attached reporting lower self-efficacy (Kohlhoff & Barnett, 2013). Maternal self-efficacy beliefs mediate the relationship between parenting behaviors and the mental health of parents in general (Teti & Garland, 1991). In parents of children with ASD, self-efficacy mediated the relationship between child behavior problems and parental anxiety and depression (Hastings & Brown, 2002). Additionally, Benzies, Trute, and Washington (2013) reported that maternal self-efficacy also predicted family adjustment. Thus, elements such as parenting efficacy, family functioning and social support are very closely related and were all included in the current study.

Broad Autism Phenotype

Of particular interest to the current study is the potential influence of broad autism phenotype (BAP) on social relationships, a subset of milder ASD symptoms including aloofness and rigidity that manifest themselves in family members of children with ASD. Since BAP characteristics are more common in multiple-incidence ASD families than in single-incidence ASD families (Losh et al., 2008), researchers have concluded that some traits of ASD might be genetic. Additionally, about 25% of parents of children with ASD exhibit BAP traits (Hurley, Losh, Parlier, Reznick, & Piven, 2007). Research has demonstrated that BAP qualities are associated with poorer mental health (Ingersoll, Meyer, & Becker, 2011; Kunihiro, Senju, Diaroku, Wakabayashi, & Hasegawa, 2006;) as

well as increased parenting stress (Ingersoll & Hambrick, 2011). Ingersoll et al. (2011) found that both stress and BAP characteristics might put mothers of children with ASD at higher risk for depression. Specifically, parenting stress and maternal BAP accounted for the relationship between having a child with ASD and depression. This connection between BAP characteristics and increased risk for depression provided the foundation for the current study's focus on understanding the experiences of parents of children who ASD who also report high levels of BAP. However, the current study also sought to understand the impact of BAP characteristics on mothers' social relationships.

Social relationships are an important part of understanding why parents with high levels of BAP are at risk for negative mental health outcomes. Ingersoll and Hambrick (2011) found that the relationship between BAP status and depression was partially mediated by the presence of maladaptive coping or social support. Indeed, if parents with BAP characteristics did report adequate social support, they were less likely to be depressed. However, receiving an adequate level of social support can be a struggle for parents who show BAP traits. Since the BAP includes social and communication deficits, relatives with BAP reported lower levels of social support (Piven, Palmer, Jacobi, Childress, & Arndt, 1997). Additionally, the presence of more BAP characteristics has been linked with lower relationship satisfaction (Pollmann, Finkenauer, & Begeer, 2010) and less attachment security, including higher anxiety and higher avoidance, in nonclinical samples (Lamport & Turner, 2014). Individuals with BAP characteristics also reported more loneliness and friendships of a shorter duration (Jobe & White, 2007). Thus, the current study sought to explain how attachment could be a viable mechanism to

explain the impaired social relationships that may arise as a result of high levels of BAP characteristics.

Autism and Attachment

Another significant influence on parental mental health as well as the quality of the parent-child relationship is attachment styles in ASD populations. Though the distribution of security versus insecurity is different in ASD populations, attachment theory is still applicable to these children (Haltigan, Ekas, Seifer, & Messinger, 2010; Koren-Karie, Oppenheim, Dolev, & Yirmiya, 2009; Rutgers et al., 2004). However, children with greater symptom severity are at greatest risk for attachment insecurity. Naber, Swinkels, and Buitelaar (2007) reported that with greater symptom severity, children with ASD were more insecure and had lower stress responses when separated from the parent. With greater parental sensitivity, however, children with ASD were more likely to attain attachment security (Koren-Karie et al., 2009; Capps et al., 1994).

Not as much information exists about the attachment style of parents with ASD and how attachment might affect their mental health and quality of social relationships. Parent interviews assessing parental attachment views did relate to parenting behaviors (Seskin et al., 2010), implying that adult attachment is still an important concept within the ASD context for these parents. Indeed, Goodman and Glenwick (2012) investigated the effect of attachment on parenting a child with ASD. Adult attachment was found to predict the overall parenting experience more so than the perceived attachment of the child to the parent. Looking specifically at how ASD symptoms or functional impairments impact attachment, when functional impairment was greater, parents reported less attachment to their child and perceived their child as being less attached to

the parent. This might be related to the finding that parents who felt more competent felt more attached to their child. The strongest contributions to variance of stress and parenting sense of competence, after controlling child age and diagnosis, were the child's affective attachment to the parent, the parent's affective attachment to the child, and the perceptions of the child's functional impairment (Goodman & Glenwick, 2012). These results imply that studying attachment in parents of children with ASD can lend better understanding to their overall mental health and parenting experience.

