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# Parent Stress and Social Skills Development in Children with Developmental Delays

Andrea Lewallen

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LOMA LINDA UNIVERSITY  
School of Behavioral Health  
in conjunction with the  
Faculty of Graduate Studies

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Parent Stress and Social Skills Development in Children with Developmental Delays

by

Andrea Lewallen

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A Dissertation submitted in partial satisfaction of  
the requirements for the degree  
Doctor of Philosophy in Clinical Psychology

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September 2015

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

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# CONTENT

Approval Page.....	iii
Acknowledgements.....	iv
List of Figures.....	ix
List of Tables.....	x
List of Abbreviations.....	xi
Abstract.....	xii
Chapter	
1. Overview of Two Studies.....	1
Method for Study One and Study Two.....	2
Participants.....	2
Study One.....	3
Study Two.....	6
Procedure.....	9
2. Study One: Improved Social Skills in Children with Developmental Delays following Parent Participation in MBSR.....	12
Abstract.....	12
Introduction.....	13
Parenting Stress in Families of Children with Developmental Delays.....	14
Significant Elevations in Parenting Stress.....	14
Negative Outcomes of Parenting Stress.....	15
The Impact of Stress on Parenting Style and the Parent-Child Relationship.....	17
The Impact of the Parent-Child Relationship on Child Social Development.....	18
Interventions Targeting Parenting Stress.....	19

Mindful-Parenting Interventions.....	19
Mindfulness-Based Stress Reduction .....	20
Study One Method .....	21
Measures .....	22
Demographic Data .....	22
Parenting Relationship Questionnaire.....	23
Social Skills Improvement System .....	23
Results.....	23
Preliminary Analyses .....	24
Child Social Skills Outcomes .....	26
Parent-Child Relational Factors .....	28
Child-Self Control and Related Changes in Parent-Child Relational Factors .....	28
Discussion.....	31
3. Study Two: Changes in Parenting Behavior After Parent Stress Reduction; A Pathway to Gains in Child Self-Control .....	38
Abstract.....	38
Introduction.....	39
The Impact of Stress on Parenting Processes .....	41
The Impact of Stress on Parent-Child Relationships .....	41
The Impact of Strained Parent-Child Relationships on Parenting Behavior.....	42
The Impact of Parenting Processes on Child Social Development.....	43
Parent Behaviors that Impact Child Self-Regulation.....	43
Parental Sensitivity .....	44
Parental Intrusiveness .....	45
Parental Scaffolding.....	46
Child Self-Regulation as a Pathway to Social Competence .....	47
Reducing Parental Stress to Improve Parenting Processes .....	48
Aims and Hypotheses .....	50
Aim One.....	51
Aim Two.....	51

Study Two Method .....	53
Measures .....	53
Demographic Data .....	53
Parenting Relationship Questionnaire.....	53
Social Skills Improvement System .....	53
Clean-up Task Coding Manual .....	54
Time-Interval Coding of Maternal Discipline .....	54
Global Codes of Maternal Control.....	55
Time-Interval Coding of Child Compliance .....	56
Calculating Time-Segmented Scores .....	57
Dysregulation Coding System .....	58
Emotion Dysregulation .....	58
Behavior Dysregulation .....	59
Reliability of Observational Measures.....	59
Data Analysis .....	59
Parent-Child Relational and Social Skills Variables .....	60
Parenting Behavior Variables .....	60
Child Self-Regulation Variables .....	62
Results.....	62
Changes in Variables Across the Intervention.....	62
The Parent-Child Relationship as a Predictor of Parenting Behavior .....	65
Post-Hoc Analysis.....	67
Parenting Behavior as a Predictor of Child Self-Regulation and Compliance .....	67
Child Self-Regulation and Compliance as Predictors of Self- Control .....	70
Discussion .....	72
Pathway From the Parent-Child Relationship to Parenting Behavior .....	72
Pathway From Parenting Behavior to Child Self-Regulation.....	74
Pathway From Child Self-Regulation to Social Self-Control.....	76



Limitations and Implications for Future Research.....	78
Conclusions and Implications for Clinical Practice.....	79
4. Dissertation Conclusion.....	81
References.....	82

## FIGURES

Figures	Page
1. Hypothesized pathway model illustrating a possible mechanism by which the parent-child relationship may ultimately impact child self-control through parenting behavior and child self-regulation. ....	52

## TABLES

Tables	Page
1. Study One Demographic Characteristics .....	5
2. Means (SDs) of sample child social skill at intake compared with SSIS norms.....	8
3. Changes in child social skills and parent-child relational factors after parent participation in MBSR .....	25
4. Final models of child self-control regressed onto parent-child relational factors (N = 24).....	27
5. Study Two Demographic Characteristics .....	30
6. Correlations among Parenting Behavior Variables.....	61
7. Changes in Parent-Child Relational Factors, Parenting Behaviors, and Child Self-Control.....	64
8. Pathway from the Parent-Child Relationship to Parenting Behavior .....	66
9. Pathway from Parenting Behavior to Child Self-Regulation.....	69
10. Pathway from Child Self-Regulation to Child Self-Control.....	71

## ABBREVIATIONS

DD	Developmental Delays
ICC	Intraclass Correlation Coefficient
MBSR	Mindfulness Based Stress Reduction
PRQ	Parenting Relationship Questionnaire
SSIS	Social Skills Improvement System
TD	Typically Developing

## ABSTRACT OF THE DISSERTATION

Parent Stress and Social Skills Development in Children with Developmental Delays

by

Andrea Lewallen

Doctor of Philosophy, Graduate Program in Clinical Psychology

Loma Linda University, September 2015

Dr. Cameron L. Neece, Chairperson

The following dissertation is a compilation of two studies examining the impact of Mindfulness Based Stress Reduction (MBSR) on parents of children with developmental delays (DD) and the subsequent effects on child social development. Study one sought to examine whether changes in child social skills occurred after parent stress was reduced through an 8-week MBSR training group, and whether these changes were associated with improvements in parent-child relational factors. Data from 24 families of children with DD (ages 2.5-5) were examined in this study. Paired samples *t*-tests examining pre-post differences revealed that mothers, secondary informants, and teachers acknowledged improvements in child self-control. Variance in child self-control was significantly accounted for by changes in two parent-child relational factors: attachment and discipline practices. Study two expounded on these results by investigating the mechanisms through which parent-child relationships impact child self-control. A proposed pathway model explaining these relationships suggests that parent-child relationships impact parenting behaviors that promote child self-regulation, subsequently improving child self-control. A total of 23 parents were included in study two analyses. Parents were filmed at three time points while engaging in a parent-child

clean-up task during laboratory assessments. Hierarchical regressions revealed that neither attachment nor discipline practices predicted changes in parenting behavior at post-treatment nor follow-up. However parenting frustration was associated with reduced intrusiveness. In addition, greater maternal scaffolding and lower intrusiveness were associated with increased compliance and reduced non-compliance. Children who were non-compliant by means of overt-resistance tended to have greater parent-reported self-control. Although contradictory to our expectations, behaviors associated with overt-resistance may be considered adaptive and self-regulatory when expressed in peer-conflict situations, but considered non-compliant and thereby less adaptive during parent-child interactions. Children with DD may have difficulty differentiating appropriate behaviors based on social contexts, causing them to be non-compliant with parents, while exhibiting appropriately regulated assertiveness with peers. Overall, these studies support the importance of addressing parenting stress when targeting child social development. By targeting parenting stress, parents may experience lower frustration in the parent-child relationship resulting in improved parenting behaviors that promote child self-regulation.

## **CHAPTER ONE**

### **OVERVIEW OF TWO STUDIES**

Parents of children with developmental delays (DD) report significantly higher levels of parenting stress than parents of children that are typically developing (TD) (Baker et al., 2003; Baxter, Cummins, & Yiolitis, 2000; Emerson, 2003; Hauser-Cram et al., 2001; Neece, Green, & Baker, 2012; Webster, Majnemer, Platt, & Shevell, 2008). In addition to the extensive detrimental effects of stress on parents' mental health (Anastopoulos, Guevremont, Shelton, & DuPaul, 1992; Deater-Deckard et al., 1998; Hastings, Daley, Burns, & Beck, 2006), elevated parenting stress also predicts poor psychosocial outcomes in children (Baker et al., 2003; Neece et al., 2012; Donenberg & Baker, 1993; Johnson & Mash 2001). Furthermore, the relationship between childhood problems and parenting stress is most likely bidirectional, in which higher parenting stress leads to greater child behavior problems, which continue to exacerbate parental stress in turn (Baker et al., 2003; Neece et al., 2012; Orsmond, Seltzer, Krauss, & Hong, 2003). This negative cyclical relationship is especially relevant to families of children with DD, whose parents are not only more likely to experience clinical levels of stress, but their children are inherently at a greater risk for problematic behavioral and social development (Merrell & Holland, 1997). Children with DD are at particularly greater risk for developing poor social competence, a crucial skillset that allows children to engage in prosocial problem solving strategies and protects against further maladjustment (Fenning, Baker, & Juvonen, 2011; Downey & Coyne, 1990). By addressing parental stress early on, parent-child relationship and parenting behaviors may be positively impacted in a way that promotes healthier social development among children with DD. These

improvements may then subsequently reduce parental stress as the child continues to develop.

Interventions targeting social and/or behavioral problems in children rarely intervene directly with parent stress. While most interventions attempt to break the negative cycle between stress and childhood problems by intervening with the child, interventions that primarily target parental stress may prove to be an additionally effective means of improving childhood outcomes (Neece, 2013). The current dissertation is composed of two studies that examine the impact of parent participation in Mindfulness Based Stress Reduction (MBSR) on the social development of children with DD. The purpose of study one is to examine whether changes in child social skills occur after parent stress is reduced through an eight-week MBSR training group, and whether these changes are associated with improvements in parent-child relational factors. The purpose of study two is to expand on the result of study one, by exploring possible mechanisms through which parent-child relationships impact child social development.

## **Method for Study One and Study Two**

### ***Participants***

The current study involved parents who participated in the Mindfulness Awareness for Parenting Stress Program, which included parents of children ages 2.5 to 5 years old with DD. Participants were primarily recruited through the Inland Regional Center located in Southern California, although some were recruited through the local newspaper, local elementary schools, and community disability groups. In California, practically all families of individuals with DD receive services from one of nine Regional Centers. Families who met the inclusion criteria were selected by the Regional Center's



computer databases and received a letter and brochure informing them of the study. Information about the study was also posted on a website which allowed interested parents to submit their information.

Criteria for inclusion in the study were: (1) Having a child ages 2.5 to 5 years, (2) child was determined by Regional Center (or by an independent assessment) to have a DD, (3) mothers reported more than 10 child behavior problems (the recommended cutoff score for determining risk of conduct problems) on the Eyberg Child Behavior Inventory (ECBI; Robinson, Eyberg, & Ross, 1980), (4) the parent was not receiving any form of psychological or behavioral treatment at the time of referral (e.g., counseling, parent training, parent support group, etc.), (5) parent agreed to participate in the intervention, and (6) parent spoke and understood English. Exclusion criteria included parents of children with debilitating physical disabilities or severe intellectual impairments that prevented the child from participating in a parent-child interaction task that was a part of the larger laboratory assessment protocol (e.g., child was not ambulatory). In order to be included, parents must also have completed all initial measures and attended the initial assessment before the beginning of the first intervention session.

### **Study One**

Of the 95 families that were screened for the study, 63 were determined to be eligible, and 51 parents elected to participate in the intervention. Within participating families, primary and secondary informants were identified. The primary informants were all mothers who each participated in the laboratory assessments. The secondary

informants were primarily fathers, with the exception of one grandfather. During the initial assessment, primary informants (from hereon referred to as “mothers”) were invited to bring the secondary informant from their family to participate in the intervention as well. Eleven secondary informants chose to participate in the intervention, and were excluded from any analyses that utilized data reported from mothers, so as to not include children twice in any analysis. Of the remaining participating mothers, five completed the initial assessments but dropped out of the study before the intervention, two participated in the study but did not return pre-treatment measures in time, ten did not return post-treatment data in time, and one did not provide complete data for the measures relevant to this study. This left 24 mothers who provided complete data for the measures included in this study. There were no demographic differences between participants who completed the intervention and those who dropped out of the study, nor were there differences between participants who turned in completed data versus those who did not complete the measures relevant to this study.

Table 1 depicts the demographics of the current sample. The majority of children were boys (66.7%) and Hispanic (37.8%). Parents reported 33.3% of the children as Caucasian, 8.3% as Asian, and 20.8% as “Other.” The mean age of the children was 3.4 years, with a standard deviation of 0.82. Most of the participating parents were married (79.2%). Families reported a range of annual incomes, with 50% reporting an annual income of more than \$50,000, but incomes ranged from \$0 to over \$95,000. The average number of years parents completed in school was 15.0 years, with a standard deviation of 2.6.

**Table 1.** Study One Demographic Characteristics

---

<b>Child Characteristics</b>	
Gender (% Boys)	66.7%
Age, M(SD)	3.4(.82)
Ethnicity (% Caucasian)	33.3%
<b>Mother Characteristics</b>	
Age, M(SD)	36(8.0)
Marital Status (% Married)	79.2%
Years of Education, M(SD)	15(2.6)
Family Income (% > \$50,000)	50%

---

*Note: N = 24 children*

According to the Gilliam Autism Rating Scale-Second Edition (Gilliam, 2006), 83.3% of the children in our sample had a “very likely” diagnosis of autism. At the time of the initial assessment, 92% of the children were reported to receive special education services in school and 83% of the children were enrolled in a special education classroom. Although not formally assessed, the majority of children were estimated to have intellectual functioning no lower than a mild to moderate range of intellectual disability given the demands of the laboratory assessment. Children had to understand and follow directions in a structured play task in order to be eligible for the study.

## **Study Two**

With the families identified in study one, a total of 110 parent-child interaction tasks were completed and filmed across three time points. Only videos that captured interactions at pre-treatment, post-treatment, and follow up were included for analyses. As the greater MAPS Project study was conducted using a randomized controlled trial design, 17 interactions that were collected for control purposes using a wait-listed group were excluded from analyses. This allowed us to combine the treatment and waitlist groups to examine changes before and after treatment in order to maximize statistical power. Of the 93 remaining videos, ten were lost due to equipment malfunction, leaving 83 valid parent-child interactions across three time points (34 pre-treatment videos, 27 post-treatment videos, and 22 follow-up videos). However, since analyses were all longitudinal, participants who did not have interactions filmed for more than one time point were also excluded. This left 23 parent-child dyads with videos at pre and post treatment. Three of these parents were lost to follow up, leaving 20 parent-child dyads for

analyses comparing pre-treatment to six-month follow up. Lastly, two of the pathways analyzed in this study looked at video data and pencil and paper measures simultaneously. For these analyses, total N was 19 at post treatment, and 17 at six-month follow-up, which included families who had both sets of data.

Table 2 depicts the demographics of the 23 participants with completed video data. The majority of children were boys (63.6%) and Hispanic (27.3%). Parents reported 36.4% of the children as Caucasian, 9.1% as Asian, and 27.3% as “Other.” The mean age of the children was 3.4 years, with a standard deviation of 0.91. Most of the participating parents were married (77.3%). Families reported a range of annual incomes, with 45.5% reporting an annual income of less than \$50,000, but incomes ranged from \$0 to over \$95,000. The average number of years parents completed in school was 15.3 years, with a standard deviation of 2.6.

According to the Gilliam Autism Rating Scale-Second Edition (Gilliam, 2006), 60.9% of the children in our sample had a “very likely” diagnosis of autism. At the time of the initial assessment, 87.0% of the children were reported to receive special education services in school and 78.3% of the children were enrolled in a special education classroom. Although not formally assessed, the majority of children were estimated to have intellectual functioning no lower than a mild to moderate range of intellectual disability given the demands of the laboratory assessment. Children had to understand and follow directions in a structured play task in order to be eligible for the study.

**Table 2.** Study Two Demographic Characteristics

---

<b>Child Characteristics</b>	
Gender (% Boys)	63.6%
Age, M(SD)	3.4(.91)
Ethnicity (% Caucasian)	36.4%
<b>Mother Characteristics</b>	
Age, M(SD)	36(8.0)
Marital Status (% Married)	77.3%
Years of Education, M(SD)	15.3(2.6)
Family Income (% > \$50,000)	45.5%

---

*Note: N = 23 children*

### *Procedure*

Institutional review board approval was obtained for the protection of human subjects prior to commencing this intervention study. Interested parents contacted the Mindful Awareness for Parenting Stress Program by phone, postcard, or submitting their information on the project website. Study personnel then conducted a phone screen to determine the eligibility of the parent. If the parent met inclusion criteria, an intake laboratory assessment was scheduled. Prior to the initial assessment, parents were mailed a packet of questionnaires to be completed by mothers before arriving at the lab assessment. During the lab assessment, the mothers completed the informed consent and were interviewed to collect demographic information, including information on the child's school of attendance and current teacher. This information was used to mail an additional packet with two questionnaires to be completed and returned by the child's teacher. Finally, mothers drew a piece of paper out of a box which informed them of whether they were assigned to the immediate treatment or waitlist-control intervention group. In addition, a secondary informant of each child completed a packet of measures. For the purposes of achieving sufficient power the experimental design was not utilized in the current study. Given that both groups eventually received treatment, data from the immediate treatment and waitlist-control were combined to achieve a sample size of 24. Power analysis indicated that 25 people were needed in order to have an 80% power to detect a large effect size ( $f^2 = .35$ ) from pre to post treatment, which is consistent with the effect sizes observed in this study.

