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Parental Mental Health: The Role of Parental Attachment to Their Child with ASD

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by

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Each person whose signature appears below certifies that this thesis in his/her opinion is adequate, in scope and quality, as a thesis for the degree Doctor of Philosophy.

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ABBREVIATIONS

ASD	Autism Spectrum Disorder
GARS	Gillian Autism Rating Scale
HLM	Hierarchical Linear Modeling
MAPS	Mindful Awareness Parenting Stress
MBSR	Mindfulness-Based Stress Reduction
PSI-SF	Parenting Stress Index Short Form
PRQ	Parenting Relationship Questionnaire
SUDS	Subjective Units of Distress Scale

ABSTRACT OF THE THESIS

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Doctor of Philosophy, Graduate Program in Clinical Psychology
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Dr. Cameron Neece, Chairperson

Research suggests that parents of children with an Autistic Spectrum Disorders (ASD) experience higher levels of stress than both those of typically developing children and children with other developmental disabilities. Parental stress may spill over into additional domains of parental competence, impairing parental mental health, and parents' ability to bond with their child. Little research has addressed the impact of the parent-child bond on parental stress. The current study used data from the Mindful Awareness for Parenting Stress project (MAPS) at Loma Linda University to further our understanding of parents' attachment to the child and parental stress examining whether parental attachment is a protective factor against parental stress. The proposed study included 39 parents of children with ASD. The results suggest that there were significant changes in parental stress, parent's ability to cope with stress, and in the area of the parent-child relationship. Future studies should place importance on identifying and targeting those parents with lower attachment, as they experienced higher gains across the intervention.

CHAPTER ONE

INTRODUCTION

Warmth, satisfaction, patience, love, and understanding are words that many parents would identify as positive aspects of their role in being a mother or father. While there are numerous joys associated with parenthood, parents must learn to balance work, married life, and the new responsibility of caring for a child. Finding this balance may become difficult during times of marital dispute, sickness, and economic hardship. Although this balancing act may be taxing for most individuals, parents of children with ASD experience a heightened level of stress as a result of the added responsibilities of caring for their child (Johnson et al., 2011; Hoppes & Harris, 1990). Parents of children with developmental disabilities typically report increased levels of stress (Baker, McIntyre, Blacher, Crnic, Edelbrock, & Low, 2003; Baxter, Cummins, & Yiolitis, 2000; Oelofsen & Richardson, 2006; Webster, Majnemer, Platt, & Shevell, 2008). Among parents of children with developmental delays, those whose children have ASD appear to have the highest levels of stress, primarily as a result of the behavior problems associated with the diagnosis (Eisenhower, Baker, & Blacher, 2005; Estes et al., 2009; Jang, Dixon, Tarbox, & Granpeesheh, 2011, Kozlowski & Matson, 2012). These parents often experience anxiety, depression, and self-blame in response to their child's difficulties (Johnson et al., 2011, Blackledge & Hayes, 2006). Moreover, the strain that these parents experience frequently extends into the home life and may ultimately impact the attachment relationship that they form with their child (Wheatley & Wille, 2008).

Despite the abundance of literature addressing the importance and benefits of attachment for the child, little research has addressed the positive aspects of the

attachment bond for the parent. In light of the increased stress experienced by parents of children with ASD, the current study examined aspects of the parent-child relationship, specifically parental attachment, which may buffer parental stress. For the purposes of the current study, parental-attachment is defined as the parents' level of empathy, closeness, and understanding of their children (PRQ; Kamphaus & Reynolds, 2006). The first goal of the study was to investigate the relationship between parental attachment and parental stress. The second goal was to examine how the parent-child attachment impacts the trajectory of stress across time. The third goal was to examine the stability of attachment from pre to post intervention. Lastly, our fourth goal was to investigate whether the parent's bond with their child moderates the efficacy of an empirically-supported stress reduction intervention for parents of children with ASD.

CHAPTER TWO

LITERATURE REVIEW

Autism Spectrum Disorder

According to the American Psychological Association, ASD is characterized by 1) deficits in social communication and social interaction and 2) restricted repetitive behaviors, interests, and activities (American Psychiatric Association, 2013). ASD encompasses Autistic Spectrum Disorder, Pervasive Developmental Disorder NOS, Asperger's Disorder, Childhood Disintegrative Disorder, and Rett's Disorder (APA, 2013). With regards to the current study, these areas of social impairment have been linked to a lower parental attachment towards their child with ASD (Howe, 2006; Coyne et al., 2006).

Attachment Theory

According to attachment theory, the bond formed between an infant and his or her caregiver serves as a template for future responses in novel situations (Weinfield et al., 2008). Through this interaction, the infant is able to communicate his or her need for physical contact and reassurance during periods of stress and anxiety (Rusk & Rothbaum, 2010). Once this need has been met, the infant is able to leave the caregivers' side in order to explore the new environment, which serves to create a sense of security with the primary caregiver (Rusk & Rothbaum, 2010). While it may be expected that this interaction would inevitably form between the infant and their caregiver, many parents find themselves struggling to form the appropriate bond. For parents of children diagnosed with ASD, creating a strong bond with their child can oftentimes be an

exhaustive and confusing undertaking (IJzendoor et al., 2007; Coyne et al., 2006). Parents of children diagnosed with ASD often feel that they are responsible for their child's medical condition, and frequently experience feelings of grief and guilt. Additionally, many individuals not only engage in self-blame, but also lay blame on their partner for the child's developmental delay (Blackledge & Hayes, 2006). Current research suggests parental feelings of guilt and grief negatively affect parents' ability to be efficacious in their role as a parent (Meirssschaut, Roeyers, and Warreyn, 2010). If parents' mental states inhibit them from functioning in their role as a parent, it is likely that they also struggle to exhibit the sensitivity and insight required to form a strong attachment bond with their child.

Parental Attachment: Sensitivity, Empathy, Closeness, and Understanding

While most attachment-based research focuses on the benefits of the relationship for the infant, it is crucial to examine the impact it has on the primary caregiver. The current study will examine parents' attachment to their children with ASD. For the purposes of this study, we have defined parental attachment towards children as the parents' level of empathy, closeness, and understanding of their children, based on Kamphaus and Reynold's definition (PRQ; Kamphaus & Reynolds, 2006). Empathy is derived from an individual's ability to understand and share the feelings of another individual. Coyne and colleagues (2006) assert that the ability to know the motives of a child helps form parental attitude and behaviors at the onset of the relationship. Knowing and recognizing the child's intentions and motives may be harder for parents of children with ASD, given that children with ASD do not display typical forms of emotion.