The Present Research

The current study explored how attachment style could be used as a mechanism to explain parenting outcomes in mothers of children with ASD. The major focus of the current study was whether the relationship between mothers' BAP characteristics and maternal relationship well-being was mediated by their levels of attachment avoidance and anxiety. First, it was hypothesized that, as shown in previous research, BAP symptoms would predict poor relationship outcomes. Second, individuals' BAP symptoms would predict increased attachment avoidance and anxiety. Finally, the relationship between BAP symptoms and maternal relationship outcomes would be mediated by attachment avoidance and anxiety.

METHOD

Participants

Participants consisted of mothers ($n = 114$) with a child with ASD. Children ranged in age from 2 to 17 years of age, with a mean age of 8 years ($SD = 3.32$). Mothers ranged from 25 to 56 years of age, with a mean age of 38 years ($SD = 6.34$). The children

were primarily male (83%). Participant's racial background was primarily Caucasian (81%) with 10% of mothers identifying as Hispanic or Latino and 6% identifying as African American. Most mothers were married (78%) with 15% separated or divorced and 7% single. Further, the majority of mothers completed some form of higher education, with 24% of participants completing some college, 43% earning an undergraduate degree, and 27% earning a graduate degree. Twenty percent of mothers reported a household income of less than \$40,000 a year and 20% of mothers reporting a household income of less than \$40,000 a year, 34% of mothers reported a household income of over \$100,000 a year, with 46% of the remaining mothers reporting a household income between \$40,000 and \$100,000 a year.

Procedure

Participants were recruited online via social media sites, blogs, and via word of mouth. After expressing interest in the study, mothers were provided a unique link to complete the online survey. Upon completion of the questionnaires, mothers were compensated with a \$10 gift card for a national retailer.

Measures

Attachment. Participants completed the Experiences in Close Relationship Inventory (ECR; Brennan et al., 1998), which includes 36 items on a 7-point Likert scale (1 = *disagree strongly*; 7 = *agree strongly*). Ten of the 36 items were reverse coded. Two subscales representing attachment avoidance and anxiety were calculated. The attachment avoidance subscale represented the average of 18 items (e.g., "Just when someone starts to get close to me I find myself pulling away;" $\alpha = .93$), with higher scores reflecting higher attachment avoidance. The attachment anxiety subscale was the average of the 18

remaining items (e.g., “I worry about being rejected or abandoned;” $\alpha = .92$), with higher scores reflecting higher attachment anxiety.

Maternal mental health. Participants completed the Center for Epidemiologic Scales Depression Scale (CES-D; Radloff, 1977) to assess their mental health. The CES-D includes 20 items asking mothers to rate the frequency of experiencing emotions and behaviors within the past week using a 4-point Likert scale ($0 = \text{rarely or none of the time}$; $3 = \text{most or all of the time}$), with four items reverse coded. A total CES-D score was calculated by taking the sum of all 20 items ($\alpha = .92$). A sample item is “During the past week, I thought my life had been a failure.” A score a sixteen or higher is used as a cut-off to indicate the possibility of clinical depression.

Family functioning. Two questionnaires were administered to assess family dynamics. Participants completed the Family Adaptability and Cohesion Scales (FACES-IV; Olson, Gorall, & Tiesel, 1985), which included 42 items on a 5-point Likert scale ($1 = \text{does not describe our family at all}$; $5 = \text{very well describes our family}$), with six subscales of seven items each. This study used two subscales to measure family cohesion (e.g., “Family members feel very close to each other; $\alpha = .89$) and flexibility (e.g., “We shift household responsibilities from person to person; $\alpha = .84$). Higher scores on the cohesion and flexibility subscales indicated more positive family functioning.

The Family Implications of Childhood Disability Scale (FICD; Trute & Hiebert-Murphy, 2002), is comprised of 15 items on a 4-point Likert scale ($1 = \text{not at all}$; $4 = \text{to a substantial degree}$). Two subscales were created to represent positive and negative implications. The positive subscale was calculated by summing five items (e.g., “It has brought us closer to God;” $\alpha = .70$), and the negative subscale was calculated by

summing 10 items (e.g., “There has been unwelcome disruption to ‘normal’ family routines;” $\alpha = .90$).