Parents assigned to the immediate treatment group began the intervention in March 2012 and parents assigned to the control group began the intervention in June

2012. The eight-week Mindfulness Based Stress Reduction (MBSR) intervention followed the manual outlined by Dr. Jon Kabat-Zinn at the University of Massachusetts Medical Center (Blacker, Meleo-Meyer, Kabat-Zinn, & Santorelli, 2009; Kabat-Zinn, 1992). This intervention consisted of three main components: (1) didactic material covering the concept of mindfulness, the psychology and physiology of stress and anxiety, and ways in which mindfulness can be implemented in everyday life to facilitate more adaptive responses to challenges and distress; (2) mindfulness exercises during the group meetings and as homework between sessions; and (3) discussion and sharing in pairs and in the larger group. The MBSR program included eight weekly 2-hour sessions, a daylong 6-hour meditation retreat after session 6, and daily home practice based on audio CDs with instruction. Formal mindfulness exercises included the body scan, sitting meditation with awareness of breath, and mindful movement. The instructor for the group had over 20 years experience practicing mindfulness and teaching MBSR, had completed the Advanced MBSR Teacher Training at the University of Massachusetts Medical Center, and had received supervision with Senior MBSR teachers through the Center for Mindfulness at the University of Massachusetts Medical Center. While parents participated in the MBSR intervention, trained doctoral students specializing in child clinical psychology from the university provided childcare, but no intervention was delivered.

Participants were paid a total of \$25-\$35 (depending on whether they were assigned to the treatment group or control group, which required an additional laboratory visit) for completion of questionnaires and lab assessments, to compensate them for their time and in an effort to minimize attrition. Other benefits to participants included paid



parking during lab assessments, childcare provided during weekly intervention group meetings, access to specialists in child development, the opportunity to learn more about their children's abilities across various situations, a feedback report on their child's behavioral development after the end of the intervention, and emailed links to community mindfulness opportunities and resources to reinforce ongoing practice after program completion.

## CHAPTER TWO

### STUDY ONE: IMPROVED SOCIAL SKILLS IN CHILDREN WITH DEVELOPMENTAL DELAYS AFTER PARENT PARTICIPATION IN MBSR

#### Abstract

Parents of children with developmental delays (DD) often report significantly heightened levels of stress when compared to families of typically developing (TD) children. While elevated levels of early parenting stress are shown to negatively impact social development in TD children, this effect may be compounded for children with DD, who are already at greater risk of experiencing social difficulties. We sought to examine whether changes in child social skills occur after parent participation in a Mindfulness Based Stress Reduction (MBSR) intervention, and whether these changes were associated with parent-child relational factors. Parental stress was reduced through an eight-week MBSR training group. Changes in child social skills were measured using the Social Skills Improvement System (SSIS), which was completed by 3 respondents: parents participating in the study, a secondary informant, and the child's teacher. Parent-child relational factors were measured using the Parenting Relationship Questionnaire (PRQ). Data from 24 families of children with DD (ages 2.5-5) was examined in this study. Paired samples t-tests examining pre-post differences revealed that mothers, secondary informants, and teachers acknowledged improvements in child self-control. Mothers and teachers also reported improvements in empathy and engagement, while secondary informants and teachers reported improvements in child assertion. Teachers also reported improvements in children's communication, responsibility, and cooperation. Variance in child self-control was significantly accounted for by changes in two parent-child

relational factors: attachment and discipline practices. These results suggest that addressing parental mental health may enhance the efficacy of child-focused interventions by promoting parental consistency in discipline and perceived attachment (i.e. parent-child closeness).

## **Introduction**

Parents of children with developmental delays (DD) consistently report higher levels of parenting stress when compared to parents of typically developing (TD) children (Baker et al., 2003; Baxter, Cummins, & Yiolitis, 2000; Emerson, 2003; Hauser-Cram et al., 2001; Neece, Green, & Baker, 2012; Webster, Majnemer, Platt, & Shevell, 2008). High levels of parenting stress are not only associated with negative psychological outcomes for parents (Anastopoulos, Guevremont, Shelton, & DuPaul, 1992; Deater-Deckard et al., 1998; Hastings, Daley, Burns, & Beck, 2006), but often lead to poor child outcomes as well. Evidence also suggests that the relationship between childhood problems and parenting stress is bidirectional, such that higher parenting stress leads to greater child behavior problems, which in turn continue to exacerbate parental stress over time (Baker et al., 2003; Neece et al., 2012; Orsmond, Seltzer, Krauss, & Hong, 2003). The impact of parental stress on childhood problems is especially concerning in families of children with DD, as these children are inherently more vulnerable to poorer behavioral and social outcomes (Merrell & Holland, 1997). In particular, children with DD are at significantly greater risk for developing poor social competence, a crucial skillset that allows children to engage in prosocial problem solving strategies and protects against further maladjustment (Fenning, Baker, & Juvonen, 2011; Downey & Coyne, 1990). Addressing parental stress early on is likely to promote healthier social

development among children with DD, which may subsequently reduce parental stress as the child continues to develop. However, interventions aimed at improving childhood problems seldom address parental stress. While most interventions attempt to break the negative cycle between stress and childhood problems by intervening directly with the child, interventions that primarily target parental stress may prove to be an additionally effective means of improving childhood outcomes (Neece, 2013). The purpose of the current study is to explore how an MBSR intervention for parents of children with DD impacts child social skills, and to examine possible parent-child relational variables that may be associated with changes in social skills.

### *Parenting Stress in Families of Children with Developmental Delays*

#### **Significant Elevations in Parenting Stress**

As mentioned above, we chose to focus our study on parents of children with DD, as this population reports alarming levels of parental stress, with nearly a third of parents scoring in the clinical range (Davis & Carter, 2008). Stress levels among parents of children with DD are consistently higher than those experienced by parents of TD children (Baker et al., 2003; Baxter, Cummins, & Yiolitis, 2000; Emerson, 2003; Hauser-Cram et al., 2001; Webster, Majnemer, Platt, & Shevell, 2008), with parents of children with Autism Spectrum Disorders (ASD) reporting the highest levels of stress overall (Blacher & McIntyre, 2006; Eisenhower et al., 2005; Estes et al., 2009; Pisula, 2007; Sanders & Morgan, 1997). Although there is some evidence that stress experienced by parents of children with DD can be chronic, there is marked individual variation in its trajectory over the life course (Glidden & Schoolcraft, 2003). Parents of children with

DD often experience a wide range of additional stressors such as low levels of parenting confidence (Liu, Chen, Yeh, & Hsieh, 2012; Fonseca, Nazaré, & Canavarro, 2013; Sepa, Frodi, & Ludvigsson, 2004), which can impact parents' emotional well-being, hinder their adjustment to the parenting role, and decrease overall parental effectiveness (Jones & Prinz, 2005). Additionally, children with DD experience significantly higher levels of behavior problems when compared to TD children, and these problems (rather than intellectual delays) are the primary source of child-related stress in the family (Baker et al., 2002; Beck et al., 2004; Hassall, Rose, & McDonald, 2005; Hastings, 2003). However, the influence of child behavior problems on parenting stress decreases with child age, while difficulties in child social skills exhibit greater contributions to parenting stress as the child develops (Neece & Baker, 2008).

### **Negative Outcomes of Parenting Stress**

Not surprisingly, high levels of stress are associated with several negative outcomes for both parents and their children. For example, highly stressed parents are significantly more vulnerable to parental depression (Anastopoulos, Guevremont, Shelton, & DuPaul, 1992; Deater-Deckard et al., 1998; Hastings, Daley, Burns, & Beck, 2006), marital conflict (Kersh, Hedvat, Hauser-Cram, Warfield, 2006; Suarez & Baker, 1997), poorer physical health (Eisenhower, Baker, & Blacher, 2009; Oelofsen & Richardson, 2006), and less effective parenting (Crnic, Gaze, & Hoffman, 2005; Coldwell, Pike, & Dunn, 2006). Similarly, the children of highly stressed parents commonly experience poor psychosocial health (Webster et al., 2008), increased child behavior problems (Baker et al., 2003; Briggs-Gowan et al., 2001; Donenberg & Baker,

1993; Johnson & Mash 2001; Neece, Green, & Baker, 2012) and of most importance to this study, lower social competence (Neece & Baker, 2008; Anthony et al., 2005; Guralnick et al., 2003).

These negative parent and child outcomes are likely to interact within the bidirectional relationship between parental stress and childhood outcomes. As parents experience the weight of their stress, their child's behavior problems become more pronounced, further exacerbating a parent's stress (Baker et al., 2003; Neece et al., 2012; Orsmond, Seltzer, Krauss, & Hong, 2003). This creates a negative and self-perpetuating cycle that continues over time. Given the bidirectional relationship occurring between parent and child maladjustment, it is reasonable to suspect that the parent-child relationship plays a critical mediating role through which parental stress influences child behavioral and social development. For example, high levels of parenting stress may impact the development of parent-child closeness and attachment. While risk factors such as DD may not directly interfere with parent-child closeness (Hoffman, Sweeney, Hodge, Lopez-Wagner, & Looney, 2009), parenting stress can promote insecure attachment between the parent and child, as predicted by psychological distance rather than physical separation (Jarvis & Creasey, 1991). Stress induced decreases in maternal sensitivity may also disrupt the parent-child relationship. Reciprocal give-and-take between mother and child is a critical attribute of sensitivity, promoting child comfort, child-mother attachment, and overall child development (Shin, Park, Ryu, & Seomun, 2008). Kim and Kim (2009) found that poor psychological status in mothers had a negative effect on maternal sensitivity, which in turn, had a negative effect on attachment. Ruptures in parent-child attachment may further impact the relationship by increasing stress related to

the maternal role (Teti, Nakagawa, Das, & Wirth, 1991). These effects may then be further exacerbated by mothers' tendencies to perceive insecurely attached children as less adaptable and rewarding.

### ***The Impact of Stress on Parenting Style and the Parent-Child Relationship***

High levels of stress that promote poor parent-child relationships are likely to result in less effective parenting styles and behaviors as well. As a result, authoritarian parenting styles that are more negative and controlling are common among the highly stressed parents of children with DD (Woolfson & Grant, 2006). These styles are more likely to negatively affect social-cognitive processes that are critical for peer-related social competence (Guralnick, 1999). While limit setting is necessary for social development (Lengua 2011), parent-child relational factors that are shown to promote greater social competence are often tied to more positive interactions that include positive parent affect, less harsh discipline (Green & Baker, 2011), sensitive-parenting (Barnett et al., 2012) and calm discussion (Pettite, Bates, & Dodge, 1997). Hart (1992) illustrated this concept by demonstrating that children of less inductive (less power assertive) parents exhibited fewer disruptive playground behaviors, more prosocial behaviors, and were more preferred by their peers. Fostering foundational emotionally positive parent-child relationships early on can set the stage for parent-child interactions that promote prosocial problem solving skills as children develop. In fact, as children grow into middle childhood, their ability to independently engage in emotional discourse with their parents is associated with greater prosocial problem solving strategies, and in turn, more adaptive

social skills outcomes regardless of the presence of a DD (Fenning, Baker, & Juvonen, 2011).

### ***The Impact of the Parent-Child Relationship on Child Social Development***

Negative parent-child relationships characterized by poor and harsh parenting practices may detrimentally impact children with DD to a greater extent than TD children. Because psychopathology develops as a product of bidirectional interactions between individual and environmental factors (Sameroff, 2009), families coping with the additional stressors associated with individual risk, such as DD and intellectual disability (ID), play a particularly important role in providing an environment that can either intensify risk or serve a protective function (Sameroff et al., 1998). For example, Green and Baker (2011) found that parents' negative affect predicted significantly lower social skills for children with ID than for children with TD. While children with DD are at an increased vulnerability for numerous childhood problems, the impact of poor parent-child relationships on social development is especially concerning, since social competence is among one of the most important aspects of individual development, with social skills providing a critical protective factor against further maladjustment (Downey and Coyne, 1990; Fenning, Baker, & Juvonen, 2011). Evidence demonstrating the heightened burden of parental stress associated with parenting a child with DD, along with the additional risk that parental stress imparts on the child's social development, demonstrates the importance of directly and primarily targeting parental stress in hopes of enhancing the parent-child relationship and improving child social competence.



### *Interventions Targeting Parenting Stress*

Fortunately, there is evidence supporting the efficacy of interventions aimed at reducing parental stress. In their review of stress reduction interventions for parents of children with DD, Hastings and Beck (2004) found support for the use of standard service models such as respite care and case management, as well as growing evidence for parent-led support networks. The strongest identified evidence-base was for cognitive behavioral group interventions. However, Hastings and Beck (2004) acknowledged the lack of data available for other theoretical approaches to stress reduction, and encouraged growth in this area of research in order to strengthen the evidence-base for possible alternative models.

### **Mindful-Parenting Interventions**

One alternative model of stress reduction that has gained growing support in the literature is mindfulness-based intervention. Given the prominent surge of interest in treatments incorporating the practice of mindfulness (Allen, Blashki, & Gullon, 2006; Baer, 2008), it is not surprising that various “mindful-parenting” interventions have been evaluated with the often highly stressed parents of children with DD (Bazzano et al., 2010; Benn, Akiva, Arel, & Roeser, 2012). Mindfulness may help parents achieve a more relaxed and peaceful state of mind, which can promote greater awareness during parent-child interactions. As a result, parents might become better listeners to their children, as well as more aware of impulses, allowing them to achieve a greater sense of control during interactions. Interventions promoting mindful parenting have been used with both TD children with externalizing behavior problems as well as children with Autism

Spectrum Disorders (Singh et al., 2006) and found to be effective in reducing children's externalizing behavior and attention problems as well as improving children's self-control, compliance, and attunement to others (Bögels et al., 2008; Singh et al., 2010a, 2010b). "Mindful parenting" interventions focus directly on the parent-child relationship by teaching parents to identify interactions that result in relational disconnectedness (Placone-Willey, 2002). While recent studies demonstrate promising results of parent mindfulness training, these studies are limited by small sample sizes and lack of randomization to treatment conditions, indicating a need for further research in this area.

### **Mindfulness-Based Stress Reduction**

In contrast to mindful parenting interventions, MBSR focuses directly on parents' personal stress without providing additional training on applying mindful skills to parent-child interactions. Training is completed through an eight-week manualized stress reduction intervention delivered in a group format. Participants learn to manage stress by enhancing personal awareness on a moment-to-moment basis using several techniques including exercising awareness of physical sensations and cognitions, breathing exercises, meditation, and yoga. MBSR is supported by over two decades of extensive research showing its effectiveness in reducing stress, anxiety, and depression, as well as promoting overall well-being (Chiesa & Serretti, 2009). Previous studies indicate that the majority of people who complete the 8-week MBSR program report experiencing a greater ability to cope more effectively with both short- and long-term stressful situations, a critical skill for parents of children with DD. MBSR may also help to

improve the parenting experience by teaching parents to increase awareness and appreciation during pleasant interactions with their children.

To date, one study has evaluated MBSR as an intervention for parenting stress specifically (Neece, 2013), and found MBSR to be efficacious in reducing overall parenting stress in parents of children with DD. Parents who participated in this study reported significantly less stress and depression as well as greater life satisfaction compared to waitlist-control parents. Additionally, children whose parents participated in MBSR were reported to have fewer behavior problems following the intervention, specifically in the areas of attention problems and ADHD symptomatology. Although previous studies have found “mindful parenting” interventions to be effective in reducing children’s externalizing behaviors by teaching mindfulness skills that were directly applied to parent-child interactions (Bögels et al., 2008; Singh et al., 2010), the results of the Neece (2013) study importantly demonstrated that treatments focused on parent stress alone may have an indirect “spillover effect” on the child. However, changes in social skills have yet to be examined. Furthermore, while the author suggested that changes in parenting behavior and parent-child relationships are likely responsible for positive outcomes in children, these potential mediating factors have not been examined empirically.

### **Study One Method**

Given that children with DD experience significantly greater social deficits than TD children (Merrell & Holland, 1997), the small number of studies examining the relationship between parent-child relational factors and social competence is concerning.

In light of previous research, studies that explore the complex associations between parental stress, parent-child relationships, and child social skill development are necessary in order to better understand the roles of contextual factors in social development and further inform the development of efficacious interventions for both parents and their children. We aimed to contribute to this gap in the literature by examining the impact of parental stress reduction on child social skills and parent-child relational factors, as well as how the latter two variables relate to each other over time.

