

Transactions between Child Behavior and Parent Anxiety/Depression in Children with Autism Spectrum Disorders: The Roles of Parenting Stress, Self-Efficacy and Emotion Coaching

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By

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ABSTRACT

Parents of children and adolescents with Autism Spectrum Disorders (ASD) have been shown to experience increases in stress, depression, and anxiety, which are also associated with child behavior problems related to ASD, such as aggressive behaviors and tantrums. Literature examining potential mechanisms that underlie the relationship of child behavior problems and parental anxiety/depression are scarce. The current study seeks to examine the roles of parental stress, parent self-efficacy, and emotion coaching as mediators between child behavior problems and parental anxiety/depression. Using a sample of 134 mothers who completed an online survey, these potential mediators were tested with regression analyses. Parental self-efficacy was found to mediate parental stress and parental depression/anxiety. Parental self-efficacy was also found to moderate child conduct problems and parental emotion coaching. There was a positive relationship between conduct problems and emotion coaching for mothers with high self-efficacy. Implications and future research will be discussed.

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## **Chapter 1**

### **Introduction**

Autism Spectrum Disorders (ASD) are lifelong neurodevelopmental disabilities that begin in infancy and impair communication, social interactions, and creative behaviors. Recent estimates of the prevalence of autism suggest that the disorder is increasing, with as many as 1 in 150 children diagnosed with an ASD in the United States (Center for Disease Control, 2007). According to these reports, as of 2004, approximately 300,000 children aged 4-17 had been diagnosed with autism and were reported by their parents as having moderate to severe social, behavioral and emotional difficulties. With the incidence of ASD on the rise, it becomes vital that we understand how these disorders affect the parent-child relationship, which in turn could impact parent emotions and/or child behavior.

In particular, parenting a child with ASD encompasses various stressors on the family and the parent. Several factors work in concert to increase stress in parents of children with ASD. First and foremost, the realization that there is no cure for the disorder may serve to increase parental stress (Liwig, 1989). Factors related to the expression of symptomatology in the child may also serve to increase parental stress. For example, the socially inappropriate and aggressive behaviors typically associated with ASD have been found to be associated with increases in parental stress (DeMeyer, 1979; Harris, 1984). Parents may also be confronted by antipathy for their child's behaviors (Koegal et al., 1992) due to a lack of understanding of ASD (Wolf, Noh, & Fisman, 1989). Additionally, raising a child with ASD typically encompasses allocating extra time to meet the needs of the child (Holroyd, Brown, Wikler & Simmons, 1975). In a survey of mothers of children with special needs, for example, one-fifth of the surveyed mothers spent at least twenty hours a week involved in their child's home health care needs (Leitre, Krauss, Anderson, & Wells, 2004). This study indicated that more than half of these mothers had to end their employment to care for their children and half of the mothers who were still employed had

to decrease their hours at work. These findings suggest that multiple changes occur in the parental role to accommodate the challenges encompassed in raising a child with ASD. While examining such changes is helpful in increasing our understanding of parental stressors, examining the interplay of both parental and child factors as they contribute to the parent-child relationship (in terms of parental emotions and child behavior problems) will provide a greater understanding of the types of support and potential interventions needed by families of children with ASD.

### **1.1 Autism Spectrum Disorders and Parental Depression/Anxiety**

Much of the prior research has focused on parental stressors related to raising a child with ASD and has indicated a relationship between parental anxiety/depression and the behavior of children with a pervasive developmental disorder, including Autistic Disorder, Asperger's Disorder, and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS). In particular, this research suggests that mothers of children with autism report more depressive symptoms than fathers (Hastings et al., 2005b). Fathers, however, are found to have more depressive symptoms than controls, but less depressive symptoms than mothers (Olsson and Hwang, 2001). In fact, the lifetime prevalence of major depressive disorder may be higher in the parents of children with autism (Piven et al., 1991). Furthermore, mothers of youth with ASD also report experiencing excessive anxiety (Brewer-Johnson, 2005). In another study, nearly half of the parents of youth with ASD were found to be severely anxious and nearly two-thirds were found to be clinically depressed (Bitsika & Sharpley, 2004). Similar findings indicate that the amount of stress in parents of children with developmental disabilities was strongly related to increases in their depressive symptoms and to decreases in their psychological well-being (Gowen et al., 1989; Walker et al., 1989; Feldman et al., 2000; Abbeduto et al., 2004).

Child behavioral problems in particular, and not the severity of the disorder, have been found to contribute to maternal depressive symptoms; additionally, a child's lack of prosocial behaviors contributes to maternal stress (Beck, Daley, Hastings, & Stevenson, 2004). Beck et al. (2004) theorize that pro-social behavior may predict positive parental perceptions and that increases in children's pro-social behaviors may help to decrease parental stress (Beck et al., 2004). Other studies indicate that behavior problems in youth with ASD also predict the level of maternal anxiety and stress experienced (Hastings, 2003; Hastings et al., 2005a), as well as maternal mood disorders and depression (Benson, 2006; Gray & Holden, 1992; Ireys & Silver 1996; Sanders & Morgan, 1997). These findings suggest that the child's behavioral problems produce negative effects on the parents' psychological well-being. While the relationship between child behavior problems and negative parental psychological well-being has been established within the current literature, literature examining the mechanisms underlying this relationship is scarce.

These studies suggest that increases in stressors related to child behavior problems (e.g., harm to oneself or others, destruction of property and destructive behaviors) can produce an environment more conducive to parental anxiety/depression. In support of a bi-directional relationship, Baker, McIntyre and Blacher (2003) found that parental stressors and child behavior problems work in concert to instigate each other. They found a transactional model in which behavior problems resulted in high parental stress and high parental stress resulted in increased behavior problems.

## **1.2 Parental Self-Efficacy**

Prior research suggests that parental factors may influence the relationship between child behavior problems and parental stress and depression, including the role of parental self-efficacy within the parenting experience. Pakenham, Sofronoff and Samios (2004) examined the role of

self-efficacy within the parental coping process of adjusting to their child's ASD diagnosis. They found that parents who were better able to adjust and cope with their child's ASD diagnosis had higher self-efficacy. Other studies found that self-efficacy is negatively associated with parental psychopathology (Coleman & Karraker, 1998; Jackson & Huang, 2000). Kuhn and Carter (2006) examined the association between maternal self-efficacy and parental cognitions and found that maternal depression, stress, and guilt all accounted for unique variance in self-efficacy. Mothers who reported higher levels of self-efficacy were also more active in promoting the development of their children, suggesting that self-efficacy may also play a role in parenting behaviors.

Current research suggests that parental self-efficacy may underlie the relationship between child behavior problems and maternal anxiety/depression. Hastings and Brown (2002) found that self-efficacy mediated the effects of child behavior problems on the mother's anxiety and depression. This relationship was not the same for fathers. Instead, self-efficacy moderated the effect of child behavior problems on the father's anxiety. The differences in the effects of self-efficacy for fathers and mothers may be best explained by their differing parental roles. Another study found that mothers who felt more guilt about their child's condition were found to have lower maternal self-efficacy (Kuhn & Carter, 2006). Furthermore, mothers of children with autism report both increases in parental stress and decreases in parental competency (Fisman & Wolf, 1991; Rodrigue, Morgan & Geffken, 1990). Given that mothers of children with ASD experience higher levels of stress as compared to mothers of typical children (Woolfson & Grant, 2005), their increases in parental stress may reduce parental self-efficacy which might lead to increases in maternal anxiety/depression. Furthermore, although some literature has found self-efficacy to mediate the relationship between child behavioral problems and maternal anxiety/depression, the role of parental self-efficacy in relation to other parental variables (e.g., parental stress) has not been fully examined.

### 1.3 The Role of Parenting

Other parental variables may underlie the relationship of parental anxiety/depression and child behavioral problems. For example, ineffective parenting styles have been associated with increases in parental stress levels. Specifically, parents of younger children with developmental disabilities used authoritative parenting styles (i.e., responsive parenting style that emphasizes the child as an individual) more often than parents of younger typically developing children and these parents were found to have higher levels of stress (Woolfson & Grant, 2006). The authors theorized that this relationship was due to the ineffectiveness of authoritative parenting for children with developmental disabilities.

One way that parenting may be ineffective and negatively influence child behavior involves emotion coaching, which refers to the parent's awareness of their own emotions and their child's emotions and the way that parents address emotions that their child expresses (e.g., emotion coaching versus emotionally dismissive) (Gottman, Katz & Hoovan, 1996; 1997). Gottman et al. (1996; 1997) have also shown that parents who exhibit a tendency towards emotion coaching are more aware of their child's emotions, listen empathetically to their child, validate their child's emotions, recognize their child's emotion as a teachable moment, and help their child to identify appropriate ways to deal with an upsetting issue or problem. Children who are emotion coached are better able to regulate their emotions, are better at focusing their attention, have better friendships and are more emotionally intelligent. These studies suggest that the role of emotion coaching may be an important factor underlying the relationship between child behavior problems and parental anxiety/depression. Specifically, parents who exhibit emotion coaching styles may help teach their child how to regulate their emotions, which may result in fewer child behavior problems. Denham, Mitchell-Copeland, Strandberg, Auerbach and Blair (2004) also found that parents who exhibited more emotion coaching had children who

were better able to understand emotions in others. Additionally, they found that parents who were more affectively negative had children who were less socially competent. This finding suggests a relationship between negative expressed emotion and an emotionally dismissive parenting style.

Research suggests that negative emotional expression in parents may be associated with poorer child outcomes. Ramsden and Hubbard (2004) found that negative family emotional expressivity and the mother's acceptance of the child's behavior problems indirectly contributed to the child's behavior problems. Keller and Honig (2004) also found an association between child behavior problems and high maternal expressed emotion (i.e., critical and over-involved parenting style). However, due to the correlational nature of their study, it is unclear what role parental expressed emotion may have in the development or maintenance of child behavior problems, or conversely, what role child behavior problems may have in the development or maintenance of increases in parental expressed emotion. Parental negative emotional expressivity has also been shown to have other negative consequences to the child's emotional development. Dunn and Brown (1994) found that children's poor performance on emotional understanding and recognition tasks, less perspective taking in joint play and poorer reasoning during conflict were associated with higher negative emotions expressed within the family, suggesting that not only the importance of the emotionality conveyed in the parent-child interaction but also between family members, such as the parents. Additionally, emotional competence has been found to be related to parental expressive emotion modeling. Specifically, pre-school children who had parents who were more negative were found to be less socially competent (Denham et al., 1997). Taken together, these studies suggest that parents who exhibit poor emotion coaching and more negative affect may increase behavioral problems in their children through direct negative consequences (i.e., decreases in emotional competence) to the

child's emotional development. To our knowledge, the effects of emotion coaching on children with ASD have not been studied.

Another way in which parenting behaviors may affect the child's behavior is the behaviors exhibited between parents. Research also suggests that behaviors between the parents may influence ASD symptomatology. Kelley, Garnett and Attwood (2008) found that family conflict predict ASD symptomatology better than positive family/peer influences. Specifically, they found that family conflict influenced depression/anxiety symptomatology in the child which influence ASD symptomatology. Stuart and McGrew (in press) examined the impact of ASD on the individual caregiver, marital status and the family following the initial diagnosis. They found support that the child's symptom severity increased individual and familial burden; however, there was no relationship between martial adjustment and the child's symptom severity. Increased demands associated with increased burdens for the individual, family and marriage. A higher level of social support was found to be negatively associated with individual and family burdens. Passive avoidant coping strategies were found to be associated with increased burden for the individual, marriage and the family (Stuart & McGrew, in press). These findings help to create an understanding of how individuals, marriages, and families are impacted immediately following a diagnosis; however, it is unclear if this same relationship will remain as the individual, marriage, and family transition into acceptance of the diagnosis. Nonetheless, these findings provide evidence that the behaviors between the parents can influence the child's behavior.

#### **1.4 Study Aims**

In light of these findings, the proposed study will assess parental symptoms of anxiety and depression as related to behavioral problems in children and adolescents with ASD. Specifically, it is expected that parental anxiety/depression will be correlated with behavior

problems in youth with ASD, in accord with previous research (Hastings et al., 2003; Benson, 2006). Although considerable effort has been made to identify the external factors related to increases in parental stress and the association between parental anxiety/depression and child behavior problems, little effort has been made to examine the mechanisms that underlie the relationship between child behavior problems and parental anxiety/depression. The primary objective of this study, therefore, is to investigate the underlying mechanisms of the relationship between parental depression/anxiety with behavioral problems in children with ASD. A secondary objective is to clarify the direction of that relationship, examining how the child may impact the parent (i.e. through increased parenting stress and impaired parental self efficacy) as well as how the parent may impact the child (i.e., through impaired emotion coaching).