Social relationships. Participants also completed two questionnaires regarding their social relationships. This included completing the Couple Satisfaction Index (CSI; Funk & Rogge, 2007), which includes one item on a 7-point Likert scale (0 = *extremely unhappy*; 6 = *perfect*) and 31 items on a 6-point Likert scale (in general, scale anchors varied, with 0 = *lower or negative qualities*; 5 = *higher or positive qualities*). Seven items were reverse coded, with higher scores indicating higher marital satisfaction. A sample item is “In general, how often do you think that things between you and your partner are going well.” A total CSI score was calculated taking the sum of all 32 items ($\alpha = .98$).

Social support was also measured using the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988), which included 12 items on a 7-point Likert scale (1 = *very strongly disagree*; 7 = *very strongly agree*). The total MSPSS score was calculated by averaging all items ($\alpha = .94$). Three subscales were created by averaging four items in each subscale: friends social support (e.g., “My friends really try to help me;” $\alpha = .96$), family social support (e.g., “I can talk about my problems with my family;” $\alpha = .93$), and significant other social support (e.g., “There is a special person who is around when I am in need;” $\alpha = .95$).

Parenting experience. Participants completed the Parenting Sense of Competence Scale (PSOC; Johnston, & Mash, 1989), to assess aspects of the parenting experience. The PSOC is comprised of 17 items on a 6-point Likert scale (1 = *strongly disagree*; 6 = *strongly agree*). Nine items were reverse coded, with higher scores indicating greater parenting competence. This study focused on two subscales measuring

parenting efficacy and parenting satisfaction. The parenting efficacy subscale was created by summing eight items (e.g., “Being a parent is manageable, and any problems are easily solved;” $\alpha = .79$) while the parenting satisfaction subscale was created by summing the nine reverse coded items (e.g., “Even though being a parent could be rewarding, I am frustrated now while my child is at his/her present age;” $\alpha = .75$).

Maternal broad autism phenotype. Participants completed the Broad Autism Phenotype Questionnaire (BAPQ; Hurley, Losh, Parlier, Reznick, & Piven, 2007), which includes 36 items on a 6-point Likert scale (1 = *very rarely*; 6 = *very often*). Fifteen items were reverse coded, with a higher score indicating more BAP symptoms. A sample item is “I would rather talk to people to get information than to socialize.” A total BAPQ score was calculated by averaging all 36 items ($\alpha = .94$). Though subscales exist for different elements of BAP symptoms, this study only used the total score.

RESULTS

Covariate Analyses

To identify potential covariates to include in analyses, relationships between demographics (parent age, household income, parent education, marital status, parent ethnicity, child age, and child gender) and the identified outcome variables were examined. Parent ethnicity was significantly associated with depressive symptoms, $F(1, 111) = 7.33, p < .01$, with non-Hispanic mothers ($M = 18.05, SE = 1.15$) reporting significantly more depressive symptoms than Hispanic mothers ($M = 8.63, SE = 2.23$). No other significant associations were found. Thus, parent ethnicity was included as a covariate when depressive symptoms were included in the mediational model.

Descriptive Statistics and Correlations

Descriptive statistics for all variables of interest are reported in Table 1.

Correlations among variables of interest were also examined, as reported in Tables 2 and 3. BAP characteristics were associated with higher attachment anxiety and avoidance, as well as higher marital satisfaction, depressive symptoms, and negative perceptions of the child's disability's impact on the family. Mothers with high levels of BAP also had less parenting satisfaction, friend support, family support, spousal support, family cohesion, family flexibility, and positive perceptions of the child's disability's impact on the family. However, BAP was not related to parenting efficacy ($r = -.15, p = .12$).

Both attachment anxiety and avoidance were related to a variety of outcomes. As expected, attachment anxiety and avoidance were moderately correlated ($r = .46, p \leq .001$) but were not collinear. Attachment anxiety was related to greater depressive symptoms and more negative perceptions of the child's disability's impact on the family. Attachment anxiety was also associated with lower marital satisfaction and less parenting satisfaction, friend support, family support, family cohesion, family flexibility, and positive perceptions of the child's disability's impact on the family. However, attachment anxiety was not significantly correlated with spousal support ($r = -.17, p = .07$) or parenting efficacy ($r = -.06, p = .51$). Similar to attachment anxiety, attachment avoidance was also related to greater depressive symptoms. It was also negatively associated with marital satisfaction, parenting satisfaction, friend support, family support, spousal support, family cohesion, family flexibility, and positive perceptions of the child's disability's impact on the family. Attachment avoidance was not significantly

related to negative perceptions of the child's disability's impact on the family ($r = .16, p = .08$) or parenting efficacy ($r = -.13, p = .18$).