Stress was significantly reduced through parent participation in an 8-week MBSR intervention. This was accomplished in the Neece (2013) study, which used the same sample as the current study. We anticipated that in addition to reducing stress, parents would significantly improve in several parent-child relational factors, including discipline practices, attachment, communication, involvement, and relationship frustration. We also expected that children would demonstrate significant improvements in social skills from pre to post treatment including communication, empathy, cooperation, assertion, responsibility, engagement, and self-control. Lastly, we hypothesized that changes in parent-child relational factors would predict changes in child social skills.

### *Measures*

#### **Demographic Data**

Demographic data were collected during an interview with the participating parent.

### **Parenting Relationship Questionnaire (PRQ)**

The Parenting Relationship Questionnaire (PRQ; Kamphaus & Reynolds, 2006) is a 45-item scale designed to assess the relationship between the primary caregiver and his or her child. The scale measures this construct through seven subscales including attachment, discipline practices, involvement, parenting confidence, and relational frustration. Parents respond to the questions on the PRQ using a Likert type scale from Never (1) to Almost Always (4) (PRQ; Kamphaus & Reynolds, 2006). Cronbach's alpha was calculated for each scale for the current sample and ranged from .62 to .85 ( $M = .75$ ).

### **Social Skills Improvement System (SSIS)**

Child social skills were assessed by mothers, secondary informants and teachers report using the Parent and Teacher forms of the Social Skills Improvement System (SSIS, Gresham & Elliott, 2008) rating scales, respectively. The SSIS is a widely used 79-item questionnaire that has adequate reliability and validity, and provides a broad assessment of child social skills, problem behaviors and academic competence for children. The present study examined seven child social skills sub-scales in this measure including communication, cooperation, self-control, responsibility, empathy, engagement, and assertion. Internal consistency reliability for this sample was .87.

## **Results**

The distributions of the primary variables were examined at both pre and post-treatment. As suggested by Cohen, Cohen, West and Aiken (2002), data points that were more than three standard deviations above or below the mean of a variable were

considered to be outliers. None were identified. Additionally, demographic variables listed in Table 1 that had a significant relationship ( $p < .05$ ) with one or more of the independent variables *and* one or more of the dependent variables were tested as covariates in the analyses. No positive demographic covariates were identified.

### *Preliminary Analyses*

At intake, the mean scores on the self-control, empathy, and engagement subscales were below average when compared to the normative sample of the SSIS. Children in the current sample scored one standard deviation below the norm sample on self-control, as well as two standard deviations below the norm sample on empathy and engagement. Participant scores were fairly consistent with the norm subsample of children with DD (within one standard deviation of norm means on all seven social skills measured), which included kids ages 3-5 with global developmental delays (Gresham & Elliot, 2008). See Table 3.

Regarding the parent-child relationship at intake, parents tended to score within the average range in discipline practices (mean  $T$ -score = 44, 30<sup>th</sup> percentile), attachment (mean  $T$  = 42, 20<sup>th</sup> percentile) and involvement (mean  $T$  = 44, 29<sup>th</sup> percentile). Scores were lower in parenting confidence (mean  $T$  = 36, 9<sup>th</sup> percentile) and higher in relationship frustration (mean  $T$  = 63, 92<sup>nd</sup> percentile), based on PRQ norms (Kamphaus & Reynolds, 2006).

**Table 3.** Means (SDs) of sample child social skill at intake compared with SSIS norms

Social Skill	Sample	Norm Sample	Norm Subsample with DD
Self-control	5.9(3.4)	11(3.3)	7.4(5.2)
Communication	9.4(3.6)	15.3(3.3)	7.2(5.1)
Cooperation	8.4(2.7)	12.1(3.1)	7.6(4.3)
Assertion	7.2(3.3)	14.7(3.9)	6.4(4.6)
Responsibility	5.9(2.8)	11.4(3.5)	6.9(4.9)
Empathy	6.1(4.0)	13.3(3.1)	8.0(5.6)
Engagement	6.6(3.8)	15.4(3.9)	6.8(5.7)

### *Child Social Skills Outcomes*

Paired samples *t*-tests were conducted to detect changes in child social skills after parents received the MBSR intervention. Mothers, secondary informants, and teachers each reported significant improvements across several social skills subscales. All three reporters acknowledged improvements in child self-control. In addition to child self-control, mothers reported improvements in empathy and engagement, while secondary informants reported improvements in assertion. Interestingly, among the three reporters, teachers reported the highest number of changes in child social skills. Teacher reports were consistent with mothers, demonstrating improvements in empathy and engagement, as well as consistent with secondary informants demonstrating improvements in assertion. Furthermore, teacher reports showed significant improvements in communication, responsibility, and cooperation. Lastly, teacher data showed significant improvements in the overall social skill standard score provided by the SSIS and composed of all subscales (pre-treatment  $M = 70.83$ ( $SD = 12.646$ ), post-treatment  $M = 78.72$ ( $SD = 12.953$ ),  $t(17) = -4.717$ ,  $p < .001$ ). The effect size for this difference was large ( $d = .97$ ). Both mothers and teachers reported medium sized changes in child self-control, according to Cohen's conventions (Cohen, 1988) (mothers,  $d = .54$ ; teachers,  $d = .59$ ), and secondary informants reported smaller changes ( $d = .36$ ). Effect sizes for the remaining changes in child social skills ranged from small to large. See Table 4 for summary



**Table 4.** Changes in child social skills and parent-child relational factors after parent participation in MBSR

Social Skills	Participating Parent				Secondary Informant				Teacher			
	Pre-tx (SD)	Post-tx (SD)	<i>t</i>	<i>d</i>	Pre-tx (SD)	Post-tx (SD)	<i>t</i>	<i>d</i>	Pre-tx (SD)	Post-tx (SD)	<i>t</i>	<i>d</i>
Self-control	5.9 (3.4)	7.5(3.6)	2.61*	.54	4.2(4.1)	6.4(3.6)	2.61*	.36	6.6(4.5)	8.0(4.7)	2.60*	.59
Communication	9.4(3.6)	9.2(4.6)	.382	.03	8.0(4.3)	8.6(4.1)	0.51	.10	7.1(3.8)	9.6(3.8)	3.57**	.83
Cooperation	9.4(3.6)	9.2(4.6)	.382	.03	8.2(3.0)	8.7(2.6)	0.98	.12	9.4(3.2)	11.3(2.0)	3.23**	.75
Assertion	7.2(3.3)	8.4(3.7)	1.71	.24	5.5(3.9)	7.7(3.3)	3.09**	.74	4.3(3.2)	5.6(3.6)	2.06*	.48
Responsibility	5.9(2.8)	6.8(4.0)	1.58	.18	5.4(3.7)	6.3(2.9)	1.11	.19	7.2(4.1)	8.8(4.4)	2.56*	.58
Empathy	6.1(4.0)	7.6(4.5)	3.12**	.61	5.5(3.4)	6.9(3.8)	1.74	.27	5.1(4.0)	7.0(3.8)	2.45*	.58
Engagement	6.6(3.8)	8.5(4.8)	-2.63*	.61	5.5(4.5)	6.7(4.5)	1.29	.19	6.8(3.0)	8.7(3.6)	3.57**	.82
<b>PRQ variables</b>												
Involvement	12.9(4.0)	14.2(4.1)	-1.48	.23								
Relationship Frustration	10.5(3.1)	8.4(3.3)	3.47**	.48								
Parenting Confidence	11.2(2.4)	12.6(3.1)	-2.16*	.37								
Attachment	20.9(4.6)	21.4(4.5)	-0.53	.08								
Discipline Practices	14.8(5.7)	15.3(6.1)	-.77	.06								

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

### ***Parent-Child Relational Factors***

Additional paired sample *t*-tests revealed significant changes across two parent-relational factors: relationship frustration (pre-treatment  $M = 10.5$ ( $SD = 3.1$ ), post-treatment  $M = 8.4$ ( $SD = 3.3$ ),  $t(23) = 3.47$ ,  $p = .002$ ,  $d = .48$ ), and parenting confidence (pre-treatment  $M = 11.2$ ( $SD = 2.4$ ), post-treatment  $M = 12.6$ ( $SD = 3.1$ ),  $t(23) = -2.16$ ,  $p = .042$ ,  $d = .37$ ). In addition, a small to medium effect size was observed for changes in involvement ( $d = .31$ ), along with small effect sizes for changes in attachment ( $d = .10$ ) and discipline practices ( $d = .12$ ). However, the changes in these parent-child relational factors were not statistically significant.

### **Child Self-Control and Related Changes in Parent-Child Relational Factors**

Based on the results of the *t*-tests reported above, five linear hierarchical regressions were run to examine how changes in child self-control related to changes that occurred across each of the parent-child relational factors. The child social skill variable self-control was selected for analysis due to the consistency of reports from mothers, secondary informants, and teachers who all independently reported significant improvements in this skill from pre to post treatment. Each regression included the post-treatment self-control score as the dependent variable. The pre-treatment self-control score was then entered in the first step of the analysis as a covariate. In the second step, the pre-treatment score for one of the five parent-child relational factors was entered. The third and final step of each regression included the post-treatment score for the parent-child relational factor of interest, allowing each parent-child relational factor to be examined as an independent variable. By controlling for pre-treatment levels of each

variable we were able to examine how changes in child self-control were related to parent-child relational factors. Of these regressions, two were significant. Increases in attachment and consistent discipline practices were significantly associated with increases in child self-control, ( $\beta = .338, t(3, 20) = 2.12, p = .047$ ) as well as increases in consistent discipline practices ( $\beta = .675, t(3, 20) = 2.64, p = .016$ ). See Table 5.

**Table 5.** Final models of child self-control regressed onto parent-child relational factors (N = 24)

	B	SE B	$\beta$
<b>IV: Discipline Practices</b>			
Step 1: Pre-Tx Self-Control	.742	.165	.709***
Step 2: Pre-Tx Discipline Practices	-.384	.165	-.613*
Step 3: Post-Tx Discipline Practices	.401	.152	.675**
<b>IV: Attachment</b>			
Step 1: Pre-Tx Self-Control	.917	.165	.877***
Step 2: Pre-Tx Attachment	-.480	.139	-.620**
Step 3: Post-Tx Attachment	.271	.128	.338*
<b>IV: Relationship Frustration</b>			
Step 1: Pre-Tx Self-Control	.687	.200	.657**
Step 2: Pre-Tx Relationship Frustration	.110	.274	.096
Step 3: Post-Tx Relationship Frustration	-.041	.249	-.037
<b>IV: Involvement</b>			
Step 1: Pre-Tx Self-control	.575	.190	.550**
Step 2: Pre-Tx Involvement	.062	.179	.069
Step 3: Post-Tx Involvement	-.247	.172	-.284
<b>IV: Parenting Confidence</b>			
Step 1: Pre-Tx Self-control	.965	.215	.923***
Step 2: Pre-Tx Parenting Confidence	-.747	.329	-.493*
Step 3: Post-Tx Parenting Confidence	.204	.191	.178

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

## Discussion

The current study investigated the impact of MBSR for parents on the development of social skills in children with DD. To the author's knowledge, this is the first study to examine how reductions in parental stress may "spill over" to improve child social skills development with this population. Parents who received the intervention reported significant reductions in parental stress and depression, improvements in their general life satisfaction, and subsequent reductions in child behavior problems (Neece, 2013). The current study expanded on the results of Neece (2013), finding that parents who received MBSR also observed collateral gain in their child's social skills, including self-control, assertion, empathy, and engagement. Specifically, improvements in self-control were noted across three independent reporters, highlighting the salience of these changes across multiple observers and environments. Furthermore, it appears that improvements in child self-control are positively associated with changes in parental reports of consistent discipline practices and feelings of attachment. Although significant changes were observed for relationship frustration and parenting confidence, these changes were not associated with changes in child self-control. Furthermore, several parent-child relational factors (attachment, discipline practices, and involvement) were within average ranges at baseline, suggesting that parents were already reporting relatively appropriate parent-child relational functioning resulting in a possible ceiling effect for changes in these factors. However, some improvements did occur and that these changes were significantly associated with improvements in child self-control. It is possible that the lack of significance observed for these changes was due to

underpowered analyses. As a result, clearer differences might be observed if this study were replicated with a larger sample.

Consistent with previous findings (Neece, 2013), results indicate that MBSR is not only effective in improving a range of parental mental health outcomes, but may also have an additional positive impact on childhood outcomes. These results continue to support past research regarding the impact of interventions promoting mindful parenting on various childhood gains such as improved compliance in children with ADHD (Singh et al., 2010); reduced aggression, non-compliance, and self-injury in children with autism (Singh et al., 2006; Singh et al., 2007); and increased positive social interactions in children with DD (Singh et al., 2007). The current study builds upon these previous findings, identifying self-control in particular as a key variable that is not only improved with parent mindfulness training, but may also be a primary contributor to improvements in several of the areas identified above. Poor self-control is highly pertinent to the behavioral and emotional difficulties commonly experienced by children with delays, as this skill is directly related to a child's ability to regulate his or her own emotional and behavioral responses in social situations. Children with DD are far more likely to exhibit poor emotional self-regulation (Wilson et al., 2007), placing them at heightened risk for behavior dysregulation, as seen in higher levels of aggressive behavior (Bohnert, Crnic, & Lim, 2003). Parent-child interactions that teach self-control not only promote skills that are necessary for positive social outcomes, such as behavior regulation, but can have more general and lasting positive effects as well. For example, greater self-control in childhood is related to cognitive and attentional competencies that can enhance academic

achievement, and is also predictive of a greater ability to cope with frustration and stress in adolescence (Shoda, Mischelle, & Peake, 1990).

Increased self-control was associated with increases in parent-reported attachment. As defined in the PRQ, attachment refers to “the affective, cognitive, and behavioral relationship between a parent and child that results in feelings of closeness, empathy, and understanding on the part of the parent for the child” (PRQ; Kamphaus & Reynolds, 2006). Improvements in a parent’s feelings of closeness and empathy toward his or her child may lead to significant gains in child self-control, with increased positivity in parent-child interactions acting as a possible mediator. Specifically, parents who feel especially close with their child may express these feelings through more positive parenting behaviors with their child. Parents might demonstrate greater attunement to their child by anticipating needs and addressing them early on before the child becomes excessively frustrated, and provide greater positive reinforcements for good behavior. In turn, these parenting behaviors are likely to increase the child’s engagement with the parent and ultimately his or her motivation to self-regulate, thereby improving self-control.

Mindful techniques may play an additional role in increasing positive parenting behaviors during parent-child interactions. Mindfulness training is shown to enhance a participant’s ability to engage in positive reappraisal, which Garland, Gaylord, and Park (2009) argue is a critical mechanism of action underlying the therapeutic efficacy of mindful interventions. Positive reappraisal as an active, meaning-based coping mechanism can enhance parents’ adaptability to stressful situations, and imbue difficult parent-child interactions with positive meaning. This form of coping is shown to increase

positive affect (Garland et al., 2009), which may further promote more positive parenting behaviors during interactions with their children, thereby enhancing parent-child closeness. In addition, using positive-reappraisal through mindfulness is likely to heighten parental awareness of positive child qualities during interactions, resulting in more frequent and consistent positive reinforcement for adaptive behaviors. This in turn may lead to more positive behavioral contingencies on the part of the parent, resulting in additional child gains in positive self-regulation strategies and ultimately self-control.

In addition to being associated with greater attachment, increased self-control was associated with an increased consistency in parental discipline practices. This result is in line with previous research demonstrating that consistent discipline promotes healthier socio-emotional and behavioral development in children (Nieman et al., 2004; Pfiffner et al., 2005; Yamagata et al., 2013). By remaining consistent in their limit setting, parents teach children that specific problem behaviors will always lead to undesirable consequences, whereas refraining from problem behaviors will prevent negative consequences. As the child learns that his or her ability to self-regulate results in predictable positive or negative changes in the parent-child interaction (i.e., the parents' behavior through implementation of consequences and/or child's experience of consequence), the child's sense of self-control is likely to increase. Furthermore, parents who adopt mindful techniques in their parenting style may be more prone to increasing positive interactions through positive reappraisal as mentioned above. Singh and colleagues (2010) suggested that parents of children at risk for greater non-compliance are more likely to employ external control strategies in order to improve child compliance. In doing so, the child is less likely to practice internal strategies of control,



and less likely to have positive interactions with parents. This effect may be compounded for children with DD who are at greater risk for noncompliance (Baker et al., 2003; Donenberg & Baker, 1993; Johnson & Mash 2001; Neece et al., 2012), and whose parents often experience heightened levels of stress that place them at a greater risk for applying external control strategies such as those common in harsh authoritarian parenting styles (Woolfson & Grant, 2006). Our results show that parents can optimize their child's ability to practice self-control by engaging in more positive parenting (increasing a sense of attachment to their child) as well as maintaining consistent discipline through limit setting and predictable consequences.