Parenting stress refers to the perceived stress of the parent in reaction to the demands of parenting their child, and suggests that the child's difficult behaviors contribute to the parent's negative mood. In this relationship, parental stress may serve to decrease parenting self-efficacy in mothers, and thus magnify maternal psychopathology (i.e., anxiety and depression), suggesting that the child is impacting the parent's response. Emotion coaching, on the other hand, refers to the way that parents address emotions with their child when the child expresses emotion (e.g., through talking, listening, avoiding, etc.). Parental anxiety and depression may thus serve to reduce positive emotion coaching, which in turn would magnify the child's behavior problems, suggesting that the parent's response is impacting the child's behavior. As such, this study will help to understand how these variables relate to one another in a reciprocal fashion when parenting a child with ASD. Specifically, we will explore if the relationship between child behavior problems and paternal anxiety/depression is potentially mediated through increases in parental stress.

### **1.5 Hypotheses**

As illustrated in Figure 1 and 2, it is hypothesized that:

1. Maternal stress will mediate the relationship between child behavior problems and maternal self-efficacy. Specifically, it is expected that increases in child behavior problems will lead to increases in parental stress, which will lead to decreases in parenting self-efficacy (Figure 1).
2. Maternal self-efficacy will mediate the relationship between parental stress and parent anxiety/depression. Specifically, it is expected that increases in parental stress will lead to decreases in parenting self-efficacy, which will lead to increases in parental anxiety/depression (Figure 1).
3. Emotion coaching will mediate the relationship between maternal anxiety/depression and the child's behavioral problems. Specifically, it is expected that maternal anxiety/depression will lead to poorer emotion coaching, which will lead to increases in child behavior problems (Figure 3).

## **Chapter 2**

### **Methods**

#### **2.1 Participants**

Participants consisted of 140 mothers of children between the ages of 3-16, diagnosed with ASD, specifically Autistic Disorder, Asperger's Disorder, or PDD-NOS. Four mothers were excluded from analyses because of incomplete responses to over half of the questionnaires, and two mothers were excluded because their children were younger than 36 months. Therefore, only 134 mothers were used in the final analyses. According to Fritz and MacKinnon (2007), to test a mediational analysis with a medium effect size for both paths using the causal steps method, approximately 75 participants are needed. For parents of multiple children with ASD, parents

were invited to complete the questionnaires for their oldest child with ASD. There were no other inclusion or exclusion criteria.

The average age of the mothers completing the study was 39.01 years ( $SD=8.01$ ). A majority of the parents were Caucasian (94.2%), followed by African-American (2.2%), Latino (1.4%), Native American (1.4%) and Asian/Island Pacificer (.7%).<sup>2</sup> Most parents reported having some education degree. Parents most often reported having some college education (29.5%), followed by having a graduate degree (27.5%), having a college degree (25.4%), having a high school degree (10.9%) and completing some graduate studies (6.5%); one participant did not answer this question. A majority of mothers reported that they did not have to end their employment because of their child's disability (67.4%) or decrease their hours at work to care for their child's disability (61.7%).

The average age of children with ASD was approximately 9 years, 2 months, with ages ranging from 3 years to 16 years, 10 months. A majority of the children were boys (79.9%). Most of the children were reported as being diagnosed with autism (56.9%), followed by Pervasive Developmental Disorder-Not Otherwise Specified (22.0), and Asperger's Disorder (21.2%). Approximately, half of the children (48.9%) had been diagnosed with another disorder. These additional diagnoses consisted of Attention-Deficit Hyperactivity Disorder, anxiety disorders, Oppositional Defiant Disorder, Bi-polar disorder, cognitive impairments, speech impairments and sensory disorders. On average, children were 4 years, 2 months when diagnosed, and it had been on average 4 years, 8 months since their diagnosis. Most children did not have a sibling diagnosed with ASD (83.7%).

The participants were recruited via flyers/announcements (see Appendix A) sent to local and national autism groups and organizations, and they were directed to a website where they could complete the following measures online. On all flyers or postings, potential participants

were referred to a link where they could access the online survey. The completion of the questionnaires signified the participants' consent. In the case that an interested participant did not have access to a computer, we provided our contact information so they could obtain a hard copy mailing.

## 2.2 Measures

*Demographics Questionnaire.* The demographic questionnaire (see Appendix B) contained questions regarding parent and child information (i.e., race, age, education status, and income level), as well as information about the child's diagnosis (i.e., age at which child was diagnosed, child's diagnosis, and current autism symptoms exhibited by the child). Regarding severity of ASD, parents were asked to select from a list of 56 common symptoms associated with ASD. For the purposes of creating a composite score, reported symptoms were classified into severity ratings for communication, reciprocal social interactions, and repetitive and restrictive behaviors based on the scoring algorithms of the Autism Diagnostic Observation Schedule-Generic (Lord, et al., 2000) and the Autism Diagnostic Interview-Revised (Lord, Rutter & LeCouteur, 1994). Items that did not clearly relate to one of these domains were not included in the severity score. The corresponding items in these categories can be found in Appendix C. The number of items reported by the parent was then summed in each category, creating an overall severity rating for that particular domain (i.e., communication severity, social severity and repetitive and restricted behaviors severity). Across the study, the average reporting of communication severity was 2.17 ( $SD=1.47$ ). The average reporting of social severity was 3.17 ( $SD=1.48$ ), and the average reporting of repetitive and restricted behaviors was 2.56 ( $SD=1.58$ ). For each subdomain, scores ranged from 0 to 6. Severity ratings in each domain were then summed to yield a composite severity score. The average reporting of overall child severity was 7.89 ( $SD=3.56$ ) with scores ranging from 1 to 16. The Cronbach's Alpha for the overall

child severity rating was .533. Low internal consistency may be accounted for by the heterogeneity of ASD symptoms.

*Co-parenting Questionnaire.* The Co-parenting Questionnaire was used to assess the type of co-parenting that is currently being used between the child's parents (see Appendix D). This measure was originally developed from a co-parenting interview (Ahrons, 1981; Maccoby, Depner & Mnookin, 1990). The Co-parenting Questionnaire consists of 20 questions in which parents are asked to rate statements about co-parenting behaviors on a scale from 1, *never*, to 5, *always*. Parents who tend to argue often, and often undermine the parenting efforts of the other parent are characterized as having a co-parenting style of "discord" (e.g., co-parenting style 1). Participants who score low on this subdomain are characterized as having a hostile co-parenting style. Parents who tend to talk frequently about the child, try to coordinate the household rules and try to isolate their interpersonal problems from their parenting role are characterized as having a co-parenting style of "cooperative communication" (e.g., co-parenting style 2). Participants who score high on this subdomain are characterized as having a cooperative communication style. Items for each subscale are summed and then averaged to yield a composite score. Across the study, the average reporting of a "discord" co-parenting style was 3.20 (SD=.69). Scores ranged from 1.90 to 4.60 on this subscale. The average reporting of a "cooperative communication" co-parenting style was 3.63 (SD=1.09). Scores ranged from 1.00 to 5.00 on this subscale. This measure's Cronbach's Alpha was .91.

*Depression Anxiety Stress Scale (DASS).* A 42 item self-report questionnaire (see Appendix E) that measures depression, anxiety and tension/stress on a scale from 0, *did not apply to me at all*, to 3, *applied to me very much or most of the time*. The depression/anxiety scales account for 28 of the total items. Reliability for the three scales, depression (.71), anxiety (.86) and stress (.88) are considered good. The depression scale correlates with the Beck

Depression Inventory (.74) and the anxiety scale correlates with the Beck Anxiety Inventory (.81) (Brown, Chorpita, Korotitsch & Barlow, 1997). Items for each subscale are totaled to yield a composite score with higher scores indicating more anxiety and depression. For the purposes of the current study, scores were collapsed over the depression and anxiety subscales to yield a total score of parent depression/anxiety. Tension/stress items were excluded to avoid overlap with the parenting stress construct. Across the study, the average reporting of parental depression/anxiety was 14.15 (SD=13.13). Scores were rather low in this sample and ranged from 0 to 63.00. The Depression Anxiety subscale had a Cronbach's Alpha of .94.

*Parent Emotional Styles Questionnaire (PESQ).* The PESQ (see Appendix F) was adapted from the Maternal Emotional Styles Questionnaire and is a 45 item self-report questionnaire that measures parenting emotional styles, in which participants rate statements on a scale from 1, *strongly disagree*, to five, *strongly agree*. MESQ was shown to have good stability, convergent validity, and construct validity (Lagacé-Séguin & Copland, 2005). The questionnaire yields two subscales, emotion coaching and emotion dismissive. Items for each subscale are averaged to yield a total score for each subscale. Across the study, the average reporting of emotion coaching was 4.01 (SD= .54). This measure's Cronbach's Alpha was .71. The emotion coaching subscale in particular had a Cronbach's Alpha of .68. Scores ranged from 2.86 to 5.00.

*Strengths and Difficulties Questionnaire (SDQ).* A behavioral screening questionnaire (see Appendix G), for children ages 3-16, in which the child's parent rates the child on 25 attributes that are both positive and negative. Parents are asked to indicate if statements about their child are *not true (1)*, *somewhat true (2)* or *certainly true (3)*. Items are divided into five categories, each consisting of five statements: conduct problems, hyperactivity, emotional symptoms, peer problems, and prosocial behavior. The questionnaire yields a total score that represents the child's difficulties. Reliability has been shown to be satisfactory on internal

consistency (Cronbach's alpha, .73), retest stability after 4-6 months (.62) and cross-informant correlation (.34; Goodman, 2001). SDQ scores above the 90th percentile predicted an increase in the probability of independently diagnosed psychiatric disorders (mean odds ratio: 15.7 for parent scales, 15.2 for teacher scales, 6.2 for youth scales; Goodman, 2001). All subscales, except for the prosocial behavior subscale, are summed to create a total score; higher scores indicate more difficulties. The total difficulties score will be used to operationalize child behavior problems. Across the study, the average reporting of child behavioral problems was 19.02 (SD=5.41). Scores ranged from 7.00 to 36.00. The measure had a Cronbach's Alpha of .72.

*Parenting Sense of Competence Scale (PSOC).* The PSOC (see Appendix H) is a 16-item self-report measure that assesses parental self-competency in the parental role (Johnston & Mash, 1989; Ohan, Leung & Johnston, 2000). This questionnaire contains two subscales, parental self-efficacy and parenting satisfaction, and measures them on a 6-point Likert scale, 1, *strongly agree*, to 6, *strongly disagree*. The self-efficacy subscale measures the parent's perception of the degree to which she/he has acquired the necessary skills and understanding for the parental role and has been shown to have an alpha coefficient of .80. The parenting satisfaction subscale measures the degree to which the parent perceives that she/he values and is comfortable within the parental role and has been shown to have an alpha coefficient of .69. The alpha coefficient for the total score has been shown to be .80. For the purposes of the current study, the self-efficacy subscale was used to assess parental self-efficacy. Scoring for some of the items within this subscale are reversed so that higher scores reflect greater parental self-efficacy. All items within this subscale are totaled to create an overall score of parental self-efficacy. Across the study, the average reporting of parental self-efficacy was 25.64 (SD=2.86).

Scores ranged from 18.00 to 34.00. The parenting self-efficacy subscale had a Cronbach's Alpha of .69.

*Questionnaire on Resources and Stress-Short Form (QRS-SF).* The QRS-SF (see Appendix I) is a 52-item short form questionnaire of Holroyd's (1974) QRS. It is a parent self-report measure that assesses the family's response to the child's disability (Friedrich, Greenberg & Crnic, 1983). The questionnaire contains four factors: parent and family problems (i.e., problems related to the family functioning or parental well-being that are associated with the child's disability); pessimism (i.e., pessimistic views of the child's future); child characteristics (i.e., the child's impairments and difficulties in various aspects of functioning); and physical incapacitation (i.e., physical impairments related to the child's disability). Parents are asked to indicate if a statement is *true* or *false*. Reliability has been shown to be good (Kuder-Richerdson -20 reliability, .95). Item-total correlation (.15-.63) and inter-item correlation (.26) have also been shown to be satisfactory. Items are summed together to yield a total score with higher scores indicating higher parental stress. The average reporting of parental stress was 29.32 (SD=5.18). Scores ranged from 17.00 to 43.00. This measure's Cronbach's Alpha was .62.

### **2.3 Procedures**

Participants were administered the questionnaires via an online survey. They read an information sheet (Appendix J) about the study and then completed the scales. Completion of the survey signified their consent. The total session was estimated to take about 45 minutes.