Parental empathy is derived from a parents' ability to understand and share the feelings of their child or infant, and when a child does not express emotions in an expected manner, parents may have difficulty understanding their feelings, thereby impairing parents' ability to empathize with their child (Coyne et al., 2006).

Child Attachment as a Protective Factor

When classifying infants, the terms secure and insecure do not describe the temperament or the behaviors of the child, but rather how the child perceives the availability of the parent when they are in distress. A child who is labeled as secure is one whose parents can be relied on to consistently provide comfort and support (Weinfield, Sroufe, Egeland, & Carlson, 2008). When children have a secure base on which to rely, they develop confidence in forming additional relationships and for exploring new situations without fear.

While children with ASD may have a hard time communicating with their parents through emotional displays, they are able to form strong attachment bonds with their primary caregivers. In previous manuals of the DSM, inability to form attachment was listed as a defining symptom of autism. Today, research indicates that 50% of children with ASD form secure attachments with their parents and it is widely believed that children with ASD are capable of developing attachments with their primary caregivers in the same way as the 65% of typically developing children who form secure attachments (Rutgers, et al., 2007; Rutgers, Bakermans-Kranenburg, van IJzendoorn, & Van Berckelaer-Onnes, 2004). While the rate of securely-attached children is lower in those with ASD (Naber, Swinkels, Builtelaar, Bakermans – Kranenburg, van IJzendoorn, Dietz, van Daaelen, & van Engeland, 2007), they are able to exhibit secure attachment

behaviors when distressed, and seek comfort from their mothers at appropriate times during the Strange Situation Task (Seskin, Feliciano, Tippy, Yedloutschnig, Sossin, and Yasik, 2010).

Parental Attachment

It is important to note that the term parental attachment will be used as a synonym for parental bonding. In research, the term parental attachment is frequently used to describe the child's security with his or her parent. Parental attachment, or bonding, as presented in the current study refers to the parent's attachment to his or her child.

Research suggests that the parent-child attachment bond has biological and psychological protective factors for the child, not only during infancy, but also across the lifetime (Ranson & Urichuk, 2008; Schore, 2002). One important benefit of a strong attachment bond between the child and the caregiver is a buffer from stress for the child, which has been demonstrated through lower levels of child cortisol production (Ranson & Urichuk, 2008). While previous research has focused on the importance of attachment for the child, less emphasis has been placed on the benefits of parental bonding for the parent.

As noted earlier, parental attachment is characterized by the parent's bonding to their child, which can be measured by parents' reported feelings of closeness. (PRQ; Kamphaus & Reynolds, 2006). Current research, with typically developing children, suggests that when a parent feels empathy, closeness, affection, and "emotional warmth" towards their child, they are less likely to experience stress within the parent-child relationship (Willinger, Diendorfer-Radner, Willnauer, Jörgl, & Hager, 2005). These

parents who exhibit more bonding with their children tend to report more feelings of self-worth, less stress in their role as a parent, and are also better at coping with familial and environmental stressors (Willinger, et al., 2005).

John Bowlby argued the infant-caregiver relationship is as important to the dyads' mental health as vitamins and proteins are to one's physical health (Taylor, Atkins, Kumar, Adams, and Glover, 2005). A key element of attachment theory is that attachment be reciprocal (Taylor et al., 2005). While it is common for mothers to experience a sense of detachment towards their child immediately after birth (Robson & Kumar, 1980, Kumar, 1997), most mothers quickly develop feelings of closeness and bonding within a few days after delivery (Kumar, 1997). Numerous studies emphasize the importance of attachment for the child (Schore, 2002; Ranson, & Urichuk, 2008), and detail the repercussions of a detached or emotionally unavailable mother (Hornstein et al., 2006; Figueiredo & Costa, 2009). While it is important to understand the negative repercussions of inadequate attachment relationships, there is a lack of research regarding the benefits of parental attachment for the parent. Additionally, while neonatal research indicates that maternal bonding can change within the first few weeks of the infant's life, there is a lack of research addressing the stability of parental bonding. The current study aimed to expand our understanding of the benefits of parental attachment with regards to stress in the parent-child relationship, and to investigate whether parental attachment is stable.

Parental Stress

Receiving a diagnosis confirming that one's child has ASD can be difficult for parents to accept. Most parents become aware of their child's developmental delay when

the child is at or around the age of one or two years old (Siklos & Kerns, 2007). A study conducted with 1,200 families of children with ASD reported that 40% of parents seek help because they are concerned with the development of their child's communication skills (Siklos & Kerns, 2007). Unfortunately, parents' stress may increase over the time it takes to receive the diagnosis. Not only is there difficulty in receiving an official diagnosis of ASD, on average parents see up to five specialists and may have to wait up to three years for the doctors to confirm their child's developmental delay (Moh & Magiati, 2011). Parents are not only subjected to stress during the long waiting period, but also in response to the diagnosis. The uncertainty and difficulty in gaining a consultation and diagnosis will likely leave parents confused, ultimately impeding their ability to help their child.

While all parents of children with developmental disabilities experience high levels of stress, the highest reports of parental stress are among parents of children with ASD (Baker-Ericzén, Brookman-Frazee, & Stahmer, 2005; Duarte, Bordin, Yazigi, & Mooney, 2005; Montes & Halterman, 2007; Rao & Beidel, 2009). The stress of having a child with ASD is further compounded by the behavior problems that co-occur with the child's delay (Eisenhower, Baker, and Blachner, 2005; Estes et al., 2009; Jang, Dixon, Tarbox, & Granpeesheh, 2011; Kozlowski & Matson, 2012). Many parents of children with developmental delays are classified as being clinically depressed (Oelofsen & Richardson, 2006; Olsson & Hwang, 2001; Webster et al., 2008) and report lower life satisfaction, more marital problems, less social support, and more mental health problems than parents of typically developing children (Gau, 2012; Benson & Karloff, 2009). Moreover, a reciprocal association has been identified between parental stress and children's behavior problems, which further exacerbates parental stress (Baker et al.,

2003; Neece, Green, & Baker, 2012; Moh & Magiati, 2011). Given the increased rates of stress experienced by parents of children with ASD, there is a compelling need to examine factors that may buffer and ameliorate this stress. While there may be a bidirectional effect between attachment and stress, the current study will focus on attachment as a predictor of stress in order to explore potential for additional factors in stress reduction.