The current findings must be considered within the context of several study limitations. First the sample size was small, limiting our ability to detect smaller effects that may be present. In addition, our findings relied solely on parent-report data to measure parent-child relational variables and reporting biases may have influenced results. Although the use of teacher-report data enhances the validity of the findings related to changes in child social skills, subsequent studies should use observational measures in order to examine changes in parent-child relationship factors and parenting behavior during interactions. It should also be noted that six of the secondary informants providing collateral data on the child's social skills were also receiving the mindfulness intervention. Their participation in the treatment may have impacted their perceptions of the child's behavior either through expectancy or through their own reductions in stress. Although it may have been informative to examine differences in social skills acquisitions between children who had one parent participating in the study versus those who had two participating parents, the low number of secondary informers participating

in the intervention limited our ability to conduct such analyses. Lastly, the current study showed improvements in child social skills from pre-treatment to post-treatment, as limited power prevented us from detecting changes through the experimental design. As a result, we were unable to control for developmental changes due to time, which may have contributed to child improvements.

The present study is an extension of the Neece (2013) study that examined the “spillover” effect of MBSR on child behavior problems, and builds upon the Neece and Baker (2008) study that examined the relationship between parental stress and child social skills. While the results of this study are novel in that social skills variables were examined longitudinally, these findings do not provide a complete model for the development of child social skills following parental stress reduction through MBSR. The mechanisms by which parental stress reduction and mindfulness training affect the parent-child relationship, and how the parent-child relationship subsequently impacts child social skills development remain unclear, and there are likely multiple mediators to this relationship. Further studies should examine possible changes in child emotion and behavior regulation as a byproduct of parent participation in MBSR, as well as a precursor to improved child self-control. There may also be additional moderators that should be examined, such as child level of intellectual functioning. Furthermore, studies should continue to examine the implications of these findings longer term, as social competence is foundational to the hierarchical development of healthy psychosocial functioning. Therefore, early intervention with highly stressed parents may continue to positively impact development over the course of several years, especially during school entry.

Despite its limitations, the implications of this study are significant. This study provides additional support for the use of MBSR as an innovative approach to treating social and emotional development in youth with DD by intervening with families early on in order to ameliorate the development of later psychopathology. While this implication was also acknowledged in the Neece (2013) article where reductions in the development of future behavior problems were emphasized, the current study suggests that parental stress should be acknowledged as a component of interventions that are specifically geared toward child social skills training. Parental mental health may limit the ability to support child social skills groups, thereby reducing the impact of these interventions. Delivering MBSR to parents of children with DD can enhance the efficacy of child-directed interventions by promoting parental consistency and parent-child closeness. These qualities are critical to social development, as they lead to a positive self-concept and self-esteem, which promote further development of healthy social skills for children (Ooi et al., 2006). Ultimately, the development of social competence is among one of the most important aspects of individual development, with social skills providing a critical protective factor against further maladjustment (Downey & Coyne, 1990; Fenning et al., 2011). Interventions should also address parental mental health as it provides a critical layer in a firm foundation on which social competence can be achieved, thereby optimizing child development overall.

## **CHAPTER THREE**

### **STUDY TWO: CHANGES IN PARENTING BEHAVIOR AFTER PARENT STRESS REDUCTION; A PATHWAY TO GAINS IN CHILD SELF-CONTROL**

#### **Abstract**

Parents of children with developmental delays are at an increased risk for clinical levels of stress that may negatively impact their child's social development. However, as study one indicated, targeting parenting stress may result in a "spill-over effect" of benefits onto the child. Specifically, self-control was shown to improve, with parent perceived attachment and consistency of discipline practices as partial mediators for this effect. The purpose of the current study is to expound on the results of study one, by further investigating the mechanisms through which parent-child relationships impact child social development. A pathway model explaining these relationships is proposed, which suggests that parent-child relationships impact parenting behaviors that promote child self-regulation and subsequent improvements in child self-control. A total of 23 parents were included in the analyses. Parents were filmed at three time points while engaging in parent-child clean-up tasks during laboratory assessments. Hierarchical regressions were conducted in order to explore how parent-reported attachment and discipline practices impacted parenting behavior observed in the laboratory setting. Parenting behavior was then analyzed as a predictor of observed child-self regulation during the interaction, and child self-regulation was examined as a predictor of parent reported child self-control. Changes in self-control reported in study one were found to be maintained at six months follow up. While neither attachment nor discipline practices predicted changes in parenting behavior, post-hoc analyses revealed that parenting

frustration was associated with reduced parental involvement. Furthermore, lower levels of intrusiveness and greater maternal scaffolding were associated with increased compliance and reduced non-compliance. Children who were non-compliant by means of overt-resistance tended to have greater parent-reported self-control, indicating that children who engage in adaptive self-regulatory behaviors during conflict with peers, may translate these behaviors to less adaptive non-compliance when under parent demands.

### **Introduction**

Parents of children with developmental delays (DD) consistently report higher levels of parenting stress when compared to parents of typically developing (TD) children (Baker et al., 2003; Baxter, 2000; Emerson, 2003; Neece, Green, & Baker, 2012; Webster, Majnemer, Platt, & Shevell, 2008). Elevated stress levels are not only shown to impact parental mental health (Deater-Deckard, 1998; Anastopoulos, Guevremont, Shelton, & DuPaul, 1992; Hastings, Daley, Burns, & Beck, 2006), but also lead to poor outcomes in children such as greater behavior problems (Baker et al., 2003; Neece et al., 2012; Donenberg & Baker, 1993; Johnson & Mash 2001), and significantly poorer social development (Neece & Baker, 2008). In fact, evidence suggests that the relationship between childhood problems and parenting stress is transactional, such that both variables mutually exacerbate each other over time (Baker et al., 2003; Neece et al., 2012; Orsmond, Seltzer, Krauss, & Hong, 2003). This connection is particularly concerning for families of children with DD, as these parents are not only more likely to experience

clinical levels of stress, but their children are inherently at a greater risk for problematic behavioral and social development (Merrell & Holland, 1997).

While most interventions attempt to break the negative cycle between stress and childhood problems by intervening directly with the child, Neece (2013) demonstrated that interventions primarily targeting parent stress may be an additionally effective means of improving childhood outcomes. This study reported improvements in child behavior problems after parent participation in Mindfulness Based Stress Reduction (MBSR, Neece, 2013). Additionally, improvements were noted in child social skills, with greater child self-control reported independently by participating parents, secondary caregivers, and teachers (Lewallen & Neece, under review). These results are particularly relevant to families of children with DD, as parent stress in this population has been tied primarily to behavior problems rather than developmental status (Baker, McIntyre, Blacher, Crnic, Edelbrock, & Low 2003; Baker, Blacher, Crnic, & Edelbrock, 2002; Hauser-Cram et al, 2001; Herring et al., 2006). Furthermore, as the impact of behavior problems on parent stress begins to decrease with child age, the development of poor child social skills becomes increasingly stressful on parents over time (Neece & Baker, 2008).

While further replication is needed, the results described above (Neece, 2013; Lewallen & Neece, under review) are promising indicators that childhood outcomes can be improved without necessarily intervening on the part of the child. Additionally, interventions that improve childhood problems by addressing parent stress may provide useful insight into the mechanisms through which parental stress impacts child development. For example, Lewallen & Neece (under review) suggested that the parent-child relationship might play a role in the improvement of child self-control, particularly

though consistency of discipline practices and parents' perceived attachment to their child. However, the mechanisms by which changes in the parent-child relationship finally lead to improved social skills are not fully understood. The purpose of the current study is to expand on the findings outlined by Lewallen and Neece (under review) and explore possible pathways by which the parent-child relationship impacts child social development of self-control. Specifically, the mediational roles of parenting behaviors and child-self regulation are examined.

### **The Impact of Stress on Parenting Processes**

#### ***The Impact of Stress on Parent-Child Relationships***

In addition to its impact on parental mental health and child behavior problems, high levels of a parenting stress are repeatedly shown to negatively impact various parent-child relational factors such as maternal sensitivity (Joosen, Mesman, Bakermans-Kranenburg, & van Ijzendoorn, 2012; Shin, Park, Ryu, & Seomun, 2008), parenting confidence (Frank et al., 1986; Johnston et al., 2003; Bohlin & Hagekull, 1987; Gondoli & Silverberg, 1997), and consistency of discipline practices (Lempers, Clark-Lempers, & Simons, 1989). Highly stress parents often find themselves feeling less secure within the parenting role, particularly when disability is present (Fonseca, Nazaré, & Canavarro, 2013; Sepa, Frodi, & Ludvigsson, 2004). While specific risk factors such as Autism Spectrum Disorder (ASD) may not directly interfere with relational attributes like parent-child closeness (Hoffman, Sweeney, Hodge, Lopez-Wagner, & Looney, 2009), parenting stress associated with this condition can promote insecure attachment, as indicated by psychological distance, rather than physical separation (Jarvis & Creasey, 1991). For

example, Kim and Kim (2009) found that mothers' poor psychological status had a negative effect on maternal sensitivity, which in turn had a negative effect on attachment. Decreases in maternal sensitivity may disrupt the parent-child relationship, as reciprocal give-and-take between mother and child is a critical attribute of sensitivity, promoting child comfort, child-mother attachment, and overall child development (Shin, Park, Ryu, & Seomun, 2008). Ruptures in parent-child attachment may then reciprocally impact the parent-child relationship by increasing stress related to the maternal role (Teti, Nakagawa, Das, & Wirth, 1991). As parenting stress increases, child behavior problems are prone to increase as well (Baker et al., 2003; Neece et al., 2012), further disrupting the relationship by reducing maternal satisfaction and heightening parenting frustration (Johnston & Mash, 1989).

### ***The Impact of Strained Parent-Child Relationships on Parenting Behavior***

In light of the evidence above, it is reasonable to suspect that the effects of stress on parent-child relationships may be expressed through less effective parenting behaviors (Deater-Deckard, 1998). Bockneck and colleagues (2012) found that parental depression and distress were correlated with "psychological absence," which predicted children's socio-emotional development. This effect was mediated by mother-child interactions. Strained parent-child relationships increase parents' risk of engaging in less effective parenting behaviors during interactions with their children. For example, the stresses of daily hassles can impact maternal sensitivity, causing parents to engage in less positive affect during exchanges with their children (Crnic et al., 2005) and ultimately displays of greater negative affect and harsher discipline (Joosen, Mesman, Bakermans-Kranenburg,



& van Ijzendoorn, 2012). These findings are especially concerning for families of children with special needs, who often require frequent and extensive accommodations that exacerbate the stresses of daily tasks.

Relationships impacted by more severe stressors such as parental mental illness are associated with even greater reductions in positive exchanges, which may be replaced by significantly unresponsive and uninvolved parenting typified by dysphoric affect (Downey & Coyne, 1990). However, the impact of parent stress on parent behavior can vary depending on the developmental status of the child. While greater stress in parents of TD children relates to neglectful parenting styles, stress in parents of children with DD was associated with more authoritarian styles of parenting (Woolfson & Grant, 2006). In fact, parents of children with a disability are at greater risk for overly directive and intrusive parenting behaviors rather than neglectful or detached parenting (Floyd, Harter, & Costigan; Green, 1983; Herring et al., 2006; McIntyre, 2008; Melamed, 2002; 2004). The presence of an illness or disability can exacerbate parent tendencies to be intrusive with their children, as parents become accustomed to meeting the child's many needs (Melamed, 2002). Brown and colleagues (2011) found that the presence of developmental delay not only predicted intrusiveness and negative affect, but also predicted subsequent negative parenting to a greater extent than other illnesses in infancy.

### ***The Impact of Parenting Processes on Child Social Development***

#### **Parent Behaviors that Impact Child Self-Regulation**

A child's ability to regulate internal states of emotion has long been considered an important antecedent to the development of social competence (Kopp 1982), as well as a

predictor of later psychopathology in general (Keenan, 2000). However, as it occurs internally, researchers have struggled to obtain consistent and reliable definitions of self-regulation. As a result, dysregulation is often measured through behavioral indices, such as the frequency and intensity of displays of negative emotion (Keenan, 2000), and child compliance to caregiver requests (Kopp 1982, Tracy, 2007). At times, self-regulation is also assessed through components of executive functioning such as inhibitory or effortful control (Rhoades, Greenberg, & Domitrovich, 2009). While measures of inhibitory control typically tap into cognitive rather than emotional self-regulation, the ability to self-inhibit is an important attribute of temperament that allows children to regulate anger (Rothbart & Bates, 1998). This skill is often required when responding to unpleasant parent demands (e.g., clean-up) with self-regulated compliance. By measuring these types of behavioral variables, studies are able to examine the direct influence of parenting behaviors on child self-regulation.

### ***Parental Sensitivity***

Parental sensitivity, often defined as a parent's ability to infer meaning from a child's behavioral cues and provide prompt and appropriate responses to the child's needs, is repeatedly shown to promote child self-regulated compliance (Tracy, 2007; Feldman, Klein, & Pnina, 2003; Lehman 2002; Edwards, 1995). This parental attribute is greatly associated with positive affect and positive parenting styles (Shin, Park, Ryu, & Seomun, 2008). Furthermore, a pattern of parental sensitivity and positive affect is seen across a majority of the parenting behaviors observed to promote competent social development, such as less harsh discipline (Green & Baker, 2011), sensitive-parenting

(Alink et al., 2009; Barnett, Gustafsson, & Deng, 2012), and calm discussion (Pettit, Bates, & Dodge, 1997). In a study by Kochanska, Murray, and Harlan (2000), mothers who were more responsive, emotionally available, supportive, accepting, and sensitive, were more likely to have children with greater effortful control. Furthermore, maternal responsiveness during a laboratory task uniquely contributed to children's level of effortful control 11 months later, suggesting a clear directional link between responsive maternal behavior and child self-regulation.

### ***Parental Intrusiveness***

As mentioned earlier, parents of children with developmental delays are at greater risk for engaging in fewer of the positive behaviors listed above, and higher levels of more negativistic behaviors such as intrusiveness (Brown 2011; Greene et al., 1983). While maternal detachment in infancy and toddlerhood contributes to reduced social-emotional competence (Belsky & Fearon, 2002), intrusive parenting is repeatedly shown to increase child behavior problems (Mantymaa et al., 2004) and heighten risk for socio-emotional difficulties later on (Esser et al., 1993). Parents' controlling behaviors may partially inhibit the development of social-cognitive processes that are critical for peer-related social competence (Deater-Deckard & Scarr, 1996; Guralnick, 1999). Children with DD may also be more vulnerable to the negative effects of intrusive parenting, which Green, Caplan, and Baker, (2013) found to predict lower social and adaptive functioning in children with DD, but not in TD children. This is an alarming finding, given that parents of children with disabilities are contextually more prone to behaving intrusively in response to the disability (Melamed, 2002). Conversely, parents who are

less power assertive are more likely to raise children who exhibit fewer disruptive playground behaviors, more prosocial behaviors, and are more preferred by their peers (Hart, DeWolf, Wozniak, & Burts, 1992).

### ***Parental Scaffolding***

It is not surprising that parents who are less sensitive to their child's cues and more intrusive during parent-child interactions would have a difficult time providing the appropriate support and assistance necessary for a child to achieve independent success in difficult tasks (Kermani & Brenner, 2000). However, this type of parenting behavior can be critical to child development. Parental "scaffolding," or a parent's ability to estimate the amount of assistance a child needs to achieve a goal and to structure a task in a way that promotes higher-level achievement in the child (Baker et al., 2007), is frequently tied to multiple aspects of self-regulation. Successful scaffolding behaviors often require adequate parental sensitivity, as parents must be attuned to their child's current range of competence in order to appropriately balance levels of parental control and assistance to accommodate the child's abilities (Hengameh & Brenner, 2000). Parents that behave intrusively do not provide children with the space necessary to accomplish tasks independently (Brown, 2011), potentially costing them the associated learning and sense of self-efficacy that would accompany achievement. On the other hand, by maintaining sensitivity to the child's motivation, competency and overall enjoyment of the task, parents can structure a difficult activity in a way that enhances positive coping and problem solving (Stright, Herr, & Neitzel, 2009). Parental scaffolding has been shown to promote resilience in the area of adaptive child behaviors (Fenning & Baker, 2012), such

as fewer displays of negative affect (Erickson et al., 2013; Hoffman, 2009), decreased aggressive behavior (Clark, 2013) and increased child compliance (Edwards, 1995). Scaffolding has also been shown to promote general socio-emotional competence (Baker et al., 2007; Hauser-Cram, 1999) and independence (Hauser-Cram, 1999).

### *Child Self-Regulation as a Pathway to Social Competence*

Problems in social development may be due in part to inadequately developed self-regulation skills in children with DD. Wilson and colleagues (2007) found that emotion regulation accounted for significant variance in social problems after controlling for developmental status. While effortful control is linked to better regulation of anger and ultimately increased restraint in social situations (Kochanska et al., 2000), greater expressions of negative affect and emotional intensity are related to poorer social skills and peer status (Eisenberg et al., 1993). A study by Baker and colleagues (2007) found that both emotion dysregulation and maternal scaffolding in early childhood each predict social skills later on. Surprisingly, while scaffolding was the strongest predictor of child social skills, this effect was not mediated by self-regulation. However, this study examined social skills collectively, rather than evaluating self-regulation as a mediator between maternal scaffolding and various subscales of social competency. Furthermore, while emotional/behavioral dysregulation was measured by the frequency and intensity of disruptive outbursts, child compliance was not considered. As a result, further research is warranted to better understand the potential mediating role of self-regulation in social development.