## **Chapter 3**

### **Results**

#### **3.1 Analytic Plan and Expected Results**

First, descriptive statistics were gathered for all measures. The data were assessed to ensure that they met the assumptions of the statistical test chosen. Additionally, the data were

assessed for missing data, outliers and normality of the distribution. The effects for parental demographics with parenting stress, emotion coaching, and child behavior problems were explored. Variables were used as covariates if found to significantly and systematically relate to parenting stress, emotion coaching, self-efficacy, and/or child behavioral problems. Prior to conducting regressions to determine mediation among the variables in the model, general relationships among the variables were explored by computing Pearson's zero-order correlations. It was expected that child behavior problems and parental anxiety/depression would be correlated. To determine the presence of mediation, a series of regressions were conducted as recommended by Holmbeck (2002) and Baron and Kenny (1986) for each of the following relationships: a) the effect of parent stress (e.g., proposed mediator) on the relationship between the child behavior problems (e.g., predictor) and self-efficacy (e.g., outcome) for mothers, b) the effect of self-efficacy (e.g., proposed mediator) on the relationship between parental stress (e.g., predictor) and parental anxiety/depression (e.g., outcome) and c) the effect of emotion coaching (e.g., the proposed mediator) on the relationship between parent anxiety/depression (e.g., predictor) on child behavioral problems (e.g., outcome). One-tailed tests were used for mediational analyses because of the *a priori* hypotheses given. All other analyses were conducted using two-tailed tests because of their exploratory nature.

For those relationships that showed significant mediation, post-hoc probing techniques were used to further assess the mediation (Baron & Kenny, 1986; Holmbeck, 2002). The first step in the post hoc probing method involved using path coefficients to compute the indirect effect of the predictor on the outcome with the mediator in the model. Specifically, the unstandardized beta (B) of the direct effect of the predictor on the mediator was multiplied by the unstandardized beta (B) of the direct effect of the mediator on the outcome to obtain the unstandardized beta (B) of the indirect effect of the predictor on the outcome with the mediator

in the model. Essentially this step involved multiplying the two individual direct effects in order to obtain the indirect effect, which included all three variables. The second step in the post hoc probing method involved computing the percentage of the path from the predictor to the outcome accounted for by the mediator. Specifically, the obtained unstandardized beta (B) of the indirect effect was divided by the unstandardized beta (B) of the total effect (i.e., the effect of the predictor on the outcome *without* the mediator in the model) to arrive at this percentage.

Correlation tables for both composite scores and subdomain scores were examined to determine other relationships that may exist, and supplementary analyses were conducted.

### **3.2 Evaluating Regression Assumptions**

Prior to regression analyses, the normality of distribution assumption was evaluated for all variables. Parental stress, parental self-efficacy, and parental emotion coaching all approximated a normal distribution. The distribution for parental anxiety/depression was negatively skewed. The variable was transformed with a square root transformation and more closely approximated normality. Further exploration of the new distribution still indicated violation of the assumption of normality; therefore, results using this variable should be interpreted with caution. The distribution for co-parenting style 1 and co-parenting style 2 were positively skewed. The variables were transformed utilizing a reflect and square root transformation. Further exploration of the skewness and kurtosis of the new distributions indicated that these indices were within acceptable limits. However, the Wilkes-Shapiro tests indicated distributions that significantly varied from a normal distribution. The specific type of transformation of the aforementioned variables was chosen based on the initial shape of the distribution.

Additionally, the assumptions of linearity, homoscedasticity and multicollinearity were also explored for each regression analyses. Residual scatterplots were examined to assess the

assumptions of homoscedasticity and linearity. All regression models met the aforementioned assumptions.

### **3.3 Demographic Effects**

The associations between demographic factors and the dependent variables (i.e., depression/anxiety, parenting self-efficacy, and child behavior problems) were assessed. Associations between dichotomous variables (i.e., the child's gender, the child's and parent's education, the child's current diagnosis and time since diagnosis) and the dependent variables were assessed using ANOVA, and associations between continuous variables (i.e., child's and parent's age) and the dependent variables were assessed using Pearson's correlations.

A significant association between parental stress and the child's current ASD diagnosis was also found,  $F(2,133) = 3.571, p = .031$ . Follow-up analyses revealed that parents of children with autism ( $M = 30.19$ ) reported significantly more stress than parents of children with PDD-NOS ( $M = 27.68$ ). A significant association was also found between parental stress and parental age,  $r(133) = .171, p = .044$ . As age increased, parental stress scores increased. No other significant relationships were found. Because parent's age and the child's current ASD diagnosis were found to have a significant relationship with parental stress, these variables were retained as covariates within the analyses described later.

### **3.4 Primary Regression Analyses**

Using the steps of mediation outlined by Baron and Kenny (1986) and Holmbeck (1997), a series of regression analyses were conducted to assess parental stress, parental self-efficacy and emotion coaching as potential mediators (hypotheses 2, 3 and 6 respectively). To assess each potential mediator, four regression analyses were conducted (totaling 12 regression analyses). Prior to conducting the analyses, correlations among variables were examined to assess trends in

the relationships among variables (see Table 1). Parental stress was positively associated with depression/anxiety,  $r(133) = .50, p = .001$  and child behavior problems  $r(133) = .27, p = .002$ , as well as negatively correlated with parental self-efficacy,  $r(133) = -.168, p = .049$ , such that increases in parental stress were associated with increases in parent depression/anxiety symptoms and child behavior problems as well as decreases in parent self-efficacy. ASD severity was positively associated with child behavior problems,  $r(133) = .21, p = .01$  and negatively associated with self-efficacy,  $r(133) = -.18, p = .04$ , such that increases in the child's overall ASD severity was associated with increases in the child's overall child behavior problems and decreased maternal self-efficacy. Co-parenting style 1 (i.e., hostile co-parenting behaviors) and co-parenting style 2 were positively associated,  $r(133) = .697, p = .001$ . According to this finding and the positive skewness of the distributions of both co-parenting 1 and co-parenting 2, it seems that mothers within this sample are experiencing both low levels of hostile exchanges and high levels of cooperative communicative co-parenting behaviors.

Additionally, control variables were entered to account for variance by parent's age and ASD diagnosis in regression models examining parental stress.<sup>1</sup> The first regression analysis examined the relationship of the predictor and the criterion. The second regression analysis examined the relationship of the predictor and the potential mediator. The third regression analysis examined the relationship of the potential mediator and the criterion and the fourth regression analysis examined the effect of the predictor and the potential mediator on the criterion. Based on the hypotheses given, regressions were conducted using one-tailed tests. Power for each regression analysis was calculated using G\*Power (Faul, Erdfelder, Lang & Buchner, 2007). Power above 80% is typically recommended for finding a relationship between variables should a relationship exist. Additionally, as a way to further explain the mediation, the

proportion of the total effect that was mediated was calculated by multiplying the unstandardized regression coefficients of paths a and b and dividing by the unstandardized regression coefficient of path c (Shrout & Bolger, 2002).

First, the potential mediating role of parental stress between child behavior problems and parental self-efficacy was tested. The first equation analysis tested the influence of child behavior problems on self-efficacy, which yield a significant result,  $t(133) = -1.83, p = .035$ . The second equation tested the influence of child behavioral problems on parental stress, which yielded a significant result,  $t(133) = 2.903, p = .002$ . The third equation tested the influence of parental stress on parental self-efficacy, which yielded a significant result,  $t(133) = -2.48, p = .0005$ . The fourth equation tested the influence of child behavior problems and parental stress on parental self-efficacy. Parental stress was significant,  $t(133) = -2.114, p = .018$ , whereas child behavior problems was no longer significant,  $t(133) = -1.10, p = .137$ . A Sobel test was then conducted to examine the significance of the indirect effect of parenting stress by examining its total effect on the relationship between child behavior problems and parental self-efficacy (path c) and its direct effect on parental self-efficacy (path c'). The Sobel test was significant at the one-tailed level ( $t = 1.71, p = .04$ ), indicating that parenting stress mediated the relationship between child behavior problems and parental self efficacy. Power was approximately 44%, indicating that there was a 44% chance of finding a relationship between child behavior problems and parental self-efficacy should a relationship between these variables exist. The total proportion of variance accounted for by the mediator (i.e., parental stress) was 32.8%. For reporting of R square, R square change, and betas of each regression equation, please refer to

Table 2.

Second, the potential mediating role of parental self-efficacy between parental stress and parental anxiety/depression was tested. For all analyses, control variables (i.e., parental age and child ASD diagnosis) were entered into the models first. The first regression analysis tested the influence of parental stress on parental depression/anxiety, which yielded a significant result,  $t(133) = 5.56, p = .0005$ . The second equation tested the influence of parental stress on parental self-efficacy, which yielded a significant result,  $t(133) = -2.48, p = .0005$ . The third equation tested the influence of parental self-efficacy on parental depression/anxiety, which yielded a significant result,  $t(133) = -3.87, p = .0005$ . The fourth regression analysis tested the influence of parental stress and parental self-efficacy on parental depression/anxiety. Both parental stress,  $t(133) = 4.93, p = .0005$  and parental self-efficacy,  $t(133) = -3.26, p = .0005$  yielded significant results, indicating a possible partial mediation. Power was approximately 99%, indicating that there was a 99% chance of finding a relationship between parental stress, parental self-efficacy and parental anxiety/depression should a relationship between these variables exist. A Sobel test was then conducted to examine the significance of the indirect effect of parenting self-efficacy by examining its total effect on the relationship between parental stress and parental anxiety/depression (path c) and its direct effect on depression/anxiety (path c'). The Sobel test was significant at the one-tailrd level ( $t = 1.86, p = .03$ ), indicating that parenting self-efficacy partially mediated the relationship between parental stress and parental anxiety/depression. The proportion of variance accounted for by the partial mediator (i.e., parental self-efficacy) was 14.2%. For reporting of R square, R square change, and betas of each regression equation, please refer to Table 3.

Finally, parental emotion coaching was tested as a potential mediator between parental anxiety/depression and child behavior problems. First, a regression analysis was conducted to

tested the influence of parental depression/anxiety on child behavior problems, which was not significant,  $t(133) = .437, p = .331$ . Due to the fact that parental anxiety/depression was not found to have a significant relationship with child behavior problems further regression analyses were not conducted and support was not found for emotion coaching as a mediator between parental anxiety/depression and child behavior problems. Power was approximately 32%, indicating that there was a 32% chance of finding a relationship between parental depression/anxiety and child behavior problems should a relationship between these two variables exist. For reporting of R square, R square change, and betas of each regression equation, please refer to Table 4.

### **3.5 Supplemental Analyses**

The correlations among the subdomain scores of child characteristics and behaviors and the subdomain scores of other variables were explored (see Tables 5 and 6). Child conduct problems score was positively associated with child emotional symptoms,  $r(133) = .354, p = .001$ , child hyperactivity,  $r(133) = .379, p = .001$ , the child's social severity,  $r(133) = .396, p = .001$ , and the child's repetitive and restricted behavior severity,  $r(133) = .262, p = .002$ . Children who exhibited increases in conduct problems also exhibited increases in emotional symptoms, hyperactivity, social severity and repetitive and restricted behavior severity. The child's emotional symptoms were positively associated with peer problems,  $r(133) = .195, p = .023$  and social severity,  $r(133) = .210, p = .014$  and negatively associated with communication severity,  $r(133) = -.175, p = .042$ . Children who exhibited increases in emotional problems also exhibited increases in peer problems and social severity. Surprisingly, children who experienced increases in emotional symptoms also exhibited decreases in communication severity. This may represent issues of mothers' reporting of emotional symptoms or may indicate differences in emotional

symptoms for certain children. Child hyperactivity was positively associated with repetitive and restricted behaviors severity,  $r(133) = .310, p = .001$ , parent depression/anxiety,  $r(133) = .213, p = .012$  and parental stress,  $r(133) = .172, p = .045$ . Children who exhibited increases in hyperactivity also exhibited increases in repetitive and restricted behaviors severity and their mothers also exhibited increases in depression/anxiety symptoms and parental stress. Children's peer problems were positively associated with social severity,  $r(133) = .555, p = .001$ . Children who had increases in peer problems also had increases in social severity. Communication severity was positively associated with social severity,  $r(133) = .315, p = .001$  and repetitive and restricted behaviors,  $r(133) = .260, p = .002$ ; social severity was also positively associated with repetitive and restricted behavior severity,  $r(133) = .232, p = .007$ . Increases in communication severity in children was associated with increases in both social and repetitive and restricted behaviors severity, and increases in social severity were associated with increases in repetitive and restrictive behavior severity.

There was also a significant correlation between communication severity and conduct problems,  $r(133) = .249, p = .004$  and communication severity and self-efficacy,  $r(133) = -.206, p = .017$ . Specifically, increases in conduct problems were associated with increases in communication severity in the child, and increases in the child's communication severity were associated with decreases in the mother's self-efficacy. The first regression explored the relationship of conduct problems and parental self-efficacy, which yielded a non-significant result,  $t(133) = -1.766, p = .080$ . Because conduct problems did not have a significant effect on parental self-efficacy, there is no evidence that communication severity mediates the relationship between conduct problems and parental self-efficacy. Therefore, it seems that the effect of

communication severity on conduct problems and on parental self-efficacy may be two independent effects.