Mediation Analyses

After exploring correlations between variables of interest, mediation was chosen for analyses, with attachment anxiety and avoidance entered into separate models as mediators using Hayes' (2012) bootstrapping procedure. This analysis plan examined whether attachment anxiety and avoidance mediated the relationship between BAP symptomology and relationship and mental health outcomes. However, these analyses did not include parenting efficacy in either analysis due to the non-significant relationship between parenting efficacy and attachment avoidance and anxiety. Spousal support was also not included when attachment anxiety was entered as a mediator nor were negative perceptions of the child's disability's impact on the family when attachment avoidance was entered as a mediator. Again, this decision was made due to the lack of significant correlation between the aforementioned variables.

The significant mediation models when attachment anxiety was entered as a mediator are included in Table 5. For the included outcome variables, attachment anxiety mediated the relationship between BAP symptomology and marital satisfaction, positive and negative perceptions of the child's disability's impact on the family, parenting satisfaction, and family flexibility. For all variables, greater levels of BAP symptomology predicted increased attachment anxiety. Increased attachment anxiety, in turn, predicted lower marital satisfaction, less positive perceptions of the child's disability's impact on the family, lower parenting satisfaction, and lower family flexibility. Increased attachment anxiety also predicted more negative perceptions of the child's disability's

impact on the family. In most cases there was evidence for full mediation, as shown by the lack of a relationship between BAP symptomology and marital satisfaction, positive and negative perceptions of the child's disability's impact on the family, parenting satisfaction, and family flexibility. One thousand bootstrap resamples were performed, and the 95% confidence intervals obtained did not contain zero, supporting the conclusion that mediation existed.

Attachment anxiety did not mediate the relationship between BAP qualities and levels of perceived social support, both for support received from the family and support received from friends. Further, attachment anxiety mediated the relationship between BAP characteristics and family flexibility, but did not mediate relationship between BAP characteristics and family cohesion. In addition, attachment anxiety did not mediate the relationship between BAP symptoms and depressive symptoms.

The significant mediation models when attachment avoidance was entered as a mediator are included in Table 4. Attachment avoidance was found to fully or partially mediate the relationship between BAP symptomology and each outcome variable. Attachment avoidance mediated the relationship between BAP characteristics and marital satisfaction, depressive symptoms, positive perceptions of the child's disability's impact on the family, parenting satisfaction, spousal and family support, and family cohesion and flexibility. For all mediation models, higher levels of BAP symptoms predicted higher levels of attachment avoidance overall. Further, increased attachment avoidance predicted lower marital satisfaction, lower parenting satisfaction, lower family cohesion and flexibility, less spousal, friend, and family support, less positive perceptions of the child's disability's impact on the family, and more depressive symptoms. In some cases,

there was evidence for full mediation, as shown by the lack of a relationship between BAP symptomology and marital satisfaction, parenting satisfaction, family cohesion and flexibility, spousal and family support, positive perceptions of the child's disability's impact on the family, and depressive symptoms. However, for friend support, the relationship with BAP symptoms remained significant, indicating partial mediation. One-thousand bootstrap resamples were performed, and the 95% confidence intervals obtained did not contain zero, supporting the conclusion that mediation existed.

DISCUSSION

The current study sought to understand the impact of BAP symptoms on maternal attachment representations, social relationships, and mental health status of mothers of children with ASD. Consistent with previous research, this study found a relationship between BAP symptoms and difficulties with several outcomes, including marital satisfaction, perceived social support, depressive symptoms, perceptions of the child's disability's impact on the family, family functioning, parenting satisfaction, and attachment avoidance and anxiety. These results are consistent with previous research (e.g., Pollmann et al., 2010) conducted with a nonclinical sample. BAP symptoms typically include rigidity, aloofness, and difficulty in social relationships. Therefore, it is not surprising that we found these characteristics impacted the quality of mothers' relationship satisfaction, both with the marriage and with the parent-child relationship, as well as predicting lower social support. In past research, mothers of children with ASD have been reported to experience lower marital satisfaction when experiencing greater parenting stress (Hartley et al., 2011). Mothers of children with ASD also have been found to struggle with receiving adequate social support (e.g., Brobst et al., 2009).