These considerations are especially relevant to families of children with DD, for whom dysregulation is exceedingly more common when compared with TD children (Baker et al., 2003; Baker et al., 2002; Merrell & Holland, 1997). It is possible that the development of emotional competence required for adequate self-regulation is disrupted by the familial risk associated with heightened levels of parenting stress in this population (Shaffer et al., 2012). In other words, highly stressed parents may place children at greater risk for frequent emotion dysregulation, which may subsequently impact social development. If so, this effect may account for Green and Baker's finding (2011) that parents' negative affect predicted significantly lower social skills for children with intellectual disability than for children with TD. These considerations make the extent of parental stress in this population greatly concerning, as they may place undue strain on the parent-child relationship, resulting in a cascade of negative effects on parenting behavior, child self-regulation, and ultimately social development.

### ***Reducing Parental Stress to Improve Parenting Processes***

There is evidence supporting the efficacy of interventions aimed at reducing parental stress. Interventions can vary greatly from standard service models such as respite care and parent-led support networks, to cognitive-behavioral group interventions (Hastings and Beck, 2004). Given the prominent surge of interest in treatments incorporating the practice of mindfulness (Allen, Blashki, & Gullon, 2006; Baer, 2003), it is not surprising that various "mindfulness-parenting" interventions are increasingly evaluated with highly stressed parents of children with developmental disabilities (Benn, Akiva, Arel, & Roeser, 2012; Bazzano et al., 2010). The use of mindfulness provides

unique advantages for parents, as it aims to achieve a more relaxed and peaceful state of mind that can promote greater awareness during parent-child interactions. As a result, parents might become better listeners to their children, as well as more aware of impulses, allowing them to achieve a greater sense of control during interactions. Furthermore, mindfulness-based approaches may enhance the capacity for perspective taking and empathic concern (Birnie, Speca, & Carlson, 2010; Block-Lerner, Adair, Plumb, Rhatigan, & Orsillo, 2007). This may increase parental sensitivity and attunement with children, qualities that are shown to promote social development (Alink et al., 2009; Barnett et al., 2012).

Interventions promoting mindful parenting have been used with both typically developing children with externalizing behavior problems as well as children with ASD (Singh et al., 2007) and found to be effective in reducing children's externalizing behavior and attention problems as well as improving children's self-control, compliance, and attunement to others (Bögels, Stevens, & Majdandžić, 2011; Singh et al., 2010a, 2010b). However, "Mindful parenting" interventions focus directly on the parent-child relationship by teaching parents to identify interactions that result in relational disconnectedness (Placone-Willey, 2002). In contrast, MBSR focuses directly on parents' personal stress without providing additional training on applying mindful skills to parent-child interactions. This treatment approach provides a unique opportunity to examine the specific benefits of parent stress reduction through mindfulness, without the influence of extraneous parent-training that may occur indirectly through mindful parenting interventions. MBSR training is completed through an 8-week manualized stress reduction intervention delivered in a group format. Participants learn to manage

stress by enhancing personal awareness on a moment-to-moment basis using several techniques including exercising awareness of physical sensations and cognitions, breathing exercises, meditation, and yoga. MBSR is supported by several decades of extensive research showing its effectiveness in reducing stress, anxiety, and depression, as well as promoting overall well-being (Chiesa & Serretti, 2009). Previous studies indicate that the majority of people who complete the 8-week MBSR program report experiencing a greater ability to cope more effectively with both short- and long-term stressful situations, a critical skill for parents of children with DD. MBSR may also help to improve the parenting experience by teaching parents to increase awareness and appreciation during pleasant interactions with their children.

To date, one study has evaluated MBSR as an intervention for parenting stress specifically (Neece, 2013), and found MBSR to be efficacious in reducing overall parenting stress in parents of children with DD. Parents who participated in this study reported significantly less stress and depression as well as greater life satisfaction compared to waitlist-control parents. Additionally, children whose parents participated in MBSR were reported to have fewer behavior problems following the intervention, specifically in the areas of attention problems and ADHD symptomatology.

### *Aims and Hypotheses*

The results of the Neece (2013) intervention importantly demonstrated that treatments focused on parent stress alone may have an indirect “spillover effect” on the child, as evidenced by significant improvements in child self-control. It was suggested that these spill-over effects may occur as a factor of changes in the parent-child



relationship after participation in MBSR, particularly through parent-perceived attachment and consistency of discipline practices (Lewallen & Neece, under review). The current study's purpose is to expand on these results by proposing mechanisms through which these parent-child relational variables affect the development of child self-control, as well as testing these mechanisms through a pathway model.

### **Aim One**

The first aim of this study was to examine whether changes occur in parent-child relationships, parenting behavior, and child self-regulation after parent participation in MBSR, and whether changes in self-control (Lewallen & Neece, under review) are maintained at follow-up. It was hypothesized that parents and children would show significant improvements in these areas. Given that the MBSR intervention did not directly target any of these constructs, we hypothesized that improvements would most likely be seen at follow-up, as the patterns associated with mindfulness and stress reduction would take time to significantly influence these variables.

### **Aim Two**

The second aim of this study was to explore a step-wise theoretical model explaining the mechanisms by which changes in parent-child relationships impact child self-control after parent participation in an MBSR intervention (see Figure 1). It was hypothesized that parent-child relationships will be impacted by participation in MBSR. Changes in parent-child relationships will then influence parenting behaviors that can impact child self-regulation, and ultimately lead to improved child social skills.

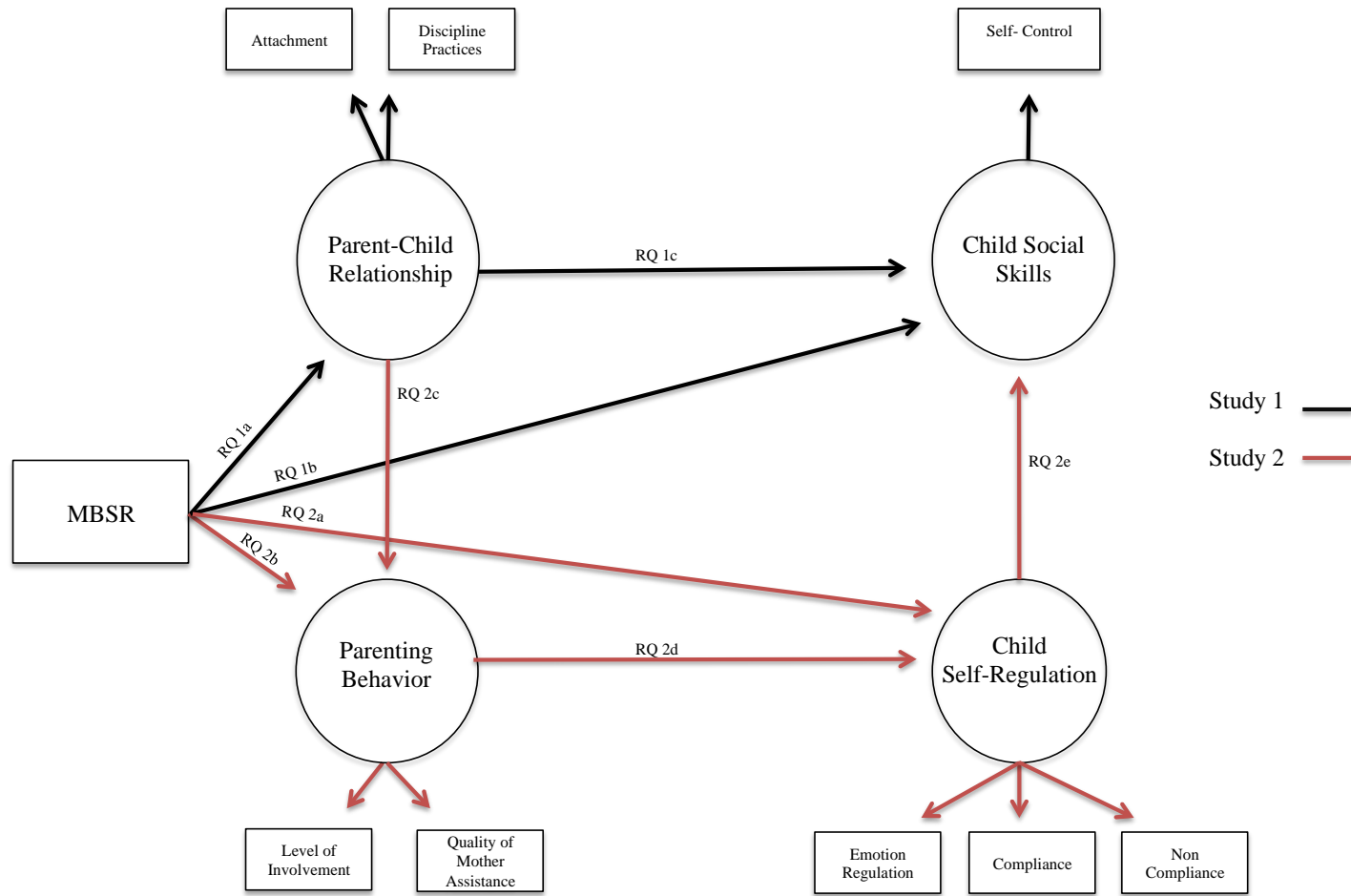


Figure 1. Hypothesized pathway model illustrating a possible mechanism by which the parent-child relationship may ultimately impact child self-control through parenting behavior and child self-regulation.

## **Study Two Method**

### *Measures*

#### **Demographic Data**

Demographic data was collected during an interview with the participating parent.

#### **Parenting Relationship Questionnaire (PRQ)**

The Parenting Relationship Questionnaire (PRQ; Kamphaus & Reynolds, 2006) is a 45-item scale designed to assess the relationship between the primary caregiver and his or her child. The scale measures this construct through seven subscales including attachment, discipline practices, involvement, parenting confidence, and relational frustration. Parents respond to the questions on the PRQ in a Likert type scale with Never (1) to Almost Always (4) (PRQ; Kamphaus & Reynolds, 2006). Because Lewallen and Neece (under review)'s findings suggested that changes in social skills were tied to changes in attachment and discipline practices, only these scales were selected for analysis. However post hoc analysis examined relationship frustration as well. Cronbach's alpha was calculated for each scale for the current sample and ranged from .62 to .85 ( $M = .75$ ).

#### **Social Skills Improvement System (SSIS)**

Child social skills were assessed by mothers using the Parent form of the Social Skills Improvement System rating scales (SSIS; Gresham & Elliott, 2008). The SSIS is a widely used 79-item questionnaire that has adequate reliability and validity, and provides a broad assessment of child social skills, problem behaviors and academic competence

for children. The present study examined seven child social skills sub-scales in this measure including communication, cooperation, self-control, responsibility, empathy, engagement, and assertion. Internal consistency for this sample was .87.

### **Clean-Up Task Coding Manual**

Observational coding was conducted using the Clean-Up Task Coding Manual Version 1.0 (Guisti, Mirsky, Dickenstein, & Seifer, 1997), which was adapted from the Child Compliance/Mother Discipline Project Coding/Entry Manual and used in previous research (Grazyna Kochanska & Aksan, 1995; Kochanska, Coy, & Murray, 2001;). The manual was designed for use in contexts that provide opportunities for parental control behaviors with young children (Guisti et al., 1997), and emphasizes the assessment of maternal discipline styles and child compliance occurring throughout a parent-child directed clean up interaction. Coding is divided into three segments: time interval coding of parent discipline, time interval coding of child compliance, and global codes of maternal instruction, support, and involvement. During the time interval coding, each interaction is coded in 15-second intervals. For each 15-second segment, one predominant code is assigned for maternal discipline, and one predominant code is assigned for child compliance. Once all individual segments have been coded, global codes of maternal control are assigned to represent the entire cleanup interaction.

### ***Time-Interval Coding of Maternal Discipline***

Previous reported reliability for this scale ranged from  $k = .80-.87$  (Kochanska et al., 2001). Individual reliabilities for the current sample are listed below. Each 15-second

segment is assigned a single predominant code that represents the mother's primary style of discipline employed. Possible codes include:

- 1) No interaction (Intraclass Correlation Coefficient (ICC) = 1.00). This code is applied to mothers who are psychologically uninvolved and demonstrate no verbal or physical interaction.
- 2) Social exchange (ICC = .81). This code is assigned to interactions that are unrelated to cleanup task.
- 3) (3) Gentle guidance (ICC = .91). This code is assigned to mothers who direct children to clean up subtly or playfully and provide positive feedback.
- 4) (4) Control (ICC = .90). This code is assigned to mothers who give directions in a matter of fact but non-forceful way.
- 5) (5) Forceful negative, high-power control (ICC = .60). This code is assigned to mothers whose directions are power-assertive, involving a clash of wills.

### ***Global Codes of Maternal Control***

Once the parent-child interaction is viewed twice (once to code maternal discipline and once to code child compliance) the overall interaction is assigned 3 distinct codes representing different aspects of maternal control. These include:

- 1) Quality of Mother Assistance (ICC = .98). This code was used as a measure of parental scaffolding. It represents the degree to which a mother assists the child in a way that maintains his or her interest and motivation in the cleanup task, while allowing the child maximum opportunity for autonomous behavior. Scores on this code can range from one (totally intrusive) to 5 (mother provides clear, well-

paced effective instruction). Additional scores may be assigned if the mother's assistance was not applicable to the interaction. These scores include: 6 (child quickly completes task without need of mother assistance), and 7 (child slowly completes task without need of mother assistance).

- 2) Mother Supportive Presence (ICC = .92). This code was used as a measure of maternal sensitivity. It represents the degree to which the mother provides an emotional climate that is supportive of completing the cleanup task, regardless of the effectiveness of her intervention. Scores on this code range from 1 (mother is not supportive) to 5 (mother's support is excellent in providing the child with a positive experience). An additional score of 6 can be assigned if previous scores are not applicable because the child completes the task quickly without need of any support.
- 3) Level of Mother Involvement (ICC = 1.00). This code was used as a measure of intrusiveness. It represents the degree to which the mother or child is primarily responsible for completing the cleanup task. Scores on this code range from 1 (no mother involvement) to 4 (no effective child involvement). An additional score of 5 can be assigned if the previous scores are not applicable because the cleanup task is abandoned or not completed.

### ***Time-Interval Coding of Child Compliance***

Each 15-second segment is assigned a single predominant code that represents the child's primary style of compliance with the mother's cleanup requests. Individual reliabilities for the current sample are listed below. Possible codes include:

- 1) Timeout (ICC = 1.00). This code is applied when there is no clean-up behavior by the child and the mother has suspended the expectation that the child should be cleaning up.
- 2) Committed Compliance (ICC = .86). This code is assigned to children who wholeheartedly embrace the mother's agenda with active involvement in picking up toys.
- 3) Situational Compliance (ICC = .70). This code is assigned to children who are receptive to the mother's agenda but exhibit half-hearted cooperation. The child requires consistent prompts in order to continue the clean-up task.
- 4) Passive Non-Compliance (ICC = .99). This code is assigned to children who passively reject the mother's agenda, ignoring her directives without anger.
- 5) Overt Resistance (ICC = .86). This code is assigned to children who overtly refuse the mother's agenda without clearly articulated anger or defiance.
- 6) Overt Defiance (ICC = .91). This code is assigned to children who overtly reject and protest the mother's agenda with accompanying anger or defiance.

### ***Calculating Time-Segmented Scores***

Because segments may vary in length due to parent-child dyads completing the cleanup task at different rates, proportions were calculated for each variable that employs time interval coding. For example, for each segment the proportion of 15-second segments employing a style of maternal discipline considered Gentle Guidance were calculated, as well as the proportion of 15-second segments employing Control discipline and so on.

## **Dysregulation Coding System**

Emotional and Behavior dysregulation will be coded observationally using the Dysregulation Coding System (Baker, Fenning, Crnic, Baker, & Blacher, 2007; C. Hoffman, Crnic, & Baker, 2006). The goal of this coding system is to capture children's ability to self-regulate as defined by controlling emotions and behaviors. This coding system was designed for use within the social context of a dyadic interaction (i.e., between child and caregiver). Dysregulation is coded based on 5 aspects of regulatory skills, which include duration, intensity, frequency, lability, and recovery time after an episode of dysregulation. These aspects are considered in proportion to the time length of the segment that is coded. After each cleanup interaction is watched twice, one emotion dysregulation score and one behavior dysregulation score will be assigned for the interaction. Hoffman and colleagues (2006) reported fairly high reliability for the Dysregulation Coding System, including  $r = .90$  for the overall coding system and reliability of .79 for the Emotion Dysregulation Subscale. ICC's for this sample are listed below.

### ***Emotion Dysregulation***

Emotion dysregulation is determined by intense, frequent, expressions of emotion that are inappropriate for the situation such as crying, screaming, intense facial expressions, and vocalizations. Children are assigned scores ranging from 0 (no emotion dysregulation present) to 4 (very high degree of emotion dysregulation present). ICC = .95.