CHAPTER THREE

METHODOLOGY

Examining Parental Attachment and Life Stressors

While much research addresses the importance of attachment for the child, minimal research has examined the importance of attachment for the parent. That the existing literature only focuses on the benefits of the parent – child relationship on children's stress, the current study will serve to expand the literature on 1) the relationship between parental attachment and parental stress, 2) examine the whether attachment is a predictor of the stress trajectory, 3) observe the stability of attachment over the course of the intervention, and 4) determine whether parental attachment serves as a protective factor of parental stress in parents of children with ASD. In order to determine whether attachment serves as a buffer against parental stress, we will analyze whether parental stress has an impact on parental attachment. By identifying the benefits of attachment, we aim to generate a more clear depiction of attachment as a protective factor for parental mental health. More specifically, we examined how attachment impacts the outcome of Mindfulness-Based Stress Reduction (MBSR), an empirically supported stress reduction intervention that has been established as efficacious in stress reduction in healthy individuals and in the treatment of both mental and physical disorders (Chiesa & Serretti, 2009). MBSR focuses on training individuals to pay attention to each moment in a non-judgmental way. MBSR has not yet been analyzed for reducing stress in a group of parents of children with ASD. However, a few studies have shown the benefits of mindfulness interventions for parents including one case study conducted by Singh and his associates in which 4 parents of children with developmental

disabilities were coached with mindfulness techniques to help cope with their everyday interactions. Each parent received individual sessions to show them how to implement mindfulness while communicating with their child (Singh et al., 2010). The MAPS intervention differs from previous studies because it utilizes an MBSR approach to analyze the indirect effect of mindfulness training on parent-child interactions. A recent study with the current sample was the first randomized control trial to examine the effectiveness of MBSR for parents of children with developmental delays (Neece, 2013). Preliminary analyses show that MBSR significantly reduced parenting stress for parents of children with developmental delays (Neece, 20013). Moreover, a secondary study with the current sample shows that there was a significant reduction in parental stress for parents of children. Given the current literature addressing parental mental health, we hypothesized that higher levels of parental feelings of attachment pre and post intervention would be negatively associated with parental stress.

Attachment as a Predictor of Parental Mental Health

As there is a lack of research addressing the association between parental attachment and parental stress, the current study utilized exploratory analyses to shed light on the potential relationship between these constructs. We investigated whether attachment would impact the trajectory of parental stress over the course of the stress-reduction intervention. We expected that parents who reported more feelings of closeness with their child would have lower levels of parental stress at the outset of the intervention. Additionally, we investigated whether attachment would predict where the parents start and the trajectory of parental stress across the eight-week intervention.

Examining the Stability of Parental Attachment

Given that there is a paucity of literature addressing the nature of parental attachment, we investigated whether parents' subjective experience of bonding with their child changes over the course of the stress reduction intervention.

Attachment as a Protective Factor of Parental Stress

We investigated whether attachment would moderate the outcome of MBSR. We wanted to examine whether there would be a difference in the benefits experienced by parents with higher or lower attachment over the course of the intervention.

Participants

The current study utilized data from the Mindful Awareness for Parenting Stress (MAPS) Project, which includes parents of children, ages 2.5 to 5 years old with ASD and developmental disorders. For the current study, only families of children with ASD were included. Subjects were primarily recruited through the Inland Empire Regional Center. Additional sources for recruitment included: the local newspaper, local elementary schools, and the local Autism Society. Families who met the inclusion criteria were selected by the Regional Center's computer databases and received a letter and brochure informing them of the study. Information about the study was also posted on a website which allowed interested parents to submit their information. An article was placed in the local newspaper and in the university's weekly newsletter in order to increase the number of people reached. Additionally, information sessions were held at local elementary schools and parent groups.

Criteria for inclusion in the study were: (1) Having a child ages 2.5 to 5, (2) receiving an ASD diagnosis from the Regional Center or an independent assessment, (3) parent(s) reported more than 10 child behavior problems (the recommended cutoff score for screening children for treatment for conduct problems) on the Eyberg Child Behavior Inventory (ECBI; Robinson, Eyberg, & Ross, 1980), (4) parent(s) was not receiving any form of psychological or behavioral treatment at the time of referral (e.g. counseling, parent training, parent support group, etc.) and did not have a history with mindfulness prior to the intervention, (5) parent(s) agreed to participate in the intervention (consent was given by signing the MAPS consent form), and (6) parent(s) spoke and understood English. Exclusion criteria included parents of children with debilitating physical disabilities or severe intellectual impairments that prevented the child from participating in the assessment tasks described in the protocol (e.g. child is not ambulatory). In order to be included, parents must also have completed all initial measures and attended the initial assessment before the beginning of the first intervention session. Of the 95 families that were screened for the study, 63 were determined to be eligible, and 51 parents enrolled in the study originally. Five parents completed the initial assessments but dropped out of the study before the intervention began leaving a final sample of 46 parents; however. This study was further restricted to families of children with ASD, which resulted in a total sample of 39 parents. The current study only utilized data from the parents of children with ASD. There were no demographic differences between participants who completed the intervention and those who dropped out of the study. Similarly, there were no demographic differences between families of children with ASD and those with other developmental disabilities.

Table 1 depicts the demographics of the current sample. Of the 39 parents participating in the current study, 19 attended the immediate treatment group, and 20 were part of the wait-list control group (see Table 1 for group differences). In the combined sample, 72.5% of the children were boys. Parents reported 32.5% of the children as Caucasian, 32.5% as Hispanic, 7.5% as Asian, 2.5% as African American, and 25.0% as "Other." The mean age of the children was 3.7 years with a standard deviation of .94. The majority of parents (76.8%) reported that their child's diagnosis was Autistic Disorder, and the remaining children were reported to have another diagnoses on the autism spectrum. Most parents were married (77.5%) and were mothers (70.0%). The mean age of the participating parent was 33.4 years with a standard deviation of 7.18. Families reported a range of annual income; 47.5% reported an annual income of more than $50,000 and incomes range from $0 to over $95,000. Parents completed an average of 14.55 years of school with a standard deviation of 2.69. According to the Gilliam Autism Rating Scale (GARS), 83.3% of the children had a "very likely" diagnosis of autism, while the remainder of the sample had a 16.7% "possible" diagnosis of autism. The two intervention groups did not significantly differ on any demographic variable assessed including child gender, child ethnicity, child age, parental age, education, marital status, or family income. The two intervention groups were collapsed for the current study, as the two groups did not differ significantly on any demographic variables and we did not include any analyses of comparison. Moreover, by combining the two groups, the larger sample size enabled us to have more statistical power.