Previous research suggests that individuals with elevated BAP symptoms also experience lower relationship satisfaction and report less social support (e.g., Piven et al., 1997). Therefore, for mothers of children with ASD, higher levels of BAP symptomology may explain these difficulties with social relationships.

BAP symptoms were also shown to be related to family dynamics, including lower family functioning, less positive perceptions of the child's disability's impact on the family, and more negative perceptions of the child's disability's impact on the family. My findings on family functioning are consistent with previous research, which suggests that families of children with ASD report lower family cohesion and flexibility (Higgins et al., 2005). BAP's likelihood of manifesting itself in relatives of children with ASD may explain this trend. Further, positive perceptions about the child with ASD have previously been shown to be a protective factor when parents report higher stress (Lickenbrock et al., 2010). Exhibiting elevated BAP symptoms might put mothers of children with ASD at higher risk for not demonstrating resilient attributes.

Mothers with high levels of BAP symptoms were found to also report poorer mental health. This is consistent with previous research that mothers of children with ASD with high BAP are at increased risk for depression (Ingersoll et al., 2011). According to Ingersoll and Hambrick (2011), reporting inadequate social support along with parenting stress led to an increased risk for depression. In addition, this study's findings that BAP symptoms impacted the quality of social relationships may also explain the elevated depressive symptoms. It is possible that BAP characteristics may prevent mothers from forming supportive relationships that could help to prevent the onset of depression.

I was particularly interested in the relationship between BAP symptoms and attachment anxiety and avoidance. In this study, mothers with high levels of BAP characteristics were found to have higher levels of anxiety and avoidance. These findings are consistent with previous research conducted with nonclinical samples (Lamport & Turner, 2014). Additionally, consistent with previous research (e.g., Cyranowski et al., 2002), both high levels of BAP characteristics and high attachment anxiety and avoidance were associated with greater depressive symptoms. Parents of typically developing children who exhibit higher attachment insecurity report greater parenting stress and more depressive symptoms (Simpson et al., 2003). The results of this study support similar findings in mothers of children with ASD who also exhibit high BAP symptoms.

This study was primarily interested in examining whether mothers' attachment representations explained the relationship between BAP symptoms and maternal outcomes. Specifically, attachment avoidance and anxiety were proposed as mediators impacting these relationships. The results confirmed that attachment anxiety and avoidance mediated the relationship between BAP characteristics and certain relationship outcomes. Attachment anxiety mediated the associations between BAP symptoms and marital and parenting satisfaction, perceptions of family functioning related to the child's ASD, and family flexibility. Attachment avoidance mediated the relationship between BAP characteristics and perceived social support from family, friends and the spouse, depressive symptoms, marital and parenting satisfaction, and family functioning. The direction of these effects is consistent with attachment theory (Bowlby, 1969). Mothers with elevated BAP symptoms may display aloof and rigid interaction styles, which can

influence the reciprocal bonds they form within their daily lives. Therefore, it could be argued that BAP symptoms influence the internal working models of these mothers. These mothers' altered attachment representations compounded with their parenting experiences might then place them at increased risk for poor relationship and mental health outcomes.

It was surprising that BAP symptoms were not related to parenting efficacy or negative perceptions of the child's ASD's impact on the family. Previous research indicates that parents who demonstrate greater attachment avoidance and anxiety report lower parenting self-efficacy (e.g., Kohlhoff & Barnett, 2013). Perhaps, although individuals with BAP appear aloof and rigid, BAP does not affect their ability to parent effectively, but perhaps decreases the emotional connection. This could be reflected in lower reported parenting satisfaction in the current study. Further, aloofness resulting from BAP may not necessarily increase individuals' amount of expressed negativity. It was also interesting that for mothers with high levels of BAP symptoms, attachment avoidance was found to mediate more of the proposed relationship outcomes than did attachment anxiety. This may better explain which elements of attachment insecurity BAP individuals exhibit by highlighting the distinction between attachment anxiety and attachment avoidance.