A significant relationship between conduct problems and emotion coaching also emerged,  $r(133) = -.228, p = .008$ . Furthermore, parental self-efficacy was marginally associated with child conduct problems,  $r(133) = -.154, p = .074$ . Because of the nonsignificant relationship between parental self-efficacy and child conduct problems, there was no evidence for a mediating role of parental self-efficacy between child conduct problems and emotion coaching. Therefore, to further explore the relationship between conduct problems and emotion coaching, the potential role of parental self-efficacy in moderating this relationship was assessed. A hierarchical regression was conducted to determine if parental self-efficacy moderated the relationship between conduct problems and emotion coaching. Prior to conducting the regression, each predictor's variables mean was subtracted from each score to center the scores and reduce multicollinearity. In the first step, conduct problems and parental self-efficacy were added as predictors of emotion coaching. Conduct problems and self-efficacy accounted for 5.9% (adjusted  $R^2$ ) of the variance in emotion coaching,  $F(5, 131) = 2.638, p = .03$ . Conduct problems was not found to be a significant predictor,  $t = 1.876, p = .063$ . Likewise, self-efficacy was not found to be a significant predictor,  $t = .725, p = .47$ . In the second step, the interaction term (conduct problems x parental self-efficacy) was added to examine potential moderating effects, and it accounted for an additional 2.2%, total adjusted  $R^2 = 8.1\%$ ,  $F(6, 131) = 2.471, p = .015$ . The interaction was probed by examining emotion coaching on conduct problems at two different levels of parental self-efficacy (i.e., one standard deviation above and below the mean). At one standard deviation above the mean of parental self-efficacy, a main effect of conduct problems emerged,  $t(133) = 3.119, p = .002$ . There were no main effects noted at one standard

deviation below the mean. Findings suggest that there is a positive relationship between conduct problems and emotion coaching in mothers with high levels of self-efficacy (see Figure 4)

The associations between parenting behaviors and other variables were also explored (Table 4). There was a negative relationship between co-parenting style 1 and social severity,  $r(133) = -.19, p = .03$ . Low levels of hostile co-parenting are associated with decreases in the child's social impairments. There was a negative relationship between co-parenting style 2 and conduct problems,  $r(133) = -.20, p = .02$ . Cooperative communication between parents was associated with decreases in the child's conduct problems. There was a positive relationship between emotionally dismissive parenting and repetitive and restricted behavior severity,  $r(133) = .17, p = .048$  and emotion coaching,  $r(133) = .36, p = .001$ . As repetitive and restricted behaviors increased, emotional dismissive parenting also increased. Emotional parenting styles is an orthogonal construct, thus it is possible for a parent to be high in both emotion coaching and emotionally dismissive parenting styles. The positive relationship between emotion coaching and an emotionally dismissive parenting style suggests that mothers use both depending on the context and situation, as varying parental styles may be used to accomplish different goals. There was also a negative relationship between emotional dismissive parenting and conduct problems,  $r(133) = -.19, p = .02$  and emotional symptoms,  $r(133) = -.10, p = .02$ . As emotional dismissive parenting increased both conduct problems and emotional symptoms in the child decreased.

## **Chapter 4**

### **Discussion**

The purpose of the current study was twofold: (i) examine mechanisms that may underlie the relationship between child behavior problems and parental anxiety/depression and (ii) examine the direction of that relationship, specifically how the child may impact the parent and

how the parent may influence the child. It was predicted that (i) parental stress would mediate the relationship between child behavior problems and parental self-efficacy; (ii) parental self-efficacy would mediate the relationship between parental stress and parental depression/anxiety; and (iii). Emotion coaching would mediate the relationship between parental anxiety/depression and child behavior problems. Overall, the primary findings supported the first two hypotheses, indicating that parental stress mediated the relationship of child behavior problems and parental self-efficacy, and that parental self-efficacy partially mediated the relationship between parental stress and parental depression/anxiety. Findings also suggested the direction of influence is from the child to the parent, at least in terms of the constructs examined in this study.

#### **4.1 Background Variables that may influence Parental Stress on Depression/Anxiety**

Prior to analyses, the relationship of demographic variables and dependent variables were explored. Two demographic variables were related to parental stress and subsequently used as control variables, but also may be interesting in their own right.

The child's current ASD diagnosis was also related to mothers' reports of stress. Specifically, mothers of children with an autism diagnosis reported more stress than mothers of children with Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS). Children diagnosed with autism tend to display more severe difficulties with social interactions, communication and repetitive and restricted behaviors. Therefore, these behaviors may impede on the parent-child relationship more and may impede on the child's ability to be independent of the parent, which could lead to increases in the parent's stress.

Lastly, a positive significant relationship was also found between the parent's age and level of stress, suggesting that older mothers are reporting higher levels of stress. Older mothers may find it more difficult to deal with the demands of raising a child with ASD. Moreover,

societal and parental expectations of the child's development of independence generally assume that as a child ages, their independence also increases. Given the nature of ASD, this development of independence is often impeded, and thus the child's caregiving needs and demands may increase over time. In turn, the increased needs and demands may serve to increase parental stress.

#### **4.2 Potential Mechanisms Underlying Child Behavior Problems and Parental Depression/Anxiety**

One aim of the current study was to examine the potential mechanisms that underlie the relationship between child behavior problems and parental depression/anxiety. It was predicted that parental stress would mediate the relationship between child behavior problems and parental self-efficacy. Support was found for the mediating role of parental stress between child behavior problems and parental self-efficacy. Specifically, as child behavior problems increased parental stress increased and then parental self-efficacy decreased. Similar to prior work (Beck, Daley, Hastings & Stevenson, 2004; Benson, 2006; Gray & Holden, 1992; Hastings, 2003; Hastings et al., 2005a; Ireys & Silver 1996; Sanders & Morgan, 1997), the current study found support for the influence of child behavior problems on mothers' stress levels and indirectly on maternal self-efficacy in that as maternal stress increased self-efficacy decreased. Additionally, increased parental stress has been shown to uniquely contribute to decreases in parent's self-efficacy (Kuhn & Carter, 2006). The current study did find evidence that child behavior problems are directly influencing parental self-efficacy. Parental self-efficacy has also been found to be influenced by other parental characteristics, such as coping style, and guilt (Coleman & Karraker, 1998; Kuhn, & Carter, 2006; Jackson & Huang, 2000; Pakenham, Sofronoff & Samios. 2004); future research should attempt to tease apart which parental characteristics are most influencing both child behavior problems and parental self-efficacy.

Additionally, it was predicted that parental self-efficacy would mediate the relationship between parental stress and parental anxiety/depression. The current study did find support for the partial mediating role of parental self-efficacy between parental stress and parental anxiety/depression. Findings suggest that as parental stress increased, parenting self-efficacy decreased and parental anxiety/depression then increased. The study adds to Hasting and Brown's (2002) findings that self-efficacy mediates the relationship between child behavior problems and parental anxiety/depression and provides a richer understanding of how parental self-efficacy functions in relation to other parental characteristics and behaviors. However, unlike Hastings and Brown's (2002) findings, the current study only found support for the role of parental self-efficacy as a partial mediator. In their study of 26 mothers and 26 fathers, Hastings and Brown (2002) operationalized parent self-efficacy to include the parent's perception of their efficacy in relation to their child's problem behaviors. Specifically, parents were asked to rate feelings of competence, their control and satisfaction in dealing with problem behaviors, their perception of how positively they impact their child's problem behaviors and how difficult they find their child's problem behaviors. However, the Parenting Sense of Competency Scale self-efficacy subscale provides a more global assessment of parenting self-efficacy. Specifically, parents are asked how easy their child's problems are to solve, how they perceive themselves as a model for other parents, how well they meet the expectations of their child, how familiar they perceive themselves to be with the parenting role and how strong they perceive their parenting skills to be. Obtaining a more direct measure of self-efficacy in relation to child behavior problems may provide a more domain-specific way in which self-efficacy influences child behavior problems.

Lastly, the potential mediating role of emotion coaching between parental depression/anxiety and child behavior problems was examined. The current study found no support for the mediating role of emotion coaching between parental depression/anxiety and child behavior problems because of the nonsignificant relationship between depression/anxiety and child behavior problems. This finding is inconsistent with prior research. Three potential explanations exist for this incongruent finding. First, the study did not evidence adequate power to find evidence for the relationship should it exist. Second, parental reports of anxiety/depression were found to be negatively skewed, indicating a possible underreporting of depressive/anxiety symptoms that may reflect an artifact of the current sample. Third, given that the average age of the child in the study is approximately 9 years, 2 months, it is possible that many of these parents are already receiving services to address their child's needs and/or receiving services to address their own emotional needs. The current study did not directly assess the types of services and supports that families are receiving, and this may be a fruitful demographic variable to assess in future research involving anxiety/depression levels of parents of children with ASD.

The current study also found no support for the relationship between emotion coaching and child behavior problems. Emotion coaching has generally been found to influence emotional competence and emotional behaviors in children (Gottman et al., 1996; 1997). The current study did not directly examine children's emotional competence, emotional regulation skills and other variables that may be strong indicators of the child's emotional development. Instead, child behavior problems, as defined within the current study, centered on internalizing and externalizing symptomatology. Although the child's externalizing and internalizing behaviors may be influenced by the child's emotional development, these behaviors may be so far removed

from the influences of the mother's emotional coaching parenting style that the relationship between emotion coaching and child behavior problems remains weak. Therefore, future research should seek to examine the effect of emotion coaching on the child's emotional development to examine its utility within this population.

The current study also did not find support for the relationship between emotion coaching and parental anxiety/depression. It is also possible that other parent characteristics are more likely to be influencing the child, such as the parent's emotional competence, warmth, or child-rearing practices (e.g., authoritative versus authoritarian parenting styles; Woolfson & Grant, 2006). Future research should examine the role of these variables within the relationship of child behavior problems and parent anxiety/depression.

#### **4.3 Direction of Effects between Parents and Children**

A second aim of the study was to examine how the child may impact the parent and/or how the parent may influence the child. The primary findings suggest a mediational relationship of stress with child behavior problems and parental self-efficacy. As child behavior problems increased, parental stress increased and self-efficacy decreased. This finding suggests that child behavior problems have a direct effect on the amount of stress the mother is experiencing and an indirect effect on her level of parental self-efficacy. Parental self-efficacy was also found to partially mediate the relationship between parental stress and parental depression/anxiety. This finding suggests high levels of parental stress decrease parental self-efficacy, which then increases the amount of depression/anxiety symptoms the mother experiences. Overall, findings suggest a direction of influence from the child to the parent, at least in terms of the constructs examined in this study. Additional supplemental analyses were conducted to further explore ways in which the child may affect parental characteristics and parenting behaviors.

In addition to the mediational analyses reported above, supplemental analyses supported the notion that the child influences parental characteristics and parental behaviors. There was a negative relationship found between communication severity and parental self-efficacy, and there was a positive relationship found between communication severity and conduct problems. The mediating role of communication severity between parental self-efficacy and conduct problems was not supported, suggesting that the influence of communication severity on both parental self-efficacy and conduct problems are independent relationships. More specifically, communication severity seems to be associated with a negative impact on parent's self-efficacy. Communication severity in children with ASD are often one of the most salient features of the disorder and may be the most difficult for parents to accommodate to because of the function of communication in social interactions, meeting the wants and needs of the child, and receiving positive regard from the child. The current study also suggests that children who have higher levels of conduct problems display more difficulties with communication. For these children, conduct problems may be a function of communication, and the relationship of conduct problems and communication difficulties may influence and instigate each other.

Additionally, an association was also found between parental self-efficacy and the child's symptom severity. As symptom severity increased, the mother's self-efficacy decreased. However, further exploration of parental self-efficacy revealed a more complex understanding of how parental self-efficacy functions in relation to other child and parent behaviors. Specifically, it was found that mothers increased their emotional coaching behaviors in response to increased child conduct behaviors only when the mother had high self-efficacy. Thus, increased parental self-efficacy are not only associated with decreased parental stress and parental anxiety/depression, but also can positively affect parenting behaviors in response to conduct

problems. Therefore, parental self-efficacy may be a key mechanism that influences not only parental mood but also parenting behaviors and also provides another way in which child behaviors may influence the mother's behaviors.

Lastly, the role of parenting behaviors and its influence on other parental characteristics and child behaviors were explored. Support was found for a positive association between co-parenting style 1 (i.e., hostile exchanges between the parents) and co-parenting style 2 (i.e., cooperative communication), indicating that mothers reported both high cooperative communicative co-parenting and low levels of hostile exchanges between them and the child's father. Additionally, findings suggest that as peer problems increase cooperative communicative exchanges between the parents increase and cooperative communication styles between the parents decreased child conduct problems. Again, in relation to issues regarding the child, cooperative communicative styles may work best and thus, parents change their mode of interacting with each other to best accommodate the child. Increases in the child's social problems were found to relate to low levels of hostile exchanges between parents. Parents may engage in less hostile exchanges in response to dealing with the child's social problems, adding further support that parents may change their interaction style to best meet the needs of their child. In light of these findings, it is important to note that these findings are exploratory, and the theoretical explanations for this relationship are purely speculative.