Table 1

Demographic Characteristics of Participants by Treatment Group

	Immediate $N = 19$	Delayed $N = 20$	χ^2 or t
Children			
Gender (% boys)	69.20	77.80	.02
Mean Age in Years	3.44	4.08	1.89
Ethnicity (% Caucasian)	31.20	25.00	.00
Diagnosis (% Autistic Disorder)	75.00	83.30	.28
Participating Parent			
Mean Age in Years	33.60	35.70	.72
Marital Status (% Married)	84.20	75.00	.10
Education (Mean Grade in School)	15.00	14.30	-.87
Family Income (% > $50K)	57.90	40.00	.64

*$p < .05$

Materials and Methods

Interested parents contacted the MAPS project by phone, postcard, or by submitting their information on the project website. Study personnel then conducted a phone screen to determine the eligibility of the parent(s). If the parent met inclusion criteria, an initial laboratory assessment was scheduled. Prior to the initial assessment, parents were mailed a packet of questionnaires that was to be completed before arrival at the assessment.

The initial assessment took place in the MAPS lab in the Psychology Department at Loma Linda University. At this assessment, parents were given an informed consent that was explained by the study staff. After completing the informed consent and an interview to collect demographic information, the parents drew a piece of paper out of a

box which informed them whether they were assigned to the spring or summer intervention group. Parents assigned to the summer intervention group returned for a second pre-treatment assessment prior to the beginning of the intervention, in order to determine whether the treatment group differed from the control group subsequent to the intervention.

Parents assigned to the spring group began intervention in March and parents assigned to the summer intervention began the intervention in June. The Mindfulness Based Stress Reduction (MBSR) intervention follows the manual outlined by Dr. Jon Kabat-Zinn (Kabat-Zinn et al., 1992). This intervention consists of three main components: (1) didactical material covering the concept of mindfulness, the psychology and physiology of stress and anxiety, and ways in which mindfulness can be implemented in everyday life to facilitate more adaptive responses to challenges and distress, (2) mindfulness exercises completed both during the group meetings and as homework between sessions, and (3) discussion and sharing in pairs and in the larger group. The MBSR program includes eight weekly 2-hour sessions, a daylong meditation retreat after the sixth session, and daily home practice based on audio CDs with instruction. Formal mindfulness exercises include the body scan, sitting meditation with awareness of breath, and mindful movement. MBSR is an empirically supported secular (non-religious) based intervention that has been used with a wide range of people (Chiesa & Serretti, 2009).

After completing the group, parents from the spring intervention participated in a post-treatment assessment and completed the PSI again. At this time, the parents assigned to the summer group returned to the lab for the same assessment as part of a wait-list control design. After the completion of the project (all assessments have been conducted) parents will receive a short summary of their child's current and previous

behavioral functioning in order to reinforce parents' efforts to improve their parenting skills as well as raise awareness for remaining concerns.

Scales of Measurement

Gilliam Autism Rating Scale (GARS – 2; Gilliam, 2006) is a 42 – item scale designed to for clinicians to identify a diagnosis and severity of autism in individuals aged 3 to 22. The scale measures this through three subscales: stereotyped behaviors, communication, and social interaction. If the participant's Autism Index is an 85 or above, the child is "very likely" to have ASD, and if the child's score is 70 – 84, they are given a "possible" diagnosis of autism. If the child's scores on the Autism Index is 69 or less, it is assumed that the child is "very likely" to have autism. For the purposes of this study, we examined the likelihood that children in the sample had a diagnosis of Autism Spectrum Disorders, in order to generate a more accurate depiction of the range of developmental delays in the sample.

The Parenting Relationship Questionnaire (PRQ; Kamphaus & Reynolds, 2006) is a 45 – item scale designed to assess the relationship between the primary caregiver and his or her child. The scale measures this construct through seven subscales consisting of: attachment, communication, discipline practices, involvement, parenting confidence, satisfaction with school services, and relational frustration. For the purposes of this study, we looked at the attachment subscale, which defines attachment as "empathy, closeness, and understanding" (PRQ; Kamphaus & Reynolds, 2006). Parents respond to the questions on the PRQ in a Likert type scale with Never (1) to Almost Always (4) (PRQ; Kamphaus & Reynolds, 2006). High test-retest reliability has been demonstrated for the attachment subscale (r = .78). Additionally, internal consistency for the scale has been

determined. For the parents of children between the ages of 3-5, alphas were both .83 for females and males (PRQ; Kamphaus & Reynolds, 2006).

Parenting Stress Index – Short Form is a 36 – item questionnaire designed to measure the extent to which parents are experiencing stress. Participants responded to the measure on a five point Likert Scale ranging from Strongly Agree (1) to Strongly Disagree (5). The PSI-SF contains three subscales assessing stress in three domains: Parent-Child Dysfunctional Interaction, Difficult Child, and Parental Distress. For the purposes of the current study, we analyzed the Total Stress score. This measure has high validity and good internal consistency (Reitman, Currier, & Stickle, 2002) and cronbach's alpha reliabilities for the total stress score is high (α = .91) (Allison, Barnes, & Oehler, 2010). More specific to the current study, the validity and construct validity has been shown to be high for studies conducted with toddlers (Whiteside-Mansell et al., 2007).

The Subjective Units of Distress Scale (SUDS) (adapted from Singh et al., 2007) is a 1-item scale that measures participants' subjective experience with stress in the last week. Parents were asked, "On a scale of 0 – 10, how stressed do you feel?", "On a scale of 0 to 10, how well do you feel that you can cope with your stress?", "On a scale of 0 to 10, how satisfied are you with your parenting skills?" and "On a scale of 0 to 10, how satisfied are you with your relationship to your child", where a 0 represented no stress at all and a 10 represented extreme levels of stress. This measure was collected at the beginning of each group resulting in a total of 9 SUDS ratings (8 weekly groups and a daylong retreat) for each participant. It was adapted from the Measure of Subjective Units of Parenting Satisfaction (SUPS) used by Singh and colleagues (2007), which includes a

subjective measure of parental interaction satisfaction and parents' reports of using mindfulness in between sessions.

General Analysis Strategies

All data was analyzed for the assumptions of normality and the presence of outliers. The analytic framework for the current study consisted of correlations, hierarchical linear modeling, independent samples t-tests, and hierarchical linear regression. To address the first research question, Pearson's r correlations were conducted to analyze the relationship between parental feelings of attachment and parental stress at intake and post intervention.

To address the second research question, hierarchical linear modeling was used to examine changes in parental stress across the course of the intervention (HLM 7; Raudenbush & Bryk, 2002). HLM analysis was used to examine (a) whether there was a significant change in parenting stress over the course of the intervention, and (b) to determine whether attachment moderated the trajectory of parental stress over the course of the MBSR intervention.