### ***Behavior Dysregulation***

Behavior dysregulation is defined as behavior that is disruptive to goal oriented tasks such as running around the room, playing inappropriately, extreme squirming or fidgeting, and so forth. Children are assigned scores ranging from 0 (no behavior dysregulation present) to 4 (very high degree of behavior dysregulation present). ICC = .93.

### **Reliability of Observational Measures**

A team of trained coders coded each segment independently. This team consisted of two graduate students who agreed upon the codes assigned for each interval and segment. Additionally, a “master coder” coded each segment independently, and compared codes with the coding team to ensure reliability. Absolute agreement intra-class correlation coefficient (ICC) was calculated using a two-way mixed model in order to ensure reliability between raters ( Kottner et al., 2011; Shrout & Fleiss, 1979;). ICCs ranged from .89 to .90 across all observational scales. ICCs for individual scales are listed below.

### ***Data Analysis***

Multiple linear regressions were conducted to test relationships from pre-treatment to post-treatment, and then from post-treatment to follow-up. The post treatment or follow up score of each variable of interested regarding parenting behaviors, child self-regulation, and child social skills was entered as the dependent variable. The corresponding pre-treatment variable was then entered in the first step of the analysis,

followed by the pre-treatment score of the independent variable (within parent-child relationships, parenting behavior, or child self-regulation) in the second step, and its corresponding post treatment or follow up variable entered in the final step. By controlling for scores at pre-treatment, we were able to examine how changes in the independent variable predicted changes in the dependent variable. The specific variables used in each step of each regression are outlined in the results below.

### **Parent-Child Relational and Social Skills Variables**

To avoid excessive familywise type-I error, only the parent-child relational and social skills variables found to be significantly associated by Lewallen and Neece (under review) were selected for analysis (i.e., attachment, discipline practices, and self-control).

### **Parenting Behavior Variables**

Originally, the variables representing parent behavior included mother supportive presence, discipline style (i.e., gentle guidance and control), level of involvement and quality of mother assistance. However, correlational analyses revealed significant concerns with multicollinearity when using each of these variables (See Table 6). Discipline style was removed from the analyses due to high correlations with all other variables except level of involvement. Furthermore, a-priori analyses also revealed that while highly correlated, quality of mother assistance was a slightly better predictor of child self-regulation, and it was thus selected for inclusion instead of mother supportive presence. As a result, the parenting behavior variables selected for final analyses were level of involvement and quality of mother assistance.

**Table 6.** Correlations among Parenting Behavior Variables

	Gentle Guidance	Control	Mother Supportive Presence	Quality of Mother Assistance	Level of Involvement
Gentle Guidance	1.00				
Control	.86***	1.00			
Mother Supportive Presence	.80***	-.60***	1.00		
Quality of Mother Assistance	.58***	-.33	.80***	1.00	
Level of Mother Involvement	-.13	-.19	-.27	-.43*	1.00

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

## **Child Self-Regulation Variables**

Originally, child-self regulation was measured by recording various compliance styles (committed compliance and situational compliance), as well as non-compliance styles (passive non-compliance, overt resistance, and overt defiance). To avoid increased familywise type-I error that would be caused by conducting regressions to examine each variable individually, compliance was dichotomized into two variables: compliance and non-compliance (Ekas, McDonald, & Messinger, In preparation). Observational measures of emotional dysregulation and behavioral dysregulation were also collected. However, due to unacceptably elevated levels of skewness and kurtosis, the behavioral dysregulation scale was discarded from analyses.

## ***Results***

### **Changes in Variables Across the Intervention**

Changes in variables across the intervention were tested using paired sample *t*-tests (RQs: 1a, 1b, 2a, and 2b in Figure 1). As mentioned by Lewallen and Neece (under review), at intake parents tended to score within the average range in discipline practices (mean *T*-score = 44, 30<sup>th</sup> percentile), and attachment (mean *T* = 42, 20<sup>th</sup> percentile). While *t*-tests revealed that neither of these variables changed significantly from pre to post treatment, parents reported increased consistency in discipline practices at follow-up when compared to intake (N = 20, Pre treatment, *M* = 14.8, *SD* = 5.7; Follow Up, *M* = 16.5, *SD* = 5.9; *t* = 2.4, *p* < .05, *d* = .43). Furthermore, the significant changes observed in self-control in the aforementioned study (Lewallen & Neece, under review) were maintained at follow-up (N = 20, Pre treatment, *M* = 5.9, *SD* = 3.4; Follow Up, *M* = 7.8,

$SD = 3.5; t = 2.5, p < .05, d = .57$ ). See Table 7 for changes in variables across the intervention.

Although the instructions during the clean-up task included the statement “make sure he/she puts the toys away by himself,” mothers on average took at least minimal responsibility for the cleanup task. This tendency was reduced at follow-up, indicating that mothers reduced their involvement, allowing children to take significantly more responsibility for the task ( $N = 20$ , Pre treatment,  $M = 2.2, SD = 1.1$ ; Follow Up,  $M = 1.8, SD = .93; t = -2.6, p < .05, d = .60$ ). Neither parent-child relational variable (attachment and discipline practices) was predictive of changes in parenting behavior. However, due to the small sample size, insufficient power may account for these non-significant findings.

**Table 7.** Changes in Parent-Child Relational Factors, Parenting Behaviors, and Child Self-Control

	Pre-Tx	Post-Tx	Follow-Up	Changes from Pre-Tx to Post-Tx		Changes from Post-Tx to Follow-up		Changes from Pre-Tx to Follow-up	
	M(SD)	M(SD)	M(SD)	<i>t</i>	<i>d</i>	<i>t</i>	<i>d</i>	<i>t</i>	<i>d</i>
<b>Parent-Child Relationship</b>									
Attachment	20.9(4.6)	21.4(4.5)	22.6(4.1)	-.053	.08	-1.4	.23	1.8	.34
Discipline Practices	14.8(5.7)	15.3(6.1)	16.5(5.9)	-.77	.06	-1.7	.33	2.4*	.43
<b>Parenting Behavior</b>									
Level of Involvement	2.3(1.1)	2.0(1.1)	1.8(.93)	.96	.26	1.3	.45	-2.6*	.60
Quality of Mother Assistance	4.1(1.2)	4.1(1.1)	4.2(1.1)	-.16	.00	.36	.08	.55	.09
<b>Child Self-Regulation</b>									
Emotion Dysregulation	.61(1.0)	.39(.84)	.30(.57)	.93	.20	.19	.10	1.7	.38
Child Compliance	.74(.34)	.77(.32)	.79(.26)	-.26	.07	-.51	.10	1.1	.19
Child Non-Compliance	.25(.33)	.20(.28)	.15(.23)	.71	.14	.59	.15	1.54	.29
<b>Social Skills</b>									
Child Self-Control	5.9(3.4)	7.5(3.6)	7.8(3.5)	2.6*	.54	.31	.09	2.5*	.57

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

## **The Parent-Child Relationship as a Predictor of Parenting Behavior**

In order to test the first step of the relationships in Figure 1 (RQ 2c), two sets of four regressions were conducted to test relationships from pre-treatment to post-treatment, and then from post-treatment to follow-up. Each parenting behavior variable (quality of mother assistance/scaffolding and level of involvement/intrusiveness) was independently regressed onto each parent-child relational factor (attachment and discipline practices). Each post treatment and follow up parenting behavior variable was treated as the dependent variable. The corresponding pre-treatment variable was then entered in the first step, the pre-treatment parent-child relational variable was entered in the second step, and the post treatment or follow-up parenting relational variable was entered in the final step. This allowed us to examine how changes in parenting behavior were related to changes in the parent-child relationship by controlling for pre-treatment levels of each variable. Neither parent-child relational variable predicted changes in the parenting behaviors measured at either post-treatment or follow up (see Table 8).

**Table 8.** Pathway from the Parent-Child Relationship to Parenting Behavior

	Changes Pre Tx to Post Tx				Changes Pre Tx to Follow-up			
	<i>B</i>	<i>SE(B)</i>	$\beta$	$\Delta R^2$	<i>B</i>	<i>SE(B)</i>	$\beta$	$\Delta R^2$
DV: Quality of Mother's Assistance (QOMA)								
<b>IV: Attachment</b>								
Step 1: Pre-Tx QOMA	.144	.210	.170		.324	.213	.403	
Step 2: Pre-Tx Attachment	-.025	.060	-.120		.042	.054	.205	
Step 3: Post/Follow Up Attachment	-.019	.058	-.090	.006	-.041	.074	-.162	.016
<b>IV: Discipline Practices</b>								
Step 1: Pre-Tx QOMA	.178	.215	.210		.325	.210	.405	
Step 2: Pre-Tx Discipline Practices	.026	.081	.150		.033	.062	.195	
Step 3: Post/Follow Up Discipline Practices	-.029	.071	-.190	.010	.000	.064	-.004	.000
DV: Level of Involvement								
<b>IV: Attachment</b>								
Step 1: Pre-Tx Level of Involvement	.489	.228	.490*		.485	.206	.549*	
Step 2: Pre-Tx Attachment	-.021	.058	-.090		.002	.051	.010	
Step 3: Post/Follow Up Attachment	.023	.058	.090	.007	-.002	.062	-.008	.000
<b>IV: Discipline Practices</b>								
Step 1: Pre-Tx Level of Involvement	.300	.262	.300		.393	.247	.446	
Step 2: Pre-Tx Discipline Practices	-.074	.075	-.369*		.003	.058	.016	
Step 3: Post-Tx/Follow Up Discipline Practices	.003	.070	.018	.000	-.032	.053	-.201	.017

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



### ***Post-Hoc Analysis***

As a post-hoc exploratory analysis, relationship frustration was examined as a possible predictor for parenting-behavior, and found that increases in frustration predicted decreases in parent level of involvement at post treatment ( $\beta = -.481, t(3) = -2.2, p = .046$ ) and at follow up ( $\beta = -.642, t(3) = -3.5, p = .004$ ).

### **Parenting Behavior as a Predictor of Child Self-Regulation and Compliance**

In order to test the second step of the relationships in Figure 1 (RQ 2d), two sets of six regressions were conducted in which each child self-regulation variable (emotion dysregulation, compliance, and non-compliance) was regressed onto each parenting behavior variable (attachment and discipline practices). As with the analyses above, these relationships were tested from pre-treatment to post treatment, and then again from pre-treatment to follow-up. Each post treatment or follow up child self-regulation variable was treated as the dependent variable, with the corresponding pre-treatment variable entered in the first step, the pre-treatment parenting behavior variable entered in the second step, and the parenting behavior post-treatment or follow-up variable entered in the final step. As described in the previous analyses, controlling for pre-treatment levels of each variable allowed us to examine how changes in child self-regulation were related to changes in parenting behavior. Neither of the parenting behaviors were successful predictors of children's ability to emotionally self-regulate during the cleanup task at post-treatment or follow-up. However, post treatment changes in both child compliance and non-compliance were significantly predicted by changes in both parenting behaviors examined in this study. As parents became more involved in the cleanup task, taking

responsibility for the completion of the task, children were less likely to be compliant to parent requests ( $\beta = -.52, t(3) = -2.3, p = .037$ ) and more likely to become non-compliant ( $\beta = .573, t(3, 18) = 2.6, p = .017$ ). Additionally, as mothers improved in their ability to effectively assist the child in the task while providing maximum opportunity for their autonomy in completing the task (i.e., adequately scaffolding the clean-up task), children become more likely to comply ( $\beta = .803, t(3, 18) = 5.3, p < .001$ ), and less likely to be non-compliant ( $\beta = -.750, t(3, 18) = -4.5, p < .001$ ). These relationships were not observed at follow-up, see Table 9.

**Table 9.** Pathway from Parenting Behavior to Child Self-Regulation

	Changes Pre Tx to Post Tx				Changes Pre Tx to Follow-up			
	B	SE(B)	$\beta$	$\Delta R^2$	B	SE(B)	$\beta$	$\Delta R^2$
DV: Child Compliance								
<b>IV: Level of Involvement (LOI)</b>								
Step 1: Pre-Tx Compliance	.064	.203	.067		.340	.169	.463	
Step 2: Pre-Tx LOI	-.010	.070	-.033		.047	.065	.188	
Step 3: Post/Follow Up LOI	-.157	.068	-.522*	.243	-.070	.073	-.249	.042
<b>IV: Quality of Mother Assistance QOMA)</b>								
Step 1: Pre-Tx Compliance	.239	.180	.253		.151	.185	.205	
Step 2: Pre-Tx QOMA	-.046	.052	-.178		.041	.055	.201	
Step 3: Post/Follow Up QOMA	.245	.045	.807***	.564***	.098	.051	.410	.549*
DV: Child Non Compliance								
<b>IV: Level of Involvement (LOI)</b>								
Step 1: Pre-Tx Non Compliance	.098	.171	.116		.242	.166	.370	
Step 2: Pre-Tx LOI	-.009	.058	-.035		-.020	.063	-.093	
Step 3: Post/Follow LOI	.152	.056	.573*	.244*	-.054	.070	-.218	.031
<b>IV: QOMA</b>								
Step 1: Pre-Tx Non Compliance 1	.309	.196	.365		.027	.204	.041	
Step 2: Pre-Tx QOMA	.057	.056	.249		-.041	.059	-.229	
Step 3: Post-Tx/Follow Up QOMA	-.198	.044	-.750***	.482**	-.040	.056	-.192	.028
DV: Emotion Dysregulation								
<b>IV: Quality of Mother Assistance QOMA)</b>								
Step 1: Pre-Tx Emotion Dysregulation	.246	.189	.290		.261	.127	.467	
Step 2: Pre-Tx QOMA	.014	.158	.021		.057	.113	.129	
Step 3: Post/Follow Up QOMA	-.176	.187	-.222	.041	-.042	.139	-.081	.005
<b>IV: Level of Involvement (LOI)</b>								
Step 1: Pre-Tx Emotion Dysregulation	.067	.181	.079		.303	.133	.552	
Step 2: Pre-Tx LOI	.347	.190	.436		-.144	.158	-.264	
Step 3: Post/Follow Up LOI	.052	.177	.067	.003	.023	.164	.038	.001

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

### **Child Self-Regulation and Compliance as Predictors of Self-Control**

Two sets of three regressions were conducted in order to test the final step of the relationships in Figure 1 (RQ 2e). Self-control was regressed onto each child self-regulation variable in three separate regressions that were conducted using post treatment variables and then repeated using follow-up variables. In each analysis, either post-treatment or follow-up self-control was entered as a dependent variable with pre-treatment self-control entered in the first step. The second step included the pre-treatment self-regulation variable, with the post treatment or follow-up score for this variable entered in the last step. Changes in child non-compliance were predictive of changes in child self-control ( $t(3) = 2.6, p < .001$ ). Surprisingly, the relationship between these changes occurred in the direction opposite of what was hypothesized, such that greater non-compliance during the clean-up task predicted greater child self-control as reported by mothers ( $\beta = .500$ ). No significant effect was observed between child compliance, child self-regulation, and child self-control (See Table 10).

**Table 10.** Pathway from Child Self-Regulation to Child Self-Control

	Changes Pre Tx to Post Tx				Changes Pre Tx to Post Tx			
	B	SE(B)	$\beta$	$\Delta R^2$	B	SE(B)	$\beta$	$\Delta R^2$
<b>IV: Child Compliance</b>								
Step 1: Pre-Tx Self-Control	.640	.200	.609**		.622	.254	.618*	
Step 2: Pre-Tx Compliance	.072	1.929	.007		-.092	2.870	-.009	
Step 3: Post/Follow Up Compliance	2.108	2.281	.180	.029*	-5.612	5.466	-.327	.047
<b>IV: Child Non Compliance</b>								
Step 1: Pre-Tx Self-Control	.625	.203	.595**		.535	.185	.532	
Step 2: Pre-Tx Non Compliance	.163	1.986	.016		.403	1.933	.040	
Step 3: Post/Follow Up Non Compliance	-2.496	2.515	-.199	.033*	10.150	3.956	.500*	.219*
<b>IV: Emotion Dysregulation</b>								
Step 1: Pre-Tx Self-Control	.712	.198	.678**		.339	.241	.347	
Step 2: Pre-Tx Emotion Dysregulation	.747	.668	.209		-1.937	2.171	-.217	
Step 3: Post/Follow Up Emotion Dysregulation	-.025	.799	-.006	.000*	1.498	2.540	.148	.020

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

## *Discussion*

The current study served as an extension of Lewallen and Neece (under review), which found that children's social self-control improved after parent participation in MBSR, and that this change was partially mediated by changes in parental perceived attachment and consistency of discipline practices. The current study expanded on these findings, by demonstrating that changes in social skills were maintained at six-month follow up, and subsequently conducting a more in depth exploration of the mechanisms by which changes in the parent-child relationship may impact child social development. A pathway model was hypothesized, in which changes in the parent-child relationship may lead to changes in parenting behavior that influence child self-regulation, and subsequently affect child self-control (see Figure 1). Two of the three steps described in this model had significant findings linking portions of the hypothesized pathway. These included significant findings demonstrating that parenting behavior was associated with child self-regulation, and findings demonstrating that child self-regulation was associated with social self-control. While the first portion of the model was not significant, post-hoc analysis suggested that changes in relationship frustration may also play a role in parenting behavior and subsequent child self-regulation.