Emotional dismissive styles of parenting were found to be positively associated with emotion coaching and repetitive and restricted behavior severity. The Parent Emotional Styles Questionnaire measures the construct of emotional parenting style as an orthogonal construct, such that a parent can be high on both emotion coaching and emotionally dismissive styles. As discussed above in relation to co-parenting behaviors, parents may change their style of

emotional parenting to best accommodate the child. Further, findings suggest that in relation to the child's repetitive and restricted behavior severity, mothers' emotionally dismissive parenting style increases. Mothers may display a more emotionally dismissive parenting style in this context as a way to withhold reinforcement for these behaviors. Emotionally dismissive parenting was also found to have a negative association with conduct problems and emotional symptoms. As mothers' emotionally dismissive styles increase, child conduct problems and emotional symptoms decrease. Thus, this may indicate a way in which mothers can effect change on these child problem behaviors. It is plausible this may be a result of what mothers learned (i.e., ignore the problem behavior and only reinforce the desirable behaviors) in early intervention services, such as Applied Behavior Analysis.

Findings suggest that several child characteristics impact various parent characteristics. Child hyperactivity was found to be positively associated with parental characteristics (i.e., parental stress and mothers' anxiety/depression symptoms). The mother's emotionally dismissive style of parenting was found to decrease child behaviors (i.e., conduct and emotional symptoms). However, the mechanism that seems most important in influencing parent characteristics and behaviors is parenting self-efficacy, as it was found to moderate the relationship between child conduct problems and parent emotion coaching and partially mediate the relationship between parental stress and parental anxiety/depression. Parental stress also seems to be an important underlying relationship as it was found to mediate the relationship between child behavior problems and parental self-efficacy. Lastly, behaviors between the parents suggest that this population exhibits high levels of cooperative communication and low levels of hostile exchanges in co-parenting style. Given the pervasiveness of ASD, parents are probably forced to work together to deal with problems associated with the disorder.

#### 4.4 Other Findings

In addition to the current study's main aims, the current study also provides additional information that helps to clarify the symptoms exhibited by children with ASD. Conduct problems were found to be positively associated with emotional symptoms, hyperactivity, social severity and repetitive and restricted behavior severity. Taken together, these findings suggest that children experiencing high levels of emotional symptoms, hyperactivity, social severity and repetitive and restricted behavior severity are at risk for developing high levels of conduct problems. Most likely conduct problems develop as a way for the child to meet their communicative and social needs and wants. Further, child emotional symptoms was found to be positively associated with peer problems and social severity, as well as negatively associated with communication severity. Children experiencing emotional symptoms may be at increased risk of developing peer problems. Additionally, child emotional symptoms may be instigated by social difficulties. Surprisingly, child emotional symptoms were also found to be associated with low levels of communication severity. However, statements associated with child emotional symptoms on the Strengths and Difficulties Questionnaire (SDQ) center on the child's ability to communicate his or her worry, somatic symptoms and fearfulness to his or her parent. Therefore, it is possible that children may be experiencing these symptoms, but mothers are not characterizing them as emotional symptoms as defined by the SDQ. It is also plausible that higher functioning children may have a better sense of self-awareness that could increase their emotional symptoms. Tonge, Breteton, Gray and Einfeld (1999) found that children with Asperger's Disorder evidenced more emotional disturbance than children with high-functioning autism. Hyperactivity was found to be positively associated with repetitive and restricted behaviors, and peer problems were found to be positively associated with social severity.

Children evidencing high hyperactivity also evidence high levels of repetitive and restricted behaviors. These children may have an underlying need for high levels of sensory input that drive both their hyperactivity and need for self-stimulatory behaviors. As expected, children with high levels of social severity also experience high level of peer problems.

#### **4.5 Theoretical Implications**

The current study increases the understanding of the intricate relationship between parental behaviors and characteristics and child behaviors and characteristics. Specifically, the current study provides support for ways in which parent characteristics and behaviors may influence child characteristics and behaviors. In particular, the current study adds support for the mediating role of parenting self-efficacy between parental stress and parental depression/anxiety and the mediating role of parental stress between child behavior problems and parental self-efficacy. However, it also suggests ways in which parental self-efficacy may be influenced by child characteristics (e.g., communication severity) and may influence the relationship between child behaviors (e.g., conduct problems) and parenting behaviors (e.g., emotion coaching). These results combine to create an intricate picture of the role of self-efficacy in relation to other parenting characteristics and child and parenting behaviors. Additionally, the current study provides information on ways in which behaviors between the parents (e.g. co-parenting behaviors) may influence child behaviors (e.g., conduct problems). Taken together, these results provide support for the exploration of a comprehensive model of how parental characteristics and behaviors and child characteristics and behaviors may behave simultaneously (see Figure 5).

The study also provides key information on variables that do not seem to underlie specific relationships. In particular, emotion coaching was not found to underlie the relationship between parental anxiety/depression and child behavior problems, and in fact was unrelated to all

of the primary variables addressed in this study (i.e., child behavior problems, stress, self-efficacy, and co-parenting). Further, the study provides key information on the way in which emotion coaching may be functioning within this population. Emotionally dismissive parenting was found to be associated with decreases in behavior problems within this population. This finding suggests that unlike a typically developing child (Ramsden & Hubbard, 2002), emotionally dismissive parenting may actually work better for this population. It is plausible that emotionally dismissive parenting works well in this population because parents are ignoring problem behavior, which helps to decrease its frequency. Emotion coaching and emotionally dismissive parenting were found to be positively associated in the current study. However, research examining these processes within families of typically developing children have found a negative relationship between the two parenting styles (Lunkenheimer, Shields & Cortina, 2007). Additionally, the Parent Emotional Styles Questionnaire may not be appropriate for this population. Questions center on the child's ability to express emotionality to the parent which presents difficulties for this population because one feature of ASD is difficulty in communicating and recognizing emotions. More research is needed to fully understand how emotion coaching behaviors influence child behaviors within this population. Emotion coaching represents a potential way in which parents may address behaviors in their child, while increasing emotionality between the child and the parent. However, the contexts in which emotion coaching may help or may hinder the descalation of problem behaviors, while increasing the understanding of emotions in children with ASD has yet to be explored.

Lastly, the current study provides an emphasis on the behaviors exhibited within the parental unit to provide an examination of how the child's disability may affect not only the mother's parenting behaviors and characteristics but the way in which mothers interact with the

child's father. To our knowledge this is the first study to examine the ways in which the parent's co-parenting behaviors may be influenced by raising a child with ASD. Focusing on co-parenting behaviors may provide information that allows professionals ways of directly influencing co-parenting behaviors to achieve symptoms reduction for the child and parents. In other words, understanding how co-parenting behaviors affect child symptomatology may inform interventions aimed at teaching more effective co-parenting behaviors to help reduce parental anxiety/depression and stress, as well as ASD symptoms in children. Future research should examine the co-parenting relationship more fully at different stages of the coping process to explore a more detailed way in which this relationship changes in response to raising a child with ASD. Similarly, future research should also examine changes in the family structure that might occur in response to raising a child with ASD. Examining a multi-dimensional approach to the impact of a child with ASD will further the development of effective interventions for parents and families affected by ASD.

#### **4.6 Limitations**

The current study had several limitations. First, the study did not examine the parenting experience of fathers. To date, few studies have examined the differences in parenting experiences of fathers and mothers. Hastings and Brown (2002) examined the role of parental self-efficacy for mothers and fathers and found evidence that its relationship to parental stress and parental psychopathology differed in mothers and fathers. In mothers, they found evidence for a mediating role of self-efficacy between stress and psychopathology. In fathers, they found evidence for a moderating role of self-efficacy in the relationship of stress and psychopathology. Keller and Honig (2004) found that fathers had a more difficult time establishing a bond with their affected child. Studies examining the parenting experience of fathers have found that fathers report less internalizing symptoms than mothers (Hastings et al., 2005b; Bitsika &

Sharpley, 2004). These studies suggest that the experience is different for mothers and fathers of children with ASD. For fathers, parental stress may underlie the relationship of child behavior problems and paternal anxiety/depression, with self-efficacy moderating this relationship.

Therefore, the need still exists to examine these differences in the parenting experience of mothers and fathers of children with ASD.

Additionally, the current study evidenced relatively low power for examining the relationship of child behavior problems on parental self-efficacy and the relationship of parental depression/anxiety on child behavior problems, indicating the need for more participants. Future research should attempt to secure a larger sample size in order to examine these relationships within this population. On the other hand, several significant mediating relationships were found, despite the low power. This suggests that low power cannot fully explain the lack of other findings in this study.

The current study exhibited a characteristic that may represent an artifact of the sample, and therefore, should be further explored to assess its generalizability. Mothers seemed to evidence an underreporting of depressive/anxiety symptoms. It is unclear why this trend was evident within this sample. It may be explained by services the families are receiving. It could represent methodological issues of social desirability in reporting or self-selection to the study.

Another limitation of the current study is inadequate measurement of some of the study's variables. The Parenting Sense of Competency Scale self-efficacy subscale measures parenting self-efficacy very broadly. Although, parenting self-efficacy was found to partially mediate the relationship between parental stress and parental anxiety/depression, a more direct measurement of parental self-efficacy in response to problems behaviors in children would have provided a more accurate measure of fluctuations in parental self-efficacy in response to the child's behaviors. Also, emotion coaching may not be an accurate measurement of the types of parenting

behaviors that are directly influenced by child behavior problems associated with ASD symptomatology, and likewise, the study did not explore child behaviors and characters that are probably most influenced by parents' emotion coaching behaviors. Including measurement of the child's emotional development would have probably provided a more relevant way in which parent emotion coaching behaviors influence children's behaviors.

Although no significant relationship was found between child's age and the dependent variables in this study, the current study did not examine the potential of the child's age to moderate the relationships examined. It is possible that these relationships would be different across different developmental periods. Similarly, the current study did not examine the potential of the child's ASD diagnosis to moderate the relationships examined. It is possible that these relationships would be different across autism, PDD-NOS and Asperger's Disorder. Future research should examine the potential of these variables as moderators.

The current study used a correlational approach to understanding the relationship of these variables and therefore cannot assert causation or directionality between variables. In other words, the study provides support that self-efficacy partially mediates the relationship between parental stress and parental depression/anxiety, but it cannot assert that parental stress causes decreases in parental self-efficacy which leads to increases in anxiety/depression. Further, the current study is unable to assert directionality of the effect. It is plausible that anxiety/depression decreases parental self-efficacy, which increases parental stress. Future research should attempt to tease apart the directionality of the effect using a longitudinal design. Additionally, the current study did not examine a comprehensive model of parental behaviors and characteristics and child behaviors and characteristics. Therefore, while the current study provides evidence for a potential model of how these variables may interact, it cannot assert that these relationships

would still retain significance when accounting for its relationship to other variables. It is important to note that the current study also did not control for the number of analyses conducted.

#### **4.7 Future Research**

Future research should examine the parenting experiences of fathers to assess whether or not these findings can be generalized to the parenting experience of fathers. It would be helpful to recruit both the mother and father of a child to examine in more detail how these variables effect mothers and fathers while holding child variables constant. The roles of fathers may be different due to a restructuring of roles within the family in order to best accommodate the needs of the child. Using a systemic approach to exploring these differences would be fruitful in understanding how the family dynamics are shaped by the child's disability. In addition, future research should examine if the proposed model (see Figure 5) is supported when the structural relationships of the variables are examined simultaneously, specifically when a Structural Equation Modeling approach is utilized.

Additionally, these variables represent some of the variables that may be important in the ways in which children with ASD and parents of children with ASD may influence each other. Emotion coaching was not found to be influenced by parental characteristics (e.g., parental depression/anxiety). However, other parenting behaviors, such as maternal sensitivity, may be more directly influenced by parenting characteristics. Additionally, conduct problems seemed to influence emotion coaching behaviors in parents. It was found that mothers increased their emotion coaching behaviors in response to the child's conduct problems only when the mother has high self-efficacy. Other parenting behaviors may be found to be more directly related to

symptoms unique to ASD and may provide more direct ways in which child and parent behaviors interact.

One fruitful future step in research should be to examine the longitudinal effect of these variables. Specifically, research should attempt to model the ways in which these variables change over time in relation to one another and their effect on the parent and child. This direction may provide evidence for early risk factors, which may help to educate early intervention practices for parents and families both in term of the parent and the child's behaviors.