To examine significant change over time in each group, we first examined the best model of rate of change. A linear slope term was first added to the model and then quadratic and cubic terms were added in a stepwise hierarchical fashion to examine whether they significantly improved the fit of the model (i.e., deviance parameter). The best-fit model included only the intercept (representing the dependent variable at Time 1) and linear slope representing the linear rate of change of the dependent variable across the intervention. As discussed in Measures, the SUDS was administered to participants at each group session and the day-long retreat resulting in a total of 9 data points that were

used to model the variable trajectories across the MBSR group. The variable representing time ranged from 0 – 8, because there were 9 weekly time points. To examine whether attachment moderated changes in stress over the course of the intervention, parental attachment was added as a level – 2 predictor. A significant finding would indicate that trajectories of parental stress change as a function of parental attachment. As no demographic variables were correlated to the independent and dependent variables, the conditional models did not include demographic covariates.

To analyze the third research question, a paired sample t –test was used to examine parents' feelings of attachment pre and post intervention. For the final research question, a hierarchical linear regression analysis was used to examine attachment as a moderator in the stress reduction intervention outcomes form pre to post treatment. As there were no relevant demographic covariates to be entered, the first step included the pre-treatment scores on the PSI-SF. The post-treatment scores on the PSI-SF were entered in the third step. The moderating variable, attachment, was entered on the fourth step. The final step included the attachment and parenting stress interaction term.

CHAPTER FOUR

RESULTS

Hypothesis 1: Parental Feelings of Attachment and Parental Stress

We hypothesized that higher levels of attachment would be negatively associated with parental stress, such that parents who reported higher levels of attachment would experience less parental stress. Pearson's r correlations were conducted in order to examine the relationship between parental stress and parental attachment both at the beginning and conclusion of the intervention. Contrary to our hypothesis, we found that pre-treatment parental stress and pre-treatment attachment were not related (r = - .405, *p* = .08), although it does seem to trend towards significance. Additionally, post-treatment parental stress was not correlated with post-treatment parental attachment (r = - .261, *p* = .28). It is interesting to note, however, that there was a significant relationship between pre-treatment parental stress and post-treatment attachment (r = .48, *p* = .006).

Hypothesis 2: Trajectories of Parental Stress

We examined whether attachment would impact the trajectory of parental stress over the course of the stress-reduction intervention. Multilevel Growth Model Analyses were conducted in order to analyze the trajectory of parental stress over the course of nine time points. The primary distribution of parental stress was examined at each time point. Table 2 shows the results of the unconditional growth model. The model indicated that there was a significant decrease over time in parent's reports of their overall stress. At the first session, the mean SUDS rating for parent's overall stress was 7.19 (out of 10)

which significantly decreased over the 8-week treatment (see Figure 1) by about a half point each week (β = -.42, p <.001) resulting in a final mean of 3.41 (out of 10).

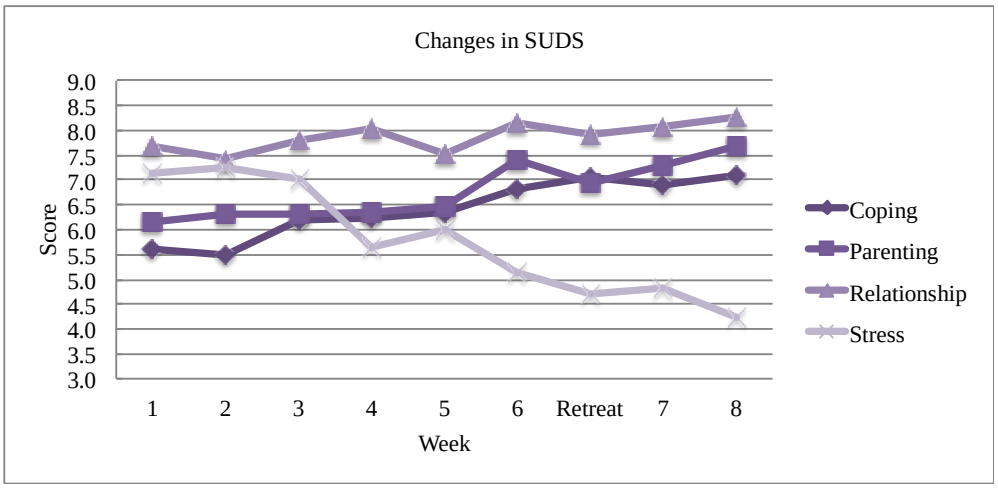

Figure 1. Trajectories of SUDS variables across the intervention.

Parental attachment was added to the model as a level-2 predictor. The results of the conditional model are displayed in Table 2. The model indicated that parental attachment did not significantly predict the level of initial stress parents reported prior to the intervention. Parents who had higher attachment with their children did not report being less stressed than those whose reported lower levels of attachment at the outset of the intervention (β = .06, p = .30), indicating that the rate of change for parental reductions in stress did not differ based on attachment. Over the course of the intervention, the trajectory of parental stress did not change as a function of the parents' attachment level (β = - .001, p >.10).

Table 2

Results of Multilevel Models

Variable	Stress	Ability to cope	Parenting Skills	Relationship
Unconditional				
g_{oo}	7.19 (.28)***	5.82 (.30)***	6.01 (.26)***	7.55 (.27)
g_{10}	- 0.42 (.05)***	0.19 (.05)***	0.19 (.03)***	0.11 (.03)***
d_o	1.73***	2.23***	1.81***	2.28***
d_1	0.04	0.03*	0.00	0.01*
Conditional				
g_{oo}	7.19 (.28)***	5.81 (.28)***	6.01 (.24)***	7.55 (.25)***
g_{01}	0.06 (.06)	0.14 (.05)**	0.12 (.05)*	0.15 (.05)
g_{10}	-0.42***		0.19***	0.11***
g_{11}	-0.00		-0.00	-0.01**

* p <.05, ** p <.01, *** p < .001

Note. Intercept and slope parameters are presented with standard error in parentheses

Hypothesis 3: Stability of Parental Attachment

We aimed to examine the stability of parental attachment across the course of the intervention. A paired samples t – test indicated that parental attachment at Time 1 (M = 21.11, SD = 4.27) and parental attachment at Time 2 (M = 21.26, SD = 4.62; t = - .17, p = .87) were not significantly different, indicating that parental attachment was stable from pre to post intervention.

Hypothesis 4: Attachment as a Moderator of Parental Stress

We examined whether attachment would serve as a moderator for stress reduction across the intervention. Hierarchical Linear Regression analyses suggest that attachment does not moderate the reduction in stress across the intervention, (R^2 = .026, $F_{1,23}$ = .615, p = .441). See Table 3.