### **Pathway from the Parent-Child Relationship to Parenting Behavior**

Contrary to our hypothesized model, neither attachment nor discipline practices predicted any changes in parenting behavior. These results may have been due to underpowered analyses given the low sample size, particularly when examining relationships at follow-up. However, in addition to non-significance, the small effect

sizes observed in these analyses highlight the possibility that changes in parent-perceived attachment and consistency of discipline practices may lead to improved self-control via a pathway that is independent of the model outlined in this study. It is important to note that several changes were observed from pre-treatment to follow-up, which were not present at post-treatment. As a result, changes in other areas of the parent-child relationship may continue to occur after MBSR participation, and may also play a role in the longer-term improvements in child self-control.

While analyses including all parent-child relational variables could not be run due to an excessive increase of probable type-I error, Lewallen & Neece (under review) reported significant improvements in parent-child relationship frustration after treatment. When compared to other parent-child relational variables, relationship frustration may have been most impacted in the parent-child interactions, as instructions required parents to place an unpleasant demand on the child (i.e., clean-up), creating a potentially frustrating situation. Parents who frequently endure high rates of child behavior problems and low compliance may experience increased frustration and become less confident in their ability to parent the child during demanding tasks. Whereas greater parenting confidence is predictive of appropriate involvement and monitoring (Shumow & Lomax, 2002), the current findings suggest that frustrations with the parent-child relationship may promote lower involvement during demand tasks. This is may be a result of decreased confidence possibly stemming from a sense of learned helplessness when repeatedly met with child non-compliance. When the current sample was compared to the normative sample of the PRQ (Kamphaus & Reynolds, 2006), parents showed significantly lower parenting confidence (see Table 1). While a general lack of parenting confidence in the

presence of childhood disability is typical and may not always impact involvement, relationship frustration may play an important moderating role in this effect. In other words, parents of children with disabilities are already at a greater risk for lower parenting confidence, which may promote detachment in the presence of relationship frustration.

As mentioned earlier, parents of children with DD are more likely to be overly involved to the point of intrusiveness (Melamed, 2002; Brown et al., 2011). As a result, decreased involvement may prove to be an adaptive change to some extent. An adaptive decrease in intrusiveness should not be confused with the excessive lack of involvement associated with parental detachment, which is characterized by psychological/emotional withdrawal from the relationship (Bockneck et al., 2012). While detached parents of children with DD may provide more space for children to explore the limits of their independent capabilities, overall they are still placed at greater risk for poor socio-emotional development (Belsky & Fearon, 2002). Excessively uninvolved parents are far less likely to develop aspects of parental sensitivity required to evaluate their child's needs in order to adequately scaffold difficult tasks. As a result, they are less likely to promote successful independent achievement in their child (Kermani & Brenner, 2000), and more likely to be met with non-compliance (Edwards, 1995). They are then placed at a greater risk of continuing frustrating exchanges that reduce their confidence and create a cycle of negative engagement.

### **Pathway from Parenting Behavior to Child Self-Regulation**

Results demonstrated that parents significantly reduced the amount of their



involvement in the child's cleanup activity at follow-up when compared to pre-treatment. Furthermore, changes in a parent's level of involvement were predictive of increases in child compliance and decreases in non-compliance to parent requests. It is important to consider that parents of lower functioning children may have become more involved in the task due to their child's limited ability to complete the task independently. However, the heavy stress experienced by parents of lower functioning children may also cause them to underestimate their child's capability to complete the task more autonomously. Reductions in stress in conjunction with increased mindfulness as a result of MBSR may make parents more aware of their children's cues during the task allowing them to behave more sensitively to the child's needs. By approaching the task with patience, parents may refrain from being intrusive, allowing the child the time to complete the task at his/her own pace. In this context, children may feel more successful, receive greater praise for complying, and experience encouragement for further compliance throughout the task. This may be especially true for children who are lower functioning, and typically take longer to complete demanding activities.

In addition, quality of mother assistance also predicted increased compliance and decreased non-compliance. In other words, as mothers use more effective scaffolding strategies for getting a child to clean up, the child is more likely to comply with her request. Effective strategies take into account the child's level of functioning, providing clear, well-paced, and flexible assistance. Mothers who are less effective may be more prone to providing vague requests, being either overly intrusive or overly detached, and may fail to intervene when the child is not completing the task. In line with the results of the current study, Baker et al. (2006) found that maternal scaffolding observed during a

frustrating mother-child laboratory task predicted later social skills development, a result that was partially mediated by child dysregulation. Furthermore, Neitzel and Stright (2003) demonstrated that early maternal scaffolding during problem-solving tasks was predictive of later child self-regulatory academic behavior. The current findings not only support the importance of scaffolding behaviors in promoting child self-regulation and maintaining continued compliance during stressful tasks, but also suggest the importance of addressing parent stress as a means of promoting such parent behaviors. Furthermore, mindfulness training emphasizes the practice of moment-to-moment awareness, which may make parents more sensitive to the child's reaction to their teaching style. This would allow parents to learn to adjust teaching methods in the moment, allowing them to approach more effective methods of increasing child compliance during frustrating tasks.

### **Pathway from Child Self-Regulation to Social Self-Control**

Surprisingly, increases in child non-compliance observed during the laboratory clean-up task from pre-treatment to follow-up were predictive of increases in parent reported self-control on the SSIS. When considering this result, a closer look at the constructs measured may be warranted. Firstly, the items included on the SSIS self-control scale are primarily related to self-control with regards to how children respond to social conflict. These items include: resolves disagreements with you calmly, stays calm when teased, takes criticism without getting upset, makes a compromise during a conflict, tolerates peers when they are annoying, responds appropriately when pushed or hit, and stays calm when disagreeing with others (SSIS, Gresham & Elliott, 2008). A child's tendency to engage in similar (i.e., calmly avoidant) behaviors may have been captured

during the parent-child interaction, particularly when children experienced a disagreement with the parent's agenda to complete the clean-up task. For example, children who responded to this disagreement with compliant behavior demonstrated a likelihood of greater internal self-regulation during an unpleasant task. However, non-compliant behaviors may not have necessarily represented internal dysregulation. As mentioned earlier, the "non-compliance" variable used in this study was created as an aggregate of three non-compliance styles (passive non-compliance, overt resistance, and overt defiance). A post-hoc analysis confirmed that within non-compliance, increases in overt resistance, rather than passive non-compliance or overt defiance, significantly predicted greater parent report of child self-control ( $\beta = -.623$ ,  $t(3) = -4.2$ ,  $p = .001$ ). Children who were overtly resistant tended to escape the demand situation by actively turning away from the task or negotiating with parents without any demonstration of anger or defiance. This was in comparison to children who ignored parent demands and continued playing (passive non-compliance), or angrily and defiantly protested the task (overt defiance).

While overt resistance during parent-child interactions is unlikely to be adaptive, this attribute may translate into adaptive self-control in situations with peers. Children who demonstrate an ability to overtly resist the demands of their peers while abstaining from angry outbursts may be more likely to better negotiate social situations and achieve compromise when compared to children who behave in an emotionally dysregulated manner (Eisenberg et al., 2000). Children who engage in angry outbursts during disagreements are more likely to be rejected by peers, whereas excessively passive children may demonstrate low levels of assertion that impede their ability to develop

adaptive communication skills with peers (Bornstein, Bellack, & Hersen, 1977). During the parent-child interaction task, overtly resistant children acknowledged the presence of a conflict, and selected response behaviors that conveyed disagreement, without becoming overtly dysregulated in the process (e.g., turning away, or calmly refusing/negotiating). Parents' responses on the SSIS indicated that children who exhibited this type of behavior during the interaction task were more likely to exhibit this behavior in social situations with their peers as well.

While behaving in an overtly resistant, rather than defiant or passive, manner may be adaptive in peer-based situations, an important step in the development of social competence is the acquisition of sensitivity to contextual cues for social behavior (Erikson & Schultz, 1997). Children with ASD are significantly less likely to adjust their behavior across social contexts (Ratto et al., 2011), since they experience greater difficulties learning the abstract rules of social stimuli (Jones, Webb, Estes, & Dawson, 2013). As a result, they may be reinforced for behaviors considered to be adaptive expressions of self-control in one context (i.e., when engaging with peers), and apply the same behaviors in another context where they are less adaptive (i.e., when receiving directions from a parent or teacher).

### **Limitations and Implications for Future Research**

The current study is subject to several limitations that should be considered when interpreting the findings reported. First, as with any study that does not utilize a randomized controlled design, the changes occurring in the sample may be attributed to child development occurring as a factor of time alone. This is particularly relevant for

studies examining outcomes in children undergoing sensitive developmental periods, such as those in the current sample. For example, decreases in parent involvement during the cleanup task may occur as children develop and naturally gain autonomy and responsibility. However, as children with DD tend to develop at slower rates than TD children, this may be of less concern within the current sample. Additionally, due to the small sample size, the relationships outlined in the pathway model were tested individually (i.e., 1-parent-child relationships to parenting behavior, 2-parenting behavior to child self-regulation, and 3-child self-regulation to child self-control), preventing us from more appropriately examining the full model using structural equation modeling. Furthermore, this form of analysis limited us to exploring fewer variables for each construct in order to reduce the probability of type-I error that would accompany a higher quantity of regressions. As a result, relationships were measured unidirectionally, despite evidence that parent-child interactions occur in transactional dyads in which each is an active participant of the situation influencing the other (Neece, 2012; Damus, LaFreniere, & Serketich, 1995). In order to more accurately explore the nature of these variables, replication is needed with a greater sample size, which would provide sufficient power to test a full bidirectional model.

### **Conclusions and Implications for Clinical Practice**

The findings outlined in this study continue to support the importance of addressing parent stress as a means of improving child outcomes. Additionally, findings suggest that clinicians should be cognizant of the ways in which parents respond to stressors. Parents who experience high levels of relationship frustration may become less

detached from their children, experience greater levels of non-compliance, and fall victim to a negative cycle of poor parent-child interactions. As parents typically experience lower levels of parenting confidence associated with raising a child with a disability, they may behave more intrusively, which reduces the likelihood of child compliance, and increases the likelihood of non-compliance. Rather than exclusively focusing on helping parents become more or less involved, parenting-based treatments may be most effective when the focus is on training parents when to become aware of child cues, and how to use this information to select parenting behaviors that more precisely meet the child's needs. Furthermore, parents may benefit from education regarding the possible influence of a child's difficulties with social understanding on their attempt to manage their own social behavior during demanding tasks. By acknowledging overt resistance as a lack of social contextual understanding on the part of the child, parents can be trained to address these issues early on. For example, by engaging in more explicit forms of reinforcement, parents may highlight for the child the importance of a behavior as it relates specifically to the social situation at hand.

## CHAPTER FOUR

### DISSERTATION CONCLUSION

The findings presented in each of the studies above illustrate the importance of addressing parenting stress as a means of improving social development in children with DD. When parenting stress is reduced, positive changes may occur in the parent-child relationship, which may promote more effective parenting behaviors. For example, reducing parent stress may result in reduced parent frustration with the parent-child relationship, which can ultimately promote improved levels of parent involvement (i.e., reduced parental detachment) during demanding tasks. Reducing stress may also decrease high levels of parent involvement, which could otherwise be expressed as intrusiveness. Parents may become more attuned to the child's specific needs, allowing them to provide the child with more appropriate assistance that enhances child self-regulation, as evidenced by increased compliance. These findings highlight the important effects of targeting parent stress, which may ultimately enhance parents' ability to engage in positive behaviors in a way that is more tailored to the child's needs. Lastly, while no relationship was found between improved compliance and improved self-control, results indicate that non-compliant behaviors are not necessarily reflective of dysregulation. Instead, non-compliance in children with DD expressed through overt-resistance may in fact represent behaviors perceived as regulated and adaptive in conflict situations with peers, but are maladaptive in parent demand situations. This finding highlights the importance of teaching children with DD appropriate behavioral responses in varying social contexts.

## REFERENCES

- Abidin, R. R. (1995). Parenting Stress Index Manual (3rd ed.). Odessa, FL: Psychological Assessment Resources, Inc
- Alink, L. R. a., Mesman, J., van Zeijl, J., Stolk, M. N., Juffer, F., Bakermans-Kranenburg, M. J., ... Koot, H. M. (2009). Maternal Sensitivity Moderates the Relation between Negative Discipline and Aggression in Early Childhood. *Social Development, 18*(1), 99–120. doi:10.1111/j.1467-9507.2008.00478.x
- Allen, N. B., Blashki, G., & Gullon, E. (2006). Mindfulness-based psychotherapies: A review of conceptual foundations, empirical evidence and practical considerations. *Australian and New Zealand Journal of Psychiatry, 40*, 285-294.
- Anastopoulos, A. D., Guevremont, D. C., Shelton, T. L., & DuPaul, G. J. (1992). Parenting stress among families of children with attention deficit hyperactivity disorder. *Journal of Abnormal Child Psychology, 20*, 503-520.
- Anthony, L. G., Anthony, B. J., Glanville, D. N., Naiman, D. Q., Waanders, C., & Shaffer, S. (2005). The relationships between parenting stress, parenting behaviour and preschoolers' social competence and behaviour problems in the classroom. *Infant and Child Development, 14*, 133-154.
- Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., et al. (2008). Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples. *Assessment, 15*, 329-342.
- Baker, B. L., Blacher, J., Crnic, K. A., & Edelbrock, C. (2002). Behavior problems and parenting stress in families of three-year-old children with and without developmental delays. *American Journal on Mental Retardation, 107*, 433-444.
- Baker, B. L., McIntyre, L. L., Blacher, J., Crnic, K., Edelbrock, C., & Low, C. (2003). Pre-school children with and without developmental delay: Behaviour problems and parenting stress over time. *Journal of Intellectual Disability Research, 47*, 217-230.
- Baker, J. K., Fenning, R. M., Crnic, K. A., Baker, B. L., & Blacher, J. (2007). Prediction of social skills in 6-year-old children with and without developmental delays: Contributions of early regulation and maternal scaffolding. *American Journal on Mental Retardation, 112*(5), 375-391.
- Barnett, M. A., Gustafsson, H., & Deng, M. (2012). Bidirectional associations among sensitive parenting, language development, and social competence. *Infant and Child Development, 393*(10), 374-393.



- Baxter, C., Cummins, R. A., & Yiolitis, L. (2000). Parental stress attributed to family members with and without disability: A longitudinal study. *Journal of Intellectual and Developmental Disability, 25*, 105–118.
- Bazzano, A., Wolfe, C., Zylowska, L., Wang, S., Schuster, E., Barrett, C., & Lehrer, D. (2010). Stress-reduction and improved well-being following a pilot community-based participatory Mindfulness-Based Stress-Reduction (MBSR) program for parents/caregivers of children with developmental disabilities. *Disability and Health Journal, 3*, e6-e7.
- Beck, A., Hastings, R. P., Daley, D., & Stevenson, J. (2004). Pro- social behaviour and behaviour problems independently predict maternal stress. *Journal of Intellectual and Developmental Disability, 29*(4), 339-349.
- Belsky, J., & Fearon, R. M. P., (2002). Infant-mother attachment security, contextual risk, and early development: A moderational analysis. *Development and Psychopathology, 14*, 293-310.
- Benn, R., Akiva, T., Arel, S., & Roeser, R. W. (2012). Mindfulness training effects for parents and educators of children with special needs. *Developmental Psychology, 48*, 1476-87.
- Birnie, K., Speca, M., & Carlson, L. E. (2010). Exploring self-compassion and empathy in the context of mindfulness-based stress reduction (MBSR). *Stress and Health, 26*(5), 359–371. doi:10.1002/smi.1305
- Blacher, J., & McIntyre, L. L. (2006). Syndrome specificity and behavioural disorders in young adults with intellectual disability: Cultural differences in family impact. *Journal of Intellectual Disability Research, 50*, 184-198.
- Blacker, M., Meleo-Meyer, F., Kabat-Zinn, J., & Santorelli, S. (2009). Stress Reduction Clinic Mindfulness-Based Stress Reduction (MBSR) Curriculum Guide. *Center for Mindfulness in Medicine, Health Care and Society, University of Massachusetts Medical School*.
- Block-Lerner, J., Adair, C., Plumb, J. C., Rhatigan, D. L., & Orsillo, S. M. (2007). The case for mindfulness-based approaches in the cultivation of empathy: does nonjudgmental, present-moment awareness increase capacity for perspective-taking and empathic concern? *Journal of marital and family therapy, 33*(4), 501–16. doi:10.1111/j.1752-0606.2007.00034.x
- Bockneck, E. L., Brophy-Herb, H. E., Fitzgerald, H., Burns-Jager, & Carolan, M. T. (2012). Maternal psychological absence and toddlers' social-emotional development: interpretations from the perspective of boundary ambiguity theory. *Family Process, 51*:527-541.