#### **4.8 Conclusions**

The current study provides support for the role of parental self-efficacy as a partial mediator between parental stress and parental depression/anxiety, and the role of parental stress as a mediator between child behavior problems and parental self-efficacy. It further suggests that parental self-efficacy is negatively associated with child characteristics (e.g., communication severity) and moderates the relationship between child conduct problems and parental emotion coaching. These findings further knowledge about how ASD symptomatology can affect the parenting experience, particularly in terms of the stress associated with raising a child with ASD and the effect of such stress on decreased parental self-efficacy and increased parental anxiety/depression. Understanding how these variables function and which variables influence parental stress and parental anxiety/depression provides critical information needed in the formation of intervention services for families affected by ASD, implying that services should directly assess and target parental resources/stress, provide parents with skills to increase efficacy, and add interventions for parental mood/anxiety disorders.

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Appendix A

Recruitment Flyer

**If your child has been diagnosed with an  
Autism Spectrum Disorder**

We invite you to participate in SPEAC, the

**Study of Parent Emotions and  
Autism in Children**

**SPEAC is being conducted by the VT Autism Clinic, directed by Dr. Angela Scarpa of the Psychology Department at Virginia Tech. Parents can often be overwhelmed at raising children with special needs, and are often concerned about how their mood affects their child. This project looks at the complex relationship between parental emotions and the behaviors of children with Autism Spectrum Disorders. Parents will be asked to complete questionnaires related to mood, stress, and their child's behaviors. Total time for the study will not exceed 45 minutes, and can be completed at your convenience. To participate in this online anonymous survey, go to [www.\(our link posted here\).](#)**

To learn more or for a mailed copy, please contact the  
Virginia Tech  
Autism Clinic  
3110 Prices Fork Rd.  
Blacksburg, VA 24060  
Email Dr. Scarpa at [autism@vt.edu](mailto:autism@vt.edu)  
Or call (540) 231-2053

## Appendix B

### Demographic Questionnaire

1. Last four digits of phone number: \_\_\_\_\_
2. What relation are you to the child?
  - A. Mother
  - B. Father
  - C. Step Mother
  - D. Step Father
  - E. Adoptive Mother
  - F. Adoptive Father
3. What is your age? \_\_\_\_\_
4. What is your race/ethnicity? (optional)
  - A. African American
  - B. Asian/Pacific Islander
  - C. Native Hawaiian
  - D. Caucasian/European American
  - E. Native American
  - F. Latino, Hispanic or Chicano
5. What is your highest level of completed education? (optional)
  - A. Under \$20,000
  - B. \$20,000-\$39,999
  - C. \$40,000-\$59,999
  - D. \$60,000-\$79,999
  - E. \$80,000-\$99,999
  - F. Over \$100,000
6. What is your child's gender?
  - A. Male
  - B. Female
7. How old is your child?  
Years, Months \_\_\_\_\_
8. What is your child's current Autism Spectrum Disorder diagnosis?
  - A. Autism or Autistic Disorder
  - B. Asperger's Disorder
  - C. Pervasive Developmental Disorder- Not Otherwise Specified (PDD-NOS)
  - D. Other: Please Specify \_\_\_\_\_

9. Has your child been diagnosed with any other disorder?

- A. Yes
- B. No

10. If yes, please specify:

---

11. How old was your child when he/she received this diagnosis?

---

12. Have any of the child's siblings been diagnosed with Autism Spectrum Disorder?

- A. Yes
- B. No

13. If yes, please specify what disorder:

---

## Appendix C

### Severity Score Coding

#### **Communication**

Receptive language delay-Communication

Expressive language delay-Communication

No verbal language-Communication

Apraxia (oral motor, articulation problems)-Communication

Absent or limited gestures-Communication

Echolalia (repeats the same phrase/word over and over)

#### **Reciprocal Social Interaction**

Has trouble joining a group

Happier left alone

Difficulty making friends

Poor eye contact

Doesn't respond when called

Sustained odd play

#### **Stereotyped Behaviors and Restricted Interests**

Hand flapping

Toe walking

Spinning self

Like to watch objects spin

Rhythmic or rocking behaviors

Other types of self-stimulatory behavior (please specify)

Fixation on objects or topics

Hums frequently

**Appendix D**  
**Co-parenting Questionnaire**

**Instructions:** This questionnaire is about how you and your child's other parent work together to parent your child. Please think back over the past several months and circle the most appropriate answer.

1. When you and your child's other parent discuss parenting issues, how often does an argument result?

1 never	2	3	4	5 always
------------	---	---	---	-------------

2. How often is the underlying atmosphere one of hostility and anger?

1 never	2	3	4	5 always
------------	---	---	---	-------------

3. How often is the conversation stressful and tense?

1 never	2	3	4	5 always
------------	---	---	---	-------------

4. Do you and your child's other parent have basic differences of opinion about issues related to child rearing?

1 never	2	3	4	5 always
------------	---	---	---	-------------

5. When you need help regarding the children, do you seek it from your child's other parent?

1 never	2	3	4	5 always
------------	---	---	---	-------------

6. Would you say that your child's other parent is a resource to you in raising the children?

1 never	2	3	4	5 always
------------	---	---	---	-------------

7. Would you say that you are a resource to your child's other parent in raising the children?

1 never	2	3	4	5 always
------------	---	---	---	-------------

8. If your child's other parent has needed to make a change in visiting arrangements, do you go out of your way to accommodate?

1 never	2	3	4	5 always
------------	---	---	---	-------------

9. Does your child's other parent go out of the way to accommodate any changes you need to make?

1 never	2	3	4	5 always
------------	---	---	---	-------------

10. Do you feel that your child's other parent understands and is supportive of your special needs as a parent (custodial or noncustodial)?

1 never	2	3	4	5 always
------------	---	---	---	-------------

**These next questions are about the extent to which the following child-rearing issues have been discussed between you and your child's other parent. Please circle the most appropriate answer.**

1. Discuss school and/or medical problems

1 never	2	3	4	5 always
------------	---	---	---	-------------

2. Discuss children's accomplishments and progress

1 never	2	3	4	5 always
------------	---	---	---	-------------

3. Discuss child-rearing problems

1 never	2	3	4	5 always
------------	---	---	---	-------------

4. Plan special events for the children

1 never	2	3	4	5 always
------------	---	---	---	-------------

5. Discuss personal problems children may be experiencing

1 never	2	3	4	5 always
------------	---	---	---	-------------

6. Discuss major decisions regarding the children's lives

1 never	2	3	4	5 always
------------	---	---	---	-------------

7. Discuss finances in regard to children

1 never	2	3	4	5 always
------------	---	---	---	-------------

8. Discuss problems in coparenting

1 never	2	3	4	5 always
------------	---	---	---	-------------

9. Discuss daily decisions regarding children's lives

1 never	2	3	4	5 always
------------	---	---	---	-------------

10. Discuss children's adjustment to the separation

1 never	2	3	4	5 always
------------	---	---	---	-------------

## Appendix E

### Depression Anxiety Stress Scale (DASS)

<p>Please read each statement and circle a number 0, 1, 2 or 3 that indicates how much the statement applied to you <i>over the past week</i>. There are no right or wrong answers. Do not spend too much time on any statement.</p> <p><i>The rating scale is as follows:</i></p> <p>0 Did not apply to me at all      1 Applied to me to some degree, or some of the time      2 Applied to me to a considerable degree, or a good part of time      3 Applied to me very much, or most of the time</p>					
1	I found myself getting upset by quite trivial things	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I just couldn't seem to get going	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I had a feeling of shakiness (eg, legs going to give way)	0	1	2	3
8	I found it difficult to relax	0	1	2	3
9	I found myself in situations that made me so anxious I was most relieved when they ended	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting upset rather easily	0	1	2	3
12	I felt that I was using a lot of nervous energy	0	1	2	3
13	I felt sad and depressed	0	1	2	3
14	I found myself getting impatient when I was delayed in any way (eg, elevators, traffic lights, being kept waiting)	0	1	2	3
15	I had a feeling of faintness	0	1	2	3
16	I felt that I had lost interest in just about everything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I perspired noticeably (eg, hands sweaty) in the absence of high temperatures or physical exertion	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life wasn't worthwhile	0	1	2	3

*Reminder of rating scale:*

- 0 Did not apply to me at all
- 1 Applied to me to some degree, or some of the time
- 2 Applied to me to a considerable degree, or a good part of time
- 3 Applied to me very much, or most of the time

22	I found it hard to wind down	0    1    2    3
23	I had difficulty in swallowing	0    1    2    3
24	I couldn't seem to get any enjoyment out of the things I did	0    1    2    3
25	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0    1    2    3
26	I felt down-hearted and blue	0    1    2    3
27	I found that I was very irritable	0    1    2    3
28	I felt I was close to panic	0    1    2    3
29	I found it hard to calm down after something upset me	0    1    2    3
30	I feared that I would be "thrown" by some trivial but unfamiliar task	0    1    2    3
31	I was unable to become enthusiastic about anything	0    1    2    3
32	I found it difficult to tolerate interruptions to what I was doing	0    1    2    3
33	I was in a state of nervous tension	0    1    2    3
34	I felt I was pretty worthless	0    1    2    3
35	I was intolerant of anything that kept me from getting on with what I was doing	0    1    2    3
36	I felt terrified	0    1    2    3
37	I could see nothing in the future to be hopeful about	0    1    2    3
38	I felt that life was meaningless	0    1    2    3
39	I found myself getting agitated	0    1    2    3
40	I was worried about situations in which I might panic and make a fool of myself	0    1    2    3
41	I experienced trembling (eg, in the hands)	0    1    2    3
42	I found it difficult to work up the initiative to do things	0    1    2    3

## Appendix F

### Parent Emotional Styles Questionnaire (PESQ)

*Please rate your agreement with each of the following statements on the following scale. Please write your rating in the blank beside each statement.*

1	2	3	4	5
Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree

1. Children really have very little to be sad about.
2. I think that anger is okay as long as it is under control.
3. When my child is sad, it's time to problem-solve.
4. Anger is an emotion worth explaining.
5. When my child is sad, I am expected to fix the world and make it perfect.
6. When my child gets sad, it's time to get close.
7. When my child is sad, I try to help him/her to explore what is making him/her sad.
8. I really have no time for sadness in my life.
9. If you ignore a child's sadness it tends to go away and take care of itself.
10. When my child is sad, I show my child that I understand.
11. I want my child to experience sadness.
12. The important thing is to find out why a child is feeling sad.
13. I think sadness is okay as long as it's under control.
14. Sadness is something that one has to get over, to ride out, not to dwell on.
15. I don't mind dealing with children's sadness, as long as it doesn't last too long.
16. When my child is sad we sit down to talk over the sadness.
17. I prefer a happy child to a child who is overly emotional.

18. I help my child get over sadness quickly so he/she can move on to other things.
19. When my child is sad, I try to help him/her figure out why the feeling is there.
20. When my child is angry, it's an opportunity for getting close.
21. When my child is angry, I take some time to try to experience this feeling with my child.
22. I want my child to experience anger.
23. I don't see a child being sad as any kind of opportunity to teach the child much.
24. I think that when kids are sad they have overemphasized the negative in life.
25. I think it is good for kids to experience anger sometimes.
26. The important thing is to find out why the child is feeling angry.
27. When my child is angry, I try to be understanding of his/her mood.
28. I try to change my child's angry moods into cheerful ones.
29. Children really have very little to be angry about.
30. Childhood is a happy-go-lucky time, not a time for feeling sad or angry.
31. I'm not really trying to teach my child anything in particular about sadness.
32. When my child gets angry I want to know what he/she is thinking.
33. I want my child to get angry, to stand up for him/her/herself.
34. When my child is angry, I want to know what he/she is thinking.
35. I don't make a big deal of a child's anger.
36. When my child is mad, I just find out what is making him/her mad.
37. It's important to help my child find out what caused his/her anger.
38. When my child is angry, I usually don't take it that seriously.
39. When my child gets angry with me, I think "I don't want to hear this."
40. A child's anger is important.
41. When my child is angry, I think "if only he/she could roll with the punches."

42. When my child gets angry, I think “Why can’t he/she accept things as they are?”
43. When my child is angry, it’s time to solve a problem.
44. I don’t make a big deal out of my child’s sadness.
45. Children have the right to feel angry.