Limitations and Future Directions

Although this was a novel study with significant findings, there were several limitations that warrant discussion. First, analyses revealed that ethnicity was a covariate for depressive symptoms as an outcome variable. When depressive symptoms were included as a part of the model, ethnicity was included as a covariate. However, it should

be noted that ethnicity only assessed whether or not the individuals were Hispanic. Though attachment avoidance was found to mediate the relationship between BAP symptoms and depressive symptoms, these results might be affected by an uneven distribution of Hispanic versus non-Hispanic mothers in the current study. Further research is needed with a larger sample of Hispanic mothers to determine if the relationships are similar across ethnic groups. Second, mothers were not excluded from analyses if their child's ASD did not currently meet criteria for the disorder or if the mothers did not exhibit clinical level BAP symptoms. In order to be included in the study, however, the children must have received a diagnosis of ASD at some point in their developmental history. Therefore, although a small number of children may not currently meet criteria for a diagnosis, this may be due to extensive treatment or the self-report nature of the measure we used. Future studies should strive to obtain a gold-standard, current diagnosis of ASD. With respect to mother's BAP symptoms, this sample of mothers may better reflect the broader experience of mothers of children with ASD as opposed to just reflecting those who do exhibit clinical levels of BAP symptoms.

This is the first study to examine attachment representations in mothers of children with ASD in connection to their social relationships and mental health. This study was also unique in that it included assessments of BAP symptoms in order to understand the mechanisms underlying the social difficulties and mental health problems that mothers of children with ASD often experience. Much research that has been done regarding attachment representations, social relationships, and BAP has used nonclinical samples of college students in making their conclusions (e.g., Lamport & Turner, 2014). By examining BAP characteristics and relationship outcomes in a sample that may be

particularly vulnerable to higher levels of BAP, mothers of children with ASD, I have shown that these relationships exist in a high-risk sample. Additionally, this study assessed relationship outcomes in multiple domains, including the relationships within the family. Assessing overall family functioning was particularly important to study considering the partially genetic nature of BAP (Losh et al., 2008).

These results have important implications for future interventions and research. Interventions for increasing social support and improving mental health outcomes in mothers with high levels of BAP might benefit from using an attachment perspective. Additionally, mothers of children with ASD might exhibit BAP characteristics themselves (Hurley et al., 2007), which may explain why they experience poorer mental health and social relationships. Future research should examine the attachment representations of both mothers of children with ASD and their partners. This would better assess the family environment of families who include a child with ASD. Further, a larger sample of mothers with high BAP characteristics may produce stronger indicators of the roles of attachment anxiety and avoidance in their social relationships.

Future research could also examine whether secure attachment is an indicator of resilience in mothers of children with ASD who exhibit elevated BAP characteristics. Perhaps, as insecure attachment representations were found to mediate the relationship between BAP symptoms and maternal outcomes, secure attachment representations may indicate which mothers are most impacted by their level of BAP characteristics.

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APPENDIX

Table 1

Descriptive Statistics

	Mean	SD	Minimum	Maximum
<u>Predictors</u>				
BAP	2.64	.75	1.14	4.89
<u>Mediators</u>				
Attachment Anxiety	3.23	1.21	1.00	6.50
Attachment Avoidance	3.07	1.13	1.06	6.50
<u>Outcomes</u>				
Marital Satisfaction	116.56	35.49	21.00	160.00
Depressive Symptoms	16.95	11.39	0	47.00
Parenting Satisfaction	37.24	7.56	16.00	54.00
Negative Perceptions	27.68	7.51	10.00	40.00
Positive Perceptions	14.49	3.36	7.00	20.00
Friend Support	5.30	1.45	1.00	7.00
Family Support	5.37	1.45	1.00	7.00
Partner/Spouse Support	5.88	1.33	1.00	7.00
Family Cohesion	27.05	5.83	9.00	35.00
Family Flexibility	20.32	5.77	7.00	34.00

Table 2
[Correlations Between Study Variables]