- Bögels, S., Stevens, J., & Majdandžić, M. (2011). Parenting and social anxiety: fathers' versus mothers' influence on their children's anxiety in ambiguous social situations. *Journal of child psychology and psychiatry, and allied disciplines*, 52(5), 599–606. doi:10.1111/j.1469-7610.2010.02345.x
- Bogels, S., Hoogstad, B., Van Dun, L., De Shutter, S., & Restifo, K. (2008). Mindfulness training for adolescents with externalizing disorders and their parents. *Behavioral and Cognitive Psychotherapy*, 36, 193-209.
- Bohlin, G., & Hagekull, B. (1987). “Good Mothering”: Maternal Attitudes and Mother-Infant Interaction. *Infant Mental Health Journal*, 8(4), 352–363.
- Bohnert, A. M., Crnic, K. A., & Lim, K. G. (2003). Emotional competence and aggressive behavior in school-age children. *Journal of Abnormal Child Psychology*, 31(1), 79-91.
- Bornstein, M. R., Bellack, A. S., & Hersen, M. (1977). Social skills training for unassertive children: A multiple baseline analysis. *Journal of Applied Behavior Analysis*. 10(2), 183-195.
- Briggs-Gowan, M. J., Carter, A. S., Skuban, E. M., & Horwitz, S. M. (2001). Prevalence of social- emotional and behavioral problems in a community sample of 1- and 2-year-old children. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 811–819.
- Brown, W. H. & Conroy, M. A. (2001). Social-emotional competence in young children with developmental delays: Our reflection and vision for the future. *Journal of Early Intervention*, 33(4), 310-321.
- Brown, M. A., McIntyre, L. L., Crnic, K.A., Baker, B. L., & Blacher J. (2011). Preschool children with and without developmental delays: risk, parenting, and child demandingness. *Journal of Mental Health Research in Intellectual Disabilities*. 4(3): 206-226.
- Campos, J. J., Frankel, C. B., & Camras, L. (2004). On the nature of emotion regulation. *Child development*, 75(2), 377–94. doi:10.1111/j.1467-8624.2004.00681.x
- Chiesa, A., & Serretti, A. (2009). Mindfulness-based stress reduction for stress management in healthy people: A review and meta-analysis. *The Journal of Alternative and Complementary Medicine*, 15, 593-600.
- Clark, R., Menna, R., & Manel, W. S. (2013). Maternal scaffolding and children’s social skills: a comparison between aggressive pre-schoolers and non-aggressive pre-schoolers. *Early Child Development and Care*, 183(5), 707-725.
- Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2<sup>nd</sup> ed.). Hillsdale, NJ: Erlbaum.

- Cohen, J., Cohen, P., West, S., & Aiken, L. (2002). Applied multiple regression/correlation analysis for the behavioral sciences (3rd ed.). Hillsdale, NJ: Erlbaum.
- Coldwell, J., Pike, A., & Dunn, J. (2006). Household chaos—links with parenting and child behaviour. *Journal of Child Psychology and Psychiatry*, *47*, 1116-1122.
- Crnic, K. A., Gaze, C., & Hoffman, C. (2005). Cumulative parenting stress across the preschool period: Relations to maternal parenting and child behaviour at age 5. *Infant and Child Development Special Issue: Parenting Stress and Children's Development*, *14*, 117-132.
- Davis, N. O., & Carter, A. S. (2008). Parenting stress in mothers and fathers of toddlers with autism spectrum disorders: Associations with child characteristics. *Journal of Autism and Developmental Disorders*, *38*, 1278–1291.
- Deater-Deckard, K., Dodge, K. A., Bates, J. E., & Pettit, G. S. (1998). Multiple risk factors in the development of externalizing behavior problems: Group and individual differences. *Development and Psychopathology*, *10*, 469-493.
- Deater-Deckard, K., & Scarr, S. (1996). Parenting stress among dual-earner mothers and fathers: are there gender differences? *Journal of Family Psychology*, *10*(1), 45-59.
- Donenberg, G., & Baker, B. L. (1993). The impact of young children with externalizing behaviors on their families. *Journal of Abnormal Child Psychology*, *21*, 179–98.
- Downey, G., & Coyne, J. C. (1990). Children of depressed parents: An integrative review. *Psychological Bulletin*, *108*, 50-76.
- Edwards, C. (1995). Parenting Toddlers. In M. Borstein (Ed.) Handbook of Parenting (Vol 1- Children and Parenting). Mahaw, New Jersey: Lawrence Erlbaum Associates.
- Eisenhower, A. S., Baker, B. L., & Blacher, J. (2005). Preschool children with intellectual disability: Syndrome specificity, behaviour problems, and maternal well-being. *Journal of Intellectual Disability Research*, *49*, 657-671.
- Eisenhower, A. S., Baker, B. L., & Blacher, J. (2009). Children's delayed development and behavior problems: Impact on mothers' perceived physical health across early childhood. *Social Science & Medicine*, *68*, 89–99.
- Eisenberg, N., Fabes, R. A., Bernzweig, J., Karbon, M., Poulin, R., & Hanish, L. (1993). The relations of emotionality and regulation to preschoolers' social skills and sociometric status. *Child Development*, *64*, 1418-1438.

- Eisenberg, N., Fabes, R. A., Guthrie, I. K., & Reiser, M. (2000). Dispositional emotionality and regulation: Their role in predicting quality of social functioning. *Journal of Personality and Social Psychology*, 78(1), 136-157.
- Eisenberg, N., Fabes, R. A., Karbon, M., Murphy, B. C., Wosinski, M., Polazzi, L., Carlo, G., & Juhnke, C. (1996). The relations of children's dispositional prosocial behavior to emotionality, regulation, and social functioning. *Child Development*, 67, 974-992.
- Ekas, N., McDonald, N., & Messinger, D. (In preparation). The emergence of child compliance behavior and the association with ASD symptom severity.
- Emerson, E. (2003). Mothers of children and adolescents with intellectual disability: social and economic situation, mental health status, and self-assessed social and psychological impact of the child's difficulties. *Journal of Intellectual Disability Research*, 47, 385-399.
- Erickson, S. J., Duvall, S. W., Fuller, J. Schrader, R., MacLean, P. (2013). Differential associations between maternal scaffolding and toddler emotion regulation in toddlers born preterm and full term. *Early Human Developmental*. 89(9), 699-704.
- Erickson, F., & Schultz, J. (1997). When is a context? Some issues and methods in the analysis of social context. In Cole, M., Engestrom, Y., & Vasquez, O. (Ed.) Mind, Culture, and Activity. Cambridge, UK: Cambridge University Press.
- Esser, G., Dinter, R., Jörg, M., Rose, F., Villalba, P., Laucht, M., et al. (1993). Significance and determinants of early mother-child interaction. *Zeitschrift für Psychosomatische Medizin und Psychoanalyse*, 39, 246-264.
- Estes, A., Munson, J., Dawson, G., Koehler, E., Zhou, X.-H., & Abbott, R. (2009). Parenting stress and psychological functioning among mothers of preschool children with autism and developmental delay. *Autism: The International Journal of Research and Practice*, 13, 375-387.
- Fabes, R. A., Eisenberg, N., Jones, S., Smith, M., Guthrie, I., Poulin, R., ... Friedman, J. (1999). Regulation, Emotionality, and Preschoolers' Socially Competent Peer Interactions. *Child development*, 70(2), 432-442.
- Feldman, R., & Klein, S. K., (2003). Toddlers' Self-Regulated Compliance to Mothers, Caregivers, and Fathers: Implications for Theories of Socialization. *Developmental Psychology*, 39(4), 680-692.
- Fenning, R. M., Baker, B. L., & Juvonen, J. (2011). Emotion discourse, social cognition, and social skills in children with and without developmental delays. *Child Development*, 82(2), 717-731.

- Fenning, R. M., & Baker, J. K. (2012). Mother-child interaction and resilience in children with early developmental risk. *Journal of Family Psychology*, 26(3), 411-420.
- Floyd F. J., Harter K. S. M., & Costigan C. L. (2004). Family problem-solving with children who have mental retardation. *American Journal on Mental Retardation*, 109: 507–524. [PubMed: 15471516]
- Fonseca, A., Nazaré, B., & Canavarro, M. C. (2013). Parental psychological distress and confidence after an infant's birth: The role of attachment representations in parents of infants with congenital anomalies and parents of healthy infants. *Journal of Clinical Psychology in Medical Settings*, 20(2), 143-55.
- Frank, S., Hole, C. B., Jacobsen, S., Justkowski, R., & Huyck, M. (1986). Psychological predictors of parents' self confidence and control and self-versus child-focused gratifications. *Developmental Psychology*, 22(3), 34-355.
- Garland, E., Gaylord, S., & Park, J. (2009). The role of mindfulness in positive reappraisal. *Explore (NY)*, 5(1), 37-44.
- Gergely, G., & Watson, J. (1996). The social biofeedback theory of parental affect-mirroring: The development of emotional self-awareness and self-control in infancy. *International Journal of Psychoanalysis*, 77, 1181–1212.
- Gilliam, J. E. (2006) Gilliam Autism Rating Scale – Second Edition. Austin, TX: PRO-ED Inc.
- Glidden, L. M., & Schoolcraft, S. A. (2003). Depression: Its trajectory and correlates in mothers rearing children with intellectual disability. *Journal of Intellectual Disability Research Special Issue on Family Research*, 47, 250-263.
- Gondoli, D. M., & Silverberg, S. B. (1997). Maternal emotional distress and diminished responsiveness: the mediating role of parenting efficacy and parental perspective taking. *Developmental psychology*, 33(5), 861–8. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/9300219>
- Green, S. & Baker, B. (2011). Parents' emotion expression as a predictor of child's social competence: Children with or without intellectual disability. *Journal of Intellectual Disability Research*, 5(3), 324-338.
- Greene J. G., Fox N. A., & Lewis M. (1983). The relationship between neonatal characteristics and three-month mother-infant interaction in high-risk infants. *Child Development*. 54(5):1286–1296. [PubMed: 6354634]
- Gresham, F. M. & Elliott, S. N. (2008). Social Skills Improvement System Rating Scales. Minneapolis, MN: NCS Pearson.

- Guisti, L., Mirsky, E., Dickenstein, S., & Seifer, R. (1997). Clean-Up Task Coding Manual Providence Family Study Version 1.
- Guralnick, M. J. (1999). Family and child influences on the peer-related social competence of young children with developmental delays. *Mental Retardation and Developmental Disabilities Research Reviews*, 5, 21–29.
- Guralnick, M. J., Neville, B., Connor, R. T., & Hammond, M. A. (2003). Family factors associated with the peer social competence of young children with mild delays. *American Journal on Mental Retardation*, 108(4), 272-287.
- Hart, C. H., DeWolf, D. M., Wozniak, P., & Burts, D. C. (1992). Maternal and paternal disciplinary styles: relations with preschoolers' playground behavioral orientations and peer status. *Child Development*, 63(4), 879-892.
- Hassall, R., Rose, J., & McDonald, J. (2005). Parenting stress in mothers of children with an intellectual disability: The effects of parental cognitions in relation to child characteristics and family support. *Journal of Intellectual Disability Research*, 49(Pt 6), 405-18.
- Hastings, R. P. (2003). Child behaviour problems and partner mental health as correlates of stress in mothers and fathers of children with autism. *Journal of Intellectual Disability Research*, 47(4-5), 231-237.
- Hastings, R. P., & Beck, A. (2004). Practitioner Review: Stress intervention for parents of children with intellectual disabilities, *Journal of Child Psychology and Psychiatry*, 45(8), 1338-1349.
- Hastings, R. P., Daley, D., Burns, C., & Beck, A. (2006). Maternal distress and expressed emotion: Cross-sectional and longitudinal relationships with behavior problems of children with intellectual disabilities. *American Journal on Mental Retardation*, 111, 48-61.
- Hauser-Cram, P., Warfield, M. E., Shonkoff, J. P., & Krauss, M. W. (2001). Children with disabilities: A longitudinal study of child development and parent well-being. *Monographs of the Society for Research in Child Development*, 66, 1-131.
- Hauser-Cram, P., Warfield, M. E., Krauss, M. W., Shonkoff, J. P., Upshur, C. C., & Sayer, A. (1999). Family influences on adaptive behavior in young children with Down Syndrome. *Child Development*, 70, 979-989.
- Hengameh, K. & Mary, E. B. (2000). Maternal Scaffolding in the child's zone of proximal development across tasks: Cross-cultural perspectives. *Journal of Research in Childhood Education*, 15(1).
- Herring S., Gray K, Taffe J., Tonge B., Sweeney D., & Einfeld S. (2006). Behaviour and emotional problems in toddlers with pervasive developmental disorders and

- developmental delay: associations with parental mental health and family functioning. *Journal of Intellectual Disability Research*. 50:874–882. [PubMed: 17100948]
- Hill, N. E., & Bush, K. R. (2001). Relationships between parenting environment and children's mental health among African American and European American mothers and children. *Journal of Marriage and Family*, (63), 954–966.
- Hoffman, C. D., Sweeney, D. P., Hodge, D., Lopez-Wagner, M. C., & Looney, L. (2009). Parenting stress and closeness: Mothers of typically developing children and mothers of children with autism. *Focus on Autism and Other Developmental Disabilities*, 24(3), 178–187.
- Hoffman, C., Crnic, K. A., & Baker, J. K. (2006). Maternal depression and parenting: implications for children's emergent emotion regulation and behavioral functioning. *Parenting Science and Practice*, 6(4), 271-295.
- Jarvis, P. A., & Creasy, G. L. (1991). Parental stress, coping, and attachment in families with an 18 month old infant. *Infant Behaviour and Development* 14, 383–395.
- Johnston, C., Hessel, D., Blasey, C., Eliez, S., Erba, H., Dyer-Friedman, J., Glaser, B., & Reiss, A.L. (2003). Factors associated with parenting stress in mothers of children with fragile X syndrome. *Developmental and Behavioral Pediatrics*, 24(4), 267-275.
- Johnston, C., & Mash, E. J. (1989). A measure of parenting satisfaction and efficacy. *Journal of Clinical Child Psychology*, 18(2), 167-175.
- Johnston, C., & Mash, E. J. (2001). Families of children with attention-deficit/hyperactivity disorder: Review and recommendations for future research. *Clinical Child and Family Psychology Review*, 4, 183-207.
- Jones, E. J. H., Webb, S. J., Estes, A., & Dawson, G. (2013). Rule learning in autism: The role of reward type and social context. *Developmental Neuropsychology* 38(1), 58-77. DOI:[10.1080/87565641.2012.727049](https://doi.org/10.1080/87565641.2012.727049)
- Jones, T. L., & Prinz, R. J. (2005). Potential roles of parental self-efficacy in parent and child adjustment: A review. *Clinical psychology review*, 25(3), 341–63.
- Joosen, K. J., Mesman, J., Bakermans-Kranenburg, M. J., & van Ijzendoorn, M. H. (2012). Maternal sensitivity to infants in various settings predicts harsh discipline in toddlerhood. *Attachment and Human Development*, 14(2), 101-117.
- Kabat-Zinn, J., Massion, A. O., Kristeller, J., & Peterson, L. G. (1992). Effectiveness of a meditation-based stress reduction program in the treatment of anxiety disorders. *The American Journal of Psychiatry*, 149, 936-943.

- Kamphaus, R. W., & Reynolds, C. R. (2006). Parenting Relationship Questionnaire. Minneapolis, MN: NCS Pearson.
- Keenan, K. (2000). Emotion dysregulation as a risk factor child psychopathology. *Clinical Psychology Science and Practice*, 7(4), 418-434.
- Kermani, H., & Brenner, M. E. (2000). Maternal scaffolding in the child's zone of proximal development across tasks: Cross-cultural perspectives. *Journal of Research in Childhood Education*, 15(1).
- Kersh, J., Hedvat, T. T., Hauser-Cram, P., & Warfield, M. E. (2006). The contribution of marital quality to the well-being of parents of children with developmental disabilities. *Journal of Intellectual Disability Research*, 50, 883-893.
- Kim, E. S. & Kim, B. S. (2009). The structural relationships of social support, mother's psychological status, and maternal sensitivity to attachment security in children with disabilities. *Asia Pacific Education Review*, 10(4), 561-573.
- Kochanska, G., Coy, K. C., & Murray, K. T. (2001). The development of self-regulation in the first four years of life. *Child development*, 72(4), 1091-1111. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/11480936>
- Kochanska, G., & Aksan, N. (1995). Mother-child mutually positive affect, the quality of child compliance to requests and prohibitions and maternal control as correlates of early internalization. *Child Development*, 55, 236-254.
- Kochanska, G., Murray, K. T., & Harlan, E. (2000). Effortful control in early childhood: Continuity and change, antecedents, and implications for social development. *Developmental Psychology*, 36, 220-232.
- Kottner, J., Audige, L., Brorson, S., Donner