## Appendix G

### Strengths and Difficulties Questionnaire (SDQ)

**For each item, please mark Not True, Somewhat True or Certainly True about your child.**

**It would help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of your child's behavior over the last six months.**

1. Considerate of other people's feelings

A. Not True

B. Somewhat True

C. Certainly True

2. Restless, overactive, cannot stay still for long

A. Not True

B. Somewhat True

C. Certainly True

3. Often complains of headaches, stomach-aches or sickness

A. Not True

B. Somewhat True

C. Certainly True

4. Shares readily with other children his/her age, for example toys, treats, pencils, CD's, games, food

A. Not True

B. Somewhat True

C. Certainly True

5. Often loses temper

- A. Not True
- B. Somewhat True
- C. Certainly True

6. Rather solitary, prefers to be/play alone than with other children his/her age

- A. Not True
- B. Somewhat True
- C. Certainly True

7. Generally well behaved, usually does what adults request

- A. Not True
- B. Somewhat True
- C. Certainly True

8. Many worries or often seems worried

- A. Not True
- B. Somewhat True
- C. Certainly True

9. Helpful if someone is hurt, upset or feeling ill

- A. Not True
- B. Somewhat True
- C. Certainly True

10. Constantly fidgeting or squirming

- A. Not True
- B. Somewhat True

C. Certainly True

11. Has at least one good friend

A. Not True

B. Somewhat True

C. Certainly True

12. Often fights with other children his/her own age or bullies them

A. Not True

B. Somewhat True

C. Certainly True

13. Often unhappy, depressed or tearful

A. Not True

B. Somewhat True

C. Certainly True

14. Generally liked by other children his/her own age

A. Not True

B. Somewhat True

C. Certainly True

15. Easily distracted, concentration wonders

A. Not True

B. Somewhat True

C. Certainly True

16. Nervous or clingy in new situations, easily loses confidence

A. Not True

B. Somewhat True

C. Certainly True

17. Kind to younger children

A. Not True

B. Somewhat True

C. Certainly True

18. Often lies or cheats

A. Not True

B. Somewhat True

C. Certainly True

19. Picked on or bullied by other children his/her own age

A. Not True

B. Somewhat True

C. Certainly True

20. Often offers to help others (parents, teachers, other children)

A. Not True

B. Somewhat True

C. Certainly True

21. Thinks things out before acting

A. Not True

B. Somewhat True

C. Certainly True

22. Steals from home, school or elsewhere

- A. Not True
- B. Somewhat True
- C. Certainly True

23. Gets along better with adults than with other children his/her own age

- A. Not True
- B. Somewhat True
- C. Certainly True

24. Many fears, easily scared

- A. Not True
- B. Somewhat True
- C. Certainly True

25. Good attention span, sees chores or homework through to the end

- A. Not True
- B. Somewhat True
- C. Certainly True

## Appendix H

### Parenting Sense of Competence Scale (PSOC)

*Listed below are a number of statements. Please respond to each item, indicating your agreement or disagreement with each statement in the following manner.*

SA	A	MA	MD	D	SD
Strongly agree	Agree	Mildly agree	Mildly disagree	Disagree	Strongly Disagree

1. Most problems of taking care of a child are easy to solve once you know how your actions affect your child, an understanding I have acquired over the years.	SA      A      MA      MD      D      SD
2. Even though being a parent could be rewarding, I am frustrated now while my child is at his/her present age.	SA      A      MA      MD      D      SD
3. I go to bed the same way that I wake up in the morning—feeling I have not accomplished a whole lot.	SA      A      MA      MD      D      SD
4. I do not know what it is, but sometimes when I'm supposed to be in control, I feel more like the one being manipulated.	SA      A      MA      MD      D      SD
5. My mother was better prepared to be a good mother than I am.	SA      A      MA      MD      D      SD
6. I would make a good model for a new mother to follow in order to learn what she would need to know in order to be a good parent.	SA      A      MA      MD      D      SD
7. Being a parent is manageable, and most problems are easily solved.	SA      A      MA      MD      D      SD
8. A difficult problem in being a parent is not knowing whether you're doing a good job or a bad one.	SA      A      MA      MD      D      SD
9. Sometimes I feel like I'm not getting anything done.	SA      A      MA      MD      D      SD

10. I meet my own personal expectations for the way in which I am caring for my child.	SA	A	MA	MD	D	SD
11. If anyone can find out what is troubling my child, I believe I am the one who can.	SA	A	MA	MD	D	SD
12. My talents and interests are in areas other than being a parent.	SA	A	MA	MD	D	SD
13. Considering how long I've been a mother, I feel very familiar with this role.	SA	A	MA	MD	D	SD
14. If being a mother were more interesting, I would be more motivated to be a better parent.	SA	A	MA	MD	D	SD
15. I believe that I have all the skills necessary to be a good mother to my child.	SA	A	MA	MD	D	SD
16. Being a parent makes me tense and nervous.	SA	A	MA	MD	D	SD

## Appendix I

### Questionnaire on Resources and Stress-Short Form

This questionnaire deals with your feelings about your child with Autism Spectrum Disorder. There are many blanks on the questionnaire. Imagine the child's name filled in on each blank. Give your honest feelings and opinions. Please answer all of the questions, even if they do not seem to apply. If it is difficult to decide True (T) or False (F), answer in terms of what you or your family feel or do MOST OF THE TIME. Sometimes the questions refer to problems your family does not have. Nevertheless, they can be answered True or False, even then. Please begin. Remember to answer all of the questions.

1. \_\_\_\_\_ doesn't communicate with others of his/her age group.
2. Other members of the family have to do without things because of \_\_\_\_\_.
3. Our family agrees on important matters.
4. I worry about what will happen to \_\_\_\_\_ when I can no longer take care of him/her.
5. The constant demands for care for \_\_\_\_\_ limit growth and development of someone else in our family.
6. \_\_\_\_\_ is limited in the kind of work he/she can do to make a living.
7. I have accepted the fact that \_\_\_\_\_ might have to live out his/her life in some special setting (e.g., institution or group home).
8. \_\_\_\_\_ can feed himself/herself.
9. I have given up things I have really wanted to do in order to care for \_\_\_\_\_.
10. \_\_\_\_\_ is able to fit into the family social group.
11. Sometimes, I avoid taking \_\_\_\_\_ out in public.
12. In the future, our family's social life will suffer because of increased responsibilities and financial stress.

13. It bothers me that \_\_\_\_\_ will always be this way.
14. I feel tense whenever I take \_\_\_\_\_ out in public.
15. I can go visit with friends whenever I want.
16. Taking \_\_\_\_\_ on a vacation spoils pleasure for the whole family.
17. \_\_\_\_\_ knows his/her own address.
18. The family does as many things together now as we ever did.
19. \_\_\_\_\_ is aware who he/she is.
20. I get upset with the way my life is going.
21. Sometimes I feel embarrassed because of \_\_\_\_\_.
22. \_\_\_\_\_ doesn't do as much as he/she should be able to do.
23. It is difficult to communicate with \_\_\_\_\_ because he/she has difficulty understanding what is being said to him/her.
24. There are many places where we can enjoy ourselves as a family when \_\_\_\_\_ comes along.
25. \_\_\_\_\_ is over-protected.
26. \_\_\_\_\_ is able to take part in games or sports.
27. \_\_\_\_\_ has too much time on his/her hands.
28. I am disappointed that \_\_\_\_\_ does not lead a normal life.
29. Time drags for \_\_\_\_\_, especially free time.
30. \_\_\_\_\_ can't pay attention very long.
31. It is easy for me to relax.
32. I worry what will be done with \_\_\_\_\_ when he/she gets older.
33. I get almost too tired to enjoy myself.
34. One of the things I appreciate about \_\_\_\_\_ is his/her confidence.
35. There is a lot of anger and resentment in our family.
36. \_\_\_\_\_ is able to go to the bathroom alone.

37. \_\_\_\_\_ cannot remember what he/she says from one moment to the next.
38. \_\_\_\_\_ can ride a bus.
39. It is easy to communicate with \_\_\_\_\_.
40. The constant demands to care for \_\_\_\_\_ limit my growth and development.
41. \_\_\_\_\_ accepts himself/herself as a person.
42. I feel sad when I think of \_\_\_\_\_.
43. I often worry about what will happen to \_\_\_\_\_ when I no longer can take care of him/her.
44. People can't understand what \_\_\_\_\_ tries to say.
45. Caring for \_\_\_\_\_ puts a strain on me.
46. Members of our family get to do the same kinds of things other families do.
47. \_\_\_\_\_ will always be a problem to us.
48. \_\_\_\_\_ is able to express his/her feelings to others.
49. \_\_\_\_\_ has to use a bedpan or a diaper.
50. I rarely feel blue.
51. I am worried much of the time.
52. \_\_\_\_\_ can walk without help.

## Appendix J

### Consent/Information Form

Dear family member of a person with Autism Spectrum Disorder,

You are invited to participate in a research study conducted through the Virginia Tech Autism Clinic in the Department of Psychology at Virginia Tech. Parents of a child between the ages of 3 through 16, with a diagnosed Autism Spectrum Disorder (ASD), are invited to participate. By ASD, we mean Autism, Asperger's Disorder, or Pervasive Developmental Disorder – Not Otherwise Specified. The study aims to assess parental emotions such as anxiety, stress, and depressed mood that may be related to parenting a child with an ASD. The surveys related to the study will not exceed 45 minutes. Participants will not be excluded based upon race or gender.

#### II. Procedures

You are asked to complete four surveys that will ask you about your current level of stress, depressed and anxious moods, and ways that you and your child address emotions. The purpose of these questionnaires is to further understand feelings such as anxiety, stress, and depressed mood that could be related to your child's difficult behaviors. For example, some parents worry that their own negative moods can impact their child's behavior. Other parents report that the demands of raising a child with an ASD increase their stress levels and depressed mood. This study is trying to better understand these relationships. After filling out the questionnaires about yourself, you will be asked to complete another survey of your child's behaviors.

#### III. Risks

There is no more than minimal risk associated with this research project. The researchers do not believe that the surveys are anxiety provoking, but if you do feel uncomfortable while filling them out, you are free to withdraw from the study at any time with no penalties.

If you feel that you need to talk to a professional about your stress, anxiety, depressed mood, or

issues with your child's behavior, you can contact Virginia Tech's Psychological Services Center at (231-7201). In addition, the Mental Health Association of the New River Valley provides lists of private mental health providers. The website for this is: <http://www.mhanrv.org/>

#### IV. Benefits of this Project

The benefit of this project will be a societal benefit of increasing the understanding of the relationship between parent emotions and child behavior in youth with ASDs. Note that there is no guarantee of benefits made to encourage you to participate. Your participation is completely voluntary.

#### V. Extent of Anonymity and Confidentiality

No identifying information will be collected during this study, and we can not refer any of this information back to you. Any information obtained during this research will be kept confidential. Only designated research personnel will have access to this information. Results may be published or presented for scientific purposes, but your identity will not be revealed in any description or publication of this research.

#### VI. Compensation

There is not monetary compensation associated with this study.

#### VII. Freedom to Withdraw

You are free to withdraw from this study at any time without penalty. You have the right to refuse to answer any questions or respond to any part of this study, and there would be no penalty.

#### VIII. Approval of Research

This project has been approved, as required by the Institutional Review Board for Research Involving Human Subjects, the Department of Psychology at Virginia Polytechnic Institute and

State University, and the VT Autism Clinic.

**IX. Participant's Responsibilities**

I voluntarily agree to participate in this study. My responsibilities are to fill out the surveys.

**X. Permission**

I have read and understand this information sheet and conditions of this research study, or it has been read to me, and I understand its contents. I understand that I may withdraw from participation at any time without penalty. By completing these surveys, I am providing my consent to participate.

Should I have any questions about this study, I may contact:

Dr. Angela Scarpa, Investigator, Department of Psychology 231-2615

Dr. D.W. Harrison, Psychology Human Subjects Committee 231-4422

Dr. David M. Moore, Chair, IRB, Research Division 231-4991

Thank you again for your time and effort. The information you provide is helpful in understanding the emotional effects of parenting a child with Austim Spectrum Disorder.

Sincerely, Virginia Tech Autism Research Group

### Footnotes

1. A majority of the parents were Caucasian (94.2%), followed by African-American (2.2%), Latino (1.4%), Native American (1.4%) and Asian/Island Pacificer (.7%). Based on the small sample size of non-Caucasian mothers, it was not appropriate to assess if race had a systematic effect on the dependent variables using ANOVA. Therefore, to explore potential differences of Caucasian and non-Caucasian mothers, separate regression analyses were conducted for Caucasian mothers and Caucasian and non-Caucasian mothers. Results of the regressions indicated similar patterns; therefore, mothers were collapsed across race.
2. Due to the lack of normality of the depression/anxiety variable, analyses were also conducted with the bootstrap method, as outlined by Preacher and Hayes (2004). This statistical method does not have an underlying assumption of normality. The results remained the same, lending further support of the original results. Therefore, the original OLS results were retained and are reported in the text.

Table 1.

## Intercorrelations of Primary Variables of Interest

	<i>DASS-DA</i>	<i>SDQ</i>	<i>PSOC-SE</i>	<i>PESQ-EC</i>	<i>QRS</i>	<i>Severity</i>	<i>CP1</i>	<i>CP2</i>
<i>DASS-DA</i>	.062	-.38**	.12	.50**	.03	-.10	.07	
<i>SDQ</i>		-.02	-.07	.27**	.21*	-.12	.157	
<i>PSOC-SE</i>			.01	-.17*	-.18*	-.02	.04	
<i>PESQ-EC</i>				-.06	.09	.06	.10	
<i>QRS</i>					.12	-.06	-.09	
<i>Severity</i>						-.15	.002	
<i>CP1</i>							.697**	
<i>CP2</i>								

\* significant at .05 level

\*\*significant at .01 level

Measure Abbreviations  
 PSOC-SE=Self-efficacy  
 PESQ-EC= Emotion Coaching  
 QRS= Parental Stress  
 DASS-DA= Depression/Anxiety  
 CP1= Co-parenting 1  
 CP2= Co-parenting 2

Table 2.