Table 3

Results of Hierarchical Linear Regression

Variable	**β**	**R^2**	**df**
Stress x Attachment	.03	0.26	1, 23

Note. Total $F_{1, 23}$ = .614,*p < .05, ** p < .01, ***p < .001

The APA Publication Manual, 6th edition, is focused only on the formatting of papers for submission to scholarly journals, and there are no guidelines for theses or dissertations. In order to make a better fit for a publication such as a dissertation, we have modified the headings. The following table summarizes the heading styles required for your dissertation.

Post-Hoc Analyses

As the current study aimed to explore the relationship between parental stress and parental attachment towards their child with ASD, a number of additional analyses were conducted. In order to gain a better depiction of parental stressors within the parent-child relationship on a weekly basis, post-hoc analyses were conducted to analyze parental

satisfaction with the parent-child relationship and parental satisfaction with their own parenting skills. Additionally, while the longitudinal measure of parental stress (SUDS) indicated that parents experienced significant reductions in stress, the investigators wanted to generate a more accurate representation of the parents' subjective experience with stress. In order to do this, a post-hoc analysis was conducted addressing parents' ability to cope with stress over the course of the intervention. This measure was intended to analyze whether the parents in the study simply experienced a reduction in stress, or whether they had also gained coping skills for dealing with stress that could be utilized after the culmination of the intervention. Similar procedures were used to conduct HLM analyses examining changes in parents' ability to cope with stress, parents' satisfaction with the parent-child relationship, and parents' satisfaction with their parenting skills.

Parental Attachment as a Moderator of Parents' Ability to Cope with Stress

The primary distribution of satisfaction with one's parenting skills was examined with the SUDs measure. Multilevel Growth Model Analyses were conducted to analyze the trajectory of parents' ability to cope with stress over the course of the intervention. Table 2 shows the results of the Unconditional Growth Model. The results of this model indicated that at intake parents reported a mean score of 5.82 ability to cope with stress (out of 10) which significantly increased on average by .19 points per session ($\beta = .19$), $p < .001$), resulting in a final mean score of 7.53.

Parental attachment was added to the model as a level-2 predictor. The results of running the conditional model are displayed in Table 2. The results indicated that parental attachment significantly predicted the initial level of coping skills parents reported prior

to the intervention. Parents who had higher attachment with their children reported being better able to cope with stress than those whose reported lower levels of attachment (β = .14, p < .01). Parental attachment predicted the trajectory of parent's ability to cope with stress such that parents with higher attachment improved less over the course of the intervention (β = -. 02, p = .01). See Figure 2 and Table 2.

Attachment as a Moderator of Relational Satisfaction

Table 2 shows the results of the Unconditional Growth Model. The model indicated that the mean SUDS rating for parental satisfaction at the first session was 7.55 (out of 10), which significantly increased by .11 points per session (β = .11, p = < .001) resulting in a mean of 8.54 (out of 10) at the final session. See Figure 1. Parental attachment was added to the model as a level-2 predictor. The results indicated that parental attachment significantly predicted the level of initial satisfaction parents reported prior to the intervention. Parents who had higher attachment with their children reported being more satisfied with their relationship than those who reported lower levels of attachment (β = .15, p < .005) at the initial intake. Over the course of intervention, the trajectory of parental satisfaction indicates that more attached parents experienced fewer increases in satisfaction across the intervention (β = - .01, p < .01), suggesting that the intervention was more efficacious for parents with less attachment to their children. See Table 2 and Figure 2.

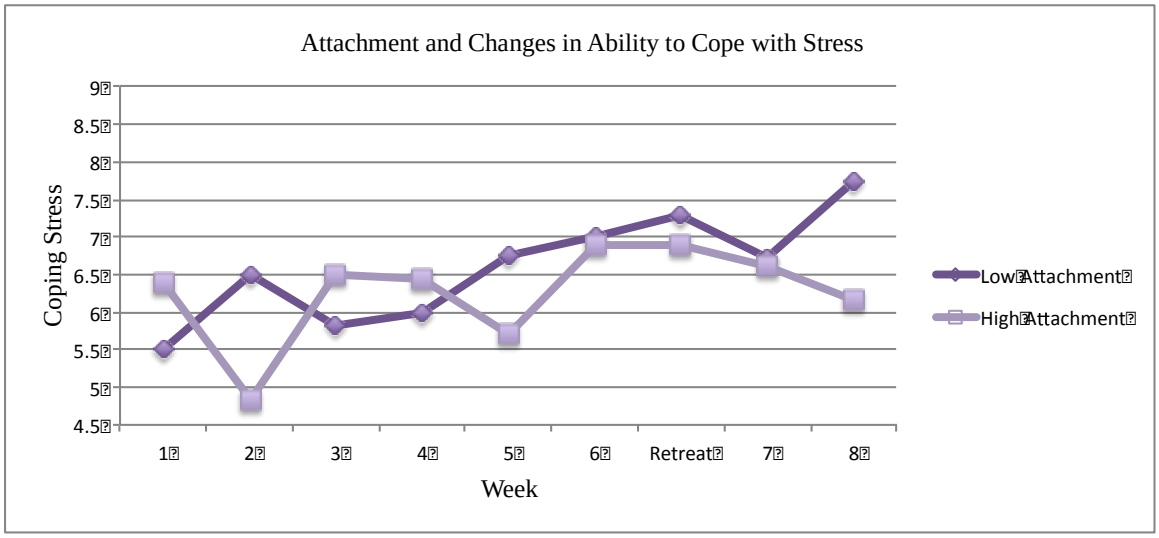

Figure 2. Trajectories of parents' ability to cope with stress for higher and lower attached parents.

Attachment as a Moderator of Parenting Skills Satisfaction

Table 2 also shows the results of the Unconditional Growth Model. The model indicates that the mean SUDS rating for parental satisfaction at the first session was 6.01 (out of 10), which significantly increased by .19 points per session ($\beta = .19$, $p < .001$) resulting in a mean of 7.79 (out of 10) at the final session.

Parental attachment was added to the model as a level-2 predictor. The results indicated that parental attachment marginally predicted the level of initial stress parents reported prior to the intervention. Similar to findings examining satisfaction with the parent-child relationship, parents who had higher attachment with their children reported being more satisfied with their parenting skills than those whose reported lower levels of attachment ($\beta = .12$, $p < .05$) at the initial intake. Over the course of intervention, parental attachment did not predict the trajectory of parental satisfaction ($\beta = -.003$, $p = .67$). See Table 2.