	1	2	3	4	5	6	7
1. BAP	--	.37***	.62***	.20*	.41***	-.23*	.19*
2. Attachment Anxiety	.37***	--	.46***	-.33***	.44***	-.29**	.24**
3. Attachment Avoidance	.62***	.46***	--	-.28**	.52***	-.31***	.16
4. Marital Satisfaction	.20*	-.33***	-.28***	--	-.38***	.54***	-.44***
5. Depressive Symptoms	.41***	.44***	.52***	-.38***	--	-.21*	.42***
6. Positive Perceptions	-.23*	-.29**	-.31***	.54***	-.21*	--	-.04
7. Negative Perceptions	.19*	.24**	.16	-.44***	.42***	-.04	--
8. Parenting Satisfaction	-.29**	-.46***	-.34***	.42***	-.44***	.27**	-.44***
9. Parenting Efficacy	-.15	-.06	-.13	.21*	-.15	.29**	-.17
10. Friend Support	-.42***	-.20*	-.42***	.23*	-.34***	.23*	-.14
11. Family Support	-.21*	-.20*	-.34***	.33***	-.31***	.25**	-.26**
12. Spouse Support	-.32***	-.17	-.40***	.49***	-.26**	.30***	-.19*
13. Family Cohesion	-.43***	-.44***	-.56***	.59***	-.44***	.40***	-.35***
14. Family Flexibility	-.23**	-.29**	-.39***	.43***	-.30***	.39***	-.29**

Note: * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Table 3
[Correlations between Study Variables, continued]

	8	9	10	11	12	13	14
1. BAP	-.29**	-.15	-.42***	-.21*	-.32***	-.43***	-.23**
2. Attachment Anxiety	-.46***	-.06	-.20*	-.20*	.17	-.44***	-.29**
3. Attachment Avoidance	-.34***	-.13	-.42***	-.34***	-.40***	-.56***	-.39***
4. Marital Satisfaction	.42***	.21*	.23*	.33***	.49***	.59***	.43***
5. Depressive Symptoms	-.44***	-.15	-.34***	-.31***	-.26**	-.44***	-.30***
6. Positive Perceptions	.27**	.29**	.23*	.25**	.30***	.40***	.39***
7. Negative Perceptions	-.44***	-.17	-.14	-.26**	-.19*	-.35***	-.29**
8. Parenting Satisfaction	--	.46***	.11	.22*	.28**	.36***	.32***
9. Parenting Efficacy	.46***	--	.11	.10	.15	.21*	.32***
10. Friend Support	.11	.11	--	.50***	.55**	.33***	.30***
11. Family Support	.22*	.10	.50***	--	.53***	.38***	.27**
12. Spouse Support	.28**	.15	.55***	.53***	--	.48***	.33***
13. Family Cohesion	.36***	.21*	.33***	.38***	.48***	--	.69***
14. Family Flexibility	.32***	.32***	.30***	.27**	.33***	.69***	--

Note: * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Table 4

[Models with Avoidance as Mediator]

Dependent Variable	a (SE)	b	c'	R ²	UL, LL
Marital Satisfaction	1.01(.14)***	-7.53*	-2.85	.04	-1.41, -14.61
Depressive Symptoms	.96(.11)***	4.59***	1.42	--	6.62, 2.62
Positive Perceptions	.93(.11)***	-.84*	-.25	.05	-.18, -1.53
Parenting Satisfaction	.94(.11)***	-1.74*	-1.34	.08	-.18, -3.43
Friend Support	.95(.11)***	-.33*	-.49*	.13	-.001, -.58
Family Support	.95(.11)***	-.45**	.03	.04	-.13, -.72
Spouse/Partner Support	.95(.11)***	-.39**	-.19	.09	-.11, -.62
Family Cohesion	.94(.11)***	-2.50***	-.97	.17	-1.42, -3.63
Family Flexibility	.94(.11)***	-2.11***	.17	.05	-.94, -3.17

Note: * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; R² not available for variables with covariates

Table 5

[Models with Anxiety as Mediator]

Dependent Variable	a (SE)	b	c'	R ²	UL, LL
Marital Satisfaction	.78(.17)***	-8.75*	-3.62	.04	-1.83, -14.10
Depressive Symptoms	.60(.14)***	3.04***	3.98***	--	3.36, .81
Positive Perceptions	.60(.14)***	-.65*	-.64	.03	-.13, -.85
Negative Perceptions	.60(.14)***	1.36*	1.06	.03	1.96, .17
Parenting Satisfaction	.60(.14)***	-2.54***	-1.45	.07	-.62, -2.79
Friend Support	.61(.14)***	-.05	-.77***	.04	.14, -.17
Family Support	.61(.14)***	-.18	-.29	.02	.01, -.31
Family Cohesion	.60(.14)***	-1.56***	-2.38***	.10	-.36, -2.13
Family Flexibility	.60(.14)***	-1.16*	-1.11	.04	-.14, -1.84

Note: * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; R² not available for variables with covariates