Series of Regression Analyses for Parenting Stress as a mediator Child Behavior Problems and Parental Self-Efficacy

Mediation Regression Steps	Predictors	R2	Adjusted R2	Model p	F	B	$\beta$	t
Step 1 (predicting parental self- efficacy)	Child Behavior Problems	.025	.017	.035	3.36	-.083	-.157	-1.83*
Step 2 (predicting parenting stress)	Parent Age Child Diag. Child Behavior Problems	.137	.118	.0005	6.96	.227	.237	2.90**
Step 3 (predicting parental self- efficacy)	Parent Age Child Diag. Parenting Stress	.082	.061	.006	3.86	-.120	-.217	-2.48**
Step 4 (predicting parental self- efficacy)	Parent Age Child Diag. 1) Child Behavior Problems 2) Parenting Stress	.090	.062	.008	3.20	-.051 -.106	-.096 -.191	-1.09 -2.11*

\*significant at .05 level

\*\*significant at .01 level

Note: Parent age and the child's Autism Spectrum Diagnosis were entered into the equations as control variables for steps using Parental Stress based on the aforementioned ANOVA and correlation (i.e., Steps 2, 3 and 4).

Table 3.

## Analysis of Self-Efficacy as a mediator between Parental Stress and Parental Depression/Anxiety

Regressions	Predictors	R2	Adjusted R2	F	Model p	B	$\beta$	t
Step 1 (predicting depression/anxiety)	Parental Age Child Diag. Parental Stress	.223	.204	11.75	.0005	.038	.463	5.56 **
Step 2 (predicting parental self-efficacy)	Parental Age Child Diag. Parental Stress	.082	.061	3.86	.006	-.120	-.217	-2.48 **
Step 3 (predicting depression/anxiety)	Parental Self-Efficacy	.093	.086	12.79	.0005	-.045	-.306	-3.58 **
Step 4 (predicting depression/anxiety)	Parental Age Child Diag. 1)Parental Stress 2)Parental Self-Efficacy	.277	.253	11.59	.0005	.033 -.039	.41 -.26	4.93 ** -3.26 **

\*significant at .05 level

\*\*significant at .01 level

Note: Parent age and the child's Autism Spectrum Diagnosis were entered into the equations as control variables for steps using Parental Stress based on the aforementioned ANOVA and correlation.

Table 4.

Analysis of Emotion Coaching as a mediator between Anxiety/Depression and Child Behavior Problems

Regressions	Predictors	R2	Adjusted R2	F	Model p	B	$\beta$	t
Step 1 (predicting child behavior problems)	Anxiety/ Depression	.101	-.014	.48	.331	.714	.056	.693

Note: Regressions were not conducted beyond step 1 because child behavior problems were not found to relate to parental anxiety/depression.

**Table 5.**  
Intercorrelations of Subscores and Composite Scores

	SDQ Conduct	SDQ_ Emotional Symptoms	SDQ Hyper- activity	SDQ Peer Prob.	PSOC- SE	Comm. Sev.	Social Sev.	Repetitive Sev.	QRS	DASS- DA
SDQ_ Conduct	.35**	.38**	.04	-.15	.25*	.40**	.26**	.02	.07	
SDQ Emot.		.10	.20*	-.10	-.18*	.21*	.01	.16	.16	
SDQ Hyper.			-.03	-.12	.07	.06	.31**	.17*	.21*	
SDQ- Peer Prob.					.11	.56**	-.002	.15	.05	
PSOC- SE						-.21*	-.09	-.09	-.02	-.38**
Comm. Sev.							.32**	.26**	.05	.003
Social Sev.								.23**	.13	.06
Repet. Sev.									.04	.17
QRS										.50**
DASS- DA										
PESQ- EC										

\* significant at .05 level

\*\*significant at .01 level

Measure Abbreviations  
 PSOC-SE=Self-efficacy  
 QRS= Parental Stress  
 DASS-DA= Depression/Anxiety

Table 6.

Intercorrelations of Subscores and Composite Scores cont.

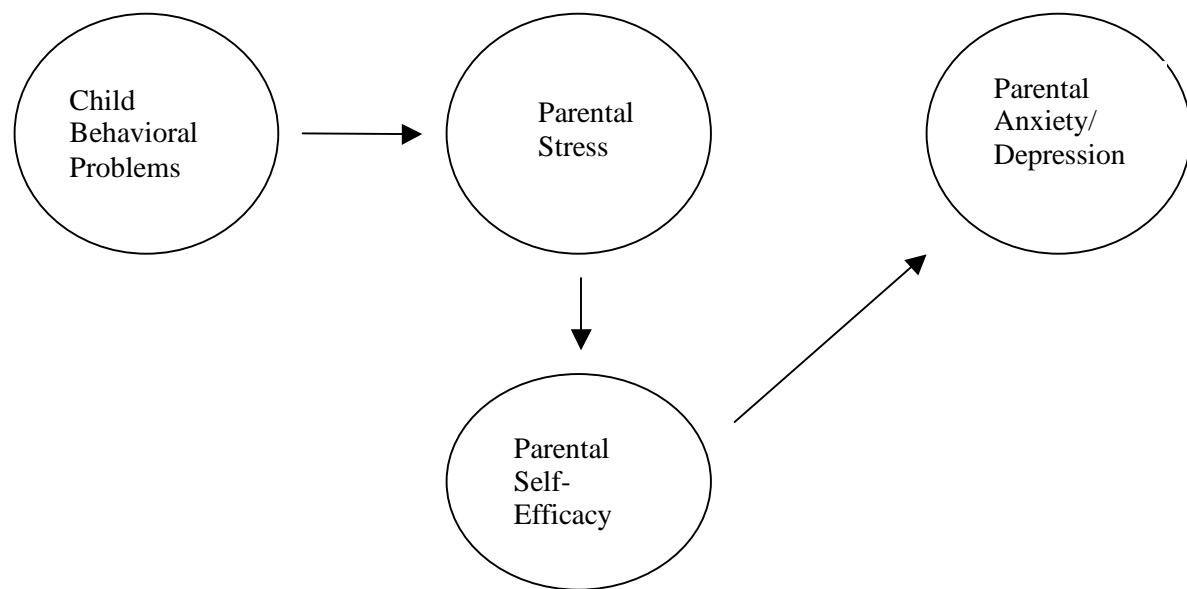
	Coparenting 1	Coparenting 2	PESQ-ED	PESQ-EC
Coparenting 1				
Coparenting 2		.697**		
PESQ-ED	-.04	-.08		
PESQ-EC	.60	.10	.36**	
SDQ-Conduct	-.15	-.20*	-.19*	-.228*
SDQ-Emotional Symptoms	-.08	-.17	-.10*	-.031
SDQ-Hyperactivity	-.02	-.005	-.06	.058
SDQ-Peer Problems	-.06	.06	-.03	-.008
PSOC-SE	-.02	.04	-.06	.01
QRS	-.06	-.09	.13	-.06
DASS-DA	-.10	.07	-.002	.12
Communication Severity	-.04	.08	.000	.069
Social Severity	-.19*	-.08	-.11	.075
Repetitive Severity	-.10	.007	.17*	.044

\* significant at .05 level

\*\*significant at .01 level

Measure Abbreviations  
 PSOC-SE=Self-efficacy  
 PESQ-ED= Emotion Dismissive  
 PESQ-EC= Emotion Coaching  
 QRS= Parental Stress  
 DASS-DA= Depression/Anxiety

Figure 1. Child Influences on the Mother.



*Figure 2.* Maternal Influences on the Child.

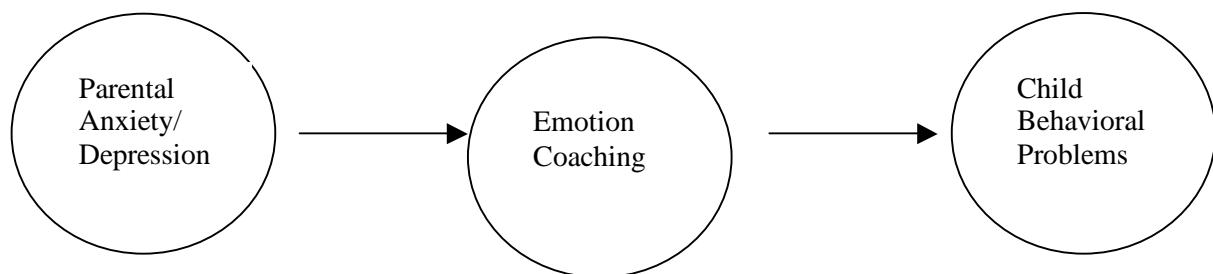


Figure 3. Graph of emotion coaching on conduct problems at three values of parental self-efficacy.

### Emotion Coaching on Child Conduct Problems at Three Values of Parental Self Efficacy

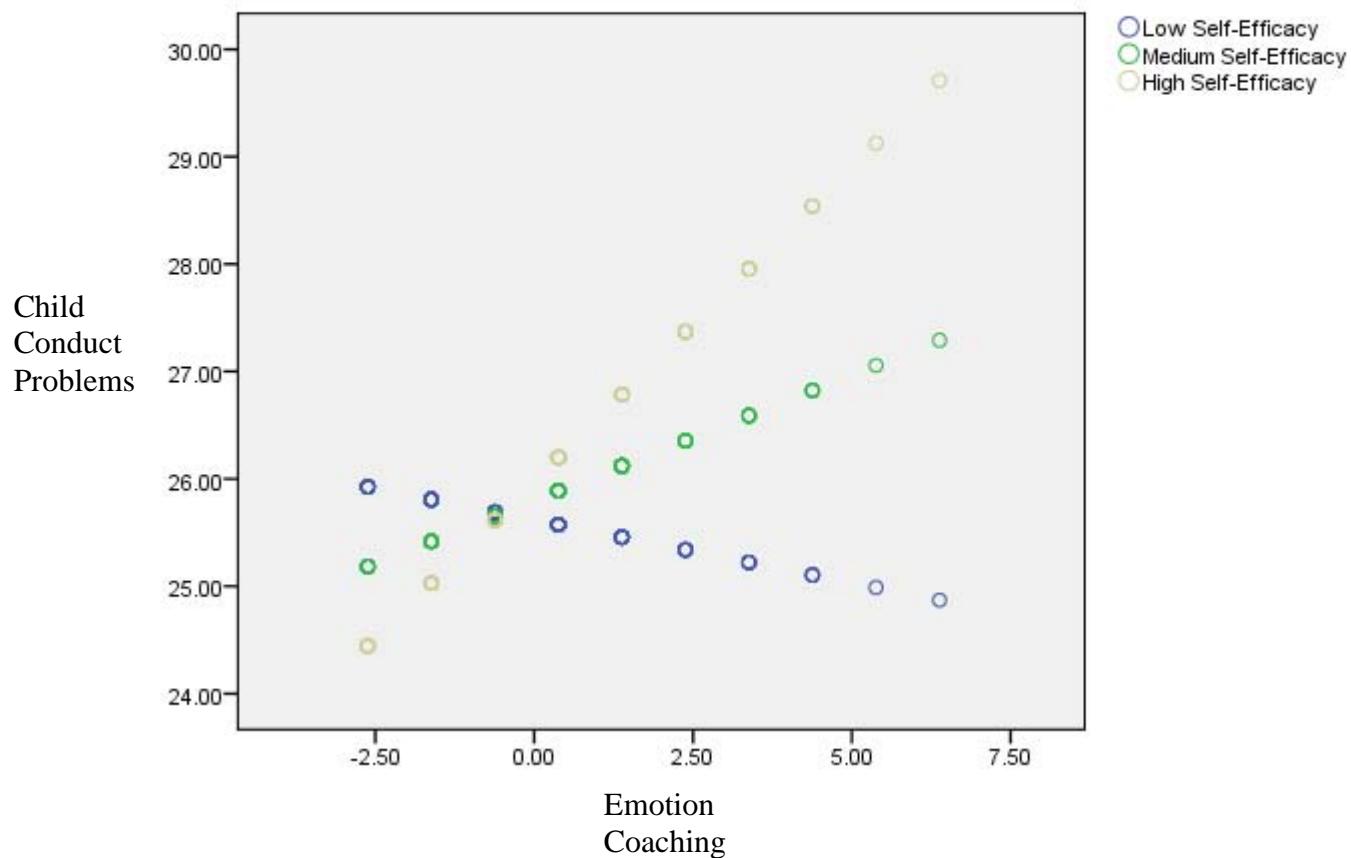


Figure 4. Potential Comprehensive Model