CHAPTER FIVE

DISCUSSION

Statistical Power

Statistical power is dependent on the sample design, sample size, and the statistical analysis. According to power calculations (using G*Power, Faul, Erdfelder, Bychner & Lang, 2009), in order to have an 80% chance of detecting an effect, a sample size of 29 was needed to detect a large effect size ($f^2 = .35$). Post-hoc power analysis for the current study reveal that we had 52.85% power to detect a large effect size ($f^2 = .25$), 34.2% power for a medium effect size ($f^2 = .15$), and 8.2% power to detect a small effect size ($f^2 = .02$).

Summary of Findings

Parents of children with ASD were asked to report on their parental experience of stress and attachment. Over the course of the intervention, parents' subjective feelings of stress decreased significantly. Moreover, parents' experienced significant increases in their ability to cope with stress, satisfaction with the parent – child relationship, and in their satisfaction with their own parenting skills. As little is known about the stability of parental attachment, the current study examined the nature of parents' attachment to their child. The results indicated that parental attachment did not change from pre to post intervention, suggesting this is a rather stable construct and is less impacted by mindfulness training. With regards to attachment as a moderator of changes in parental mental health, parental attachment predicted the initial levels of parents' relational satisfaction, parenting skills satisfaction, and their ability to cope with stress. Over the

course of the intervention, parents' attachment to their child moderated the trajectories of the changes in relationship satisfaction and in parents' ability to cope with stress.

Mindfulness and Stress

The practice of mindfulness, as presented by Jon Kabat-Zinn, is intended not to change parents' external stressors, but rather to prepare them to accept them as part of daily living (Kabat-Zinn et al., 1992). Parents of children with ASD are faced with stressors that many other parents never have to endure (Eisenhower, Baker, & Blacher, 2005; Estes et al., 2009; Jang, Dixon, Tarbox, & Granpeesheh, 2011; Kozlowski & Matson, 2012). These stressors (e.g., child behavior problems, child's speech development) impact parents' mental health and can ultimately affect their quality of life. The practice of mindfulness encourages the individual to be continuously present with whatever they are currently experiencing. By adhering to these principles, parents' are given new tools for mentally coping with their daily stressors. They are taught to consciously direct their attention towards whatever they are facing. By utilizing this practice, parents regain control over their own experience of stress. Rather than immediately acting upon their stress (e.g., yelling at their child, watching t.v.) they are encouraged to process the moment in a different way, ultimately enabling them to live in the present rather than exerting all their mental energy on worries about the past or future (Kabat-Zinn, 1990). While the main emphasis of the MAPS study was to determine whether parents experienced decreases in stress, the findings suggest that they also gained skills for dealing with their daily stressors that can continued to be used subsequent the conclusion of the intervention.

Parental Stress and Attachment to their Child

We explored the relationship between parents' attachment bond and their parental stress. We expected that higher attached parents would report lower levels of stress at the outset of the study. Although the results were not significant, there was a marginal association between pre-intervention stress and parental attachment at the intake session. Moreover, post-hoc power analyses indicate there was a 74.3% chance of detecting an effect of this size given the sample size of the present study.

The findings from the current study suggest that a parent's relationship with their child, did not enhance the effects of mindfulness on parents' decrease in stress over the course of the intervention. While the attachment bond may have served as a protective factor against stress at intake, its protective properties did not seem to carry over into the trajectory of changes in parents stress levels over the course of the intervention. This discrepancy may be explained by the two measures of parental stress. The analyses conducted using the Parenting Stress Index, suggests that there was a marginal relationship between parental stress and parental attachment at the beginning intake session, such that parents with higher attachment were experiencing less stress in the parental domain. At the conclusion of the intervention, there was a significant relationship between parents' pre-intervention levels of stress and their post- intervention levels of attachment.

When parental stress was measured using SUDS, the results suggest that parents' level of attachment was not associated with their stress, such that parents with higher attachment were equally stressed to those parents reporting lower attachment. The item by which it was measured may in part account for this finding. The SUDS item asked " On a scale of 1 to 10, how stressed do you feel?". This question prompts parents to

indicate how much stress they are feeling in all areas of their life. By this measure, a parent will report on the stress they experience in their job, finances, house, marriage, family, friendships, and in any other area they may experience during the week. While this report is representative of their overall stress level, it does not directly refer to the parents' stress derived from the parent child relationship. As the current study aimed to investigate the relationship between parental attachment and parental stress, it is important to analyze parents' stress within the context of parenting and the parent-child relationship.

Furthermore, the discrepancies reported in the results from the Parenting Stress Index and the SUDS may also be interpreted not only in light of the aspect of stress measured, but also in terms of the psychometric quality and the difference at time measured. While the SUDS measure provided the investigators with a weekly measure of the parents' subjective stress levels, the construct was analyzed from a single question, whereas the PSI consists of 36 items, which have been shown to be highly reliable. Moreover, the relationship between parental stress and parental attachment may have been more evident during the intake interview as the parents were not currently receiving any source of psychological intervention. At the weekly meetings, the difference in parental stress between the higher and lower attached parents may have been less evident as they were simultaneously receiving training in stress reduction techniques.

While our results suggest that parents' level of attachment did not moderate the reduction in stress, it is important to note, however, there was a marginal relationship between parental stress and parental attachment at the outset of the intervention. While the level of parental attachment did not impact the amount of stress reduction parents experienced over the course of the intervention, higher attachment did better prepare

these parents to cope with stress. These results may be accounted for by the time measurement of attachment. As attachment was only measured at two time points, parental attachment and parental stress could not be analyzed concurrently, ultimately limiting our understanding of how the two constructs change together. By measuring attachment at each session we would be able to determine whether attachment remained stable across the intervention or if there were fluctuations from week to week. Moreover, we might be able to determine if attachment fluctuated with the decrease in stress experienced by parents on a weekly basis.

Stability of Attachment

While parents experienced significant reductions in stress on average, the stability of attachment may indicate that neither the practice of mindfulness nor stress reduction impacts parents' attachment towards their children. Moreover, the construct for attachment was the only variable in the current study that remained stable. One implication is that parental attachment is stable and less impacted by parental stress. It is also plausible that attachment is not impacted by mindfulness training. In light of mindfulness research, we would expect that training in feelings of compassion, empathy and attunement to oneself and others would enable a parent to experience greater feelings of attachment for their child. When interpreting these results, it is important to understand that the stability of attachment may in part be accounted for by the attachment items on the parenting relationship questionnaire.The PRQ contains items addressing parents' abilities to read their child's mood and to know what their child is thinking. Given that the children in the current sample have an autism spectrum disorder, parents likely struggle to interpret their child's thoughts and moods. While mindfulness training helps

parents to become more mindful and compassionate towards their child, the practice of MBSR is not created to help parents interpret their children's thoughts and behaviors. It is necessary to consider the measure of attachment when interpreting the results. The current study only included attachment measures at pre and post treatment. As the concept of parental attachment is not common in attachment literature, further research is needed to gain a more full depiction of parent's bonding with their children. Moreover, the Parenting Relationship Questionnaire (PRQ, 2006) defines parental attachment as a parent's level of "empathy, closeness, and understanding" towards their child. While these three attributes are part of parental attachment, the definition restricts the concept of attachment to encapsulate only these three aspects of the parent-child relationship. With regards to the reliability and validity of the measure, certain issues need to be addressed. In terms of reliability, the reliability coefficients have been shown to be higher for parents with older children rather than for younger children (Rubinic & Schwickrath, 2010). As the current study only consisted of children between the ages of two and five, the high reliability reported by the publishers would not pertain to our sample. In terms of validity, Kamphaus and Reynolds may have "overstated" the validity evidence for their measure (Rubinic & Scwickrath, 2010). When the PRQ was tested against comparison instruments - Parrent-Child Relationship Inventory (PCRI), Parengint Stress Index (PSI_, and Stress Index for Parents of Adolescents (SIPA), the correlations were moderate. More specifically, the correlation between the attachment measure between the PRQ and PCRI was moderate (.57) (Ruinic & Scwickrath, 2010). In light of the psychometric quality of the measure with regards to its use in the current study, the PRQ may not have been the most accurate measure of the construct of parental attachment. However, given that there remains a lack of literature addressing parental attachment

towards their child, the measure provided the current study with a means of observing the parents' subjective reports of the parent-child relationship.

Future studies should track the trajectory of attachment alongside the trajectory of parental stress in order to determine how they interact longitudinally. An extra question on the SUDS addressing parental stress directly related to the parent-child relationship would provide future research with a more clear understanding of the relationship between parental attachment and stress. Moreover, post-hoc power analyses indicate that null findings may be due to the lack of statistical power, given that there was only a 13.9% chance of detecting an effect of this size.

Post-Hoc Analyses

Post-hoc analyses addressing parental mental health indicated that attachment was related to the initial levels of parents' ability to cope with their stress, parents' relationship satisfaction, and in satisfaction with parenting skills. Consistent with the research, at the outset of the intervention, parents with higher attachment exhibited more gains in these areas of parental mental health (Willinger, Diendorfer-Radner, Willnauer, Jörgl, & Hager, 2005). Over the course of the intervention, attachment moderated the trajectories of parents' ability to cope with stress and parents' satisfaction with the parent-child relationship. With regards to parents' ability to cope with stress, it is notable that lower attached parents on average were better able to cope with stress than those with higher attachment. These results suggest that parents with lower attachment may benefit more from the psychological resources gained through mindfulness. In this way, learning to be more attuned to their emotions and less reactive in response to negative

events, may have helped the lower attached parents to cope with outward stressors in a more constructive way.

With regards to parents' satisfaction with their parenting skills, attachment moderated the increase in parental satisfaction with higher attached parents experiencing fewer gains over the course of the study. These findings may suggest that while having lower attachment does not make a parent more susceptible to stress, it can negatively impact the perception of the relationship they have with their child. The gains experienced by those parents with lower attachment may be accounted for by the mindfulness practice of loving kindness. This practice encourages the individual to express warmth, compassion, and appreciative joy not only for themselves, but for others. It may be that by practicing acceptance of and appreciativeness for others, parents with lower attachment learned how to be more empathetic, compassionate, and understanding of their children. As these skills are included in the definition of attachment used by the current study, it may be that parents with lower attachment learned skills already practiced by those with higher attachment towards their children. By practicing skills of appreciation and warmth, the parents likely were able to find and focus on aspects of the parent child relationship for which they were grateful and from which they derived some satisfaction.

While attachment did not moderate the trajectory of changes in parents' satisfaction with their parenting skills, it may be that parents with higher satisfaction, were initially more satisfied with their own parenting skills as an outcome of their satisfaction with the parent-child relationship. Over the course of the intervention, however, as those parents with lower attachment experienced increases in relational satisfaction and in their own ability to deal with their stress, these differences

disappeared. This may be accounted for by the fact that a parent who does not feel bonded towards their child and is incapable of coping with daily stressors may perceive the difficulties in the parent-child relationship as being a consequence of their parenting skills. As these parents experienced positive psychological resources over the course of the intervention and learned to treat themselves with appreciation and respect, they may have come to find a new satisfaction for their own parenting abilities. Moreover, from a statistical standpoint, post-hoc power analyses indicate that null findings may be due to the lack of statistical power, given that there was only a 10.0 % chance of detecting an effect of this size.

Limitations

The findings of the current study must be considered within the context of several limitations. As the project was part of a pilot study, the first limitation is a fairly small sample size. Given a larger sample size, we would have had more statistical power to detect small effect sizes. Lastly, as the current study did not include a control group, normal changes over time cannot be accounted for with regards to pre-treatment and post-treatment changes in stress, coping skills, and relational and parenting skills satisfaction.

Future Directions

Future directions for this line of research include replicating this project with a larger sample size and including a control group for comparison, which will serve to validate the results of the current project and enable us to detect natural changes in stress and in the parental satisfaction variables over time. Additionally, future studies should

measure attachment longitudinally, in order to compare the changes in parental stress on the same measure. While attachment was stable, parents' subjective satisfaction with the parent – child relationship improved over the course of the intervention. It would be helpful to ask parents what parts of the relationship give them satisfaction in order to better tailor future interventions to parents' needs. Moreover, as the attachment bond is bidirectional, future studies should consider the use of the Strange Situation to determine how child attachment relates to the stability of parental attachment over the course of the intervention. As mindfulness seems to be related to improved parental satisfaction, loving kindness exercises could be personalized to the areas of the parent-child relationship which typically are most stressful for the parent.

Conclusion

Given the interaction between parental attachment and parental mental health, parental attachment may be an important target in future parental stress-reduction interventions. The findings from the current study suggest that parents with lower attachment are more at risk for poor mental health, both within the parent-child relationship and in their ability to cope with their stress. As such, future interventions should assess parents' attachment at the outset of the intervention, and special attention should be delegated to these individuals as they have the capability of taking the most away from the intervention.

While attachment was stable over the course of the intervention, the benefits experienced in the areas of coping skills, relational satisfaction, parenting skills satisfaction, and parental stress suggest that MBSR is efficacious in improving parental mental health both individually and within the parent-child relationship. As parents of

children with ASD suffer from high levels of stress, mainly of a function of the child's behavior problems, it is imperative that future studies address gains that can be made within the parent-child relationship and in the parent's relational satisfaction.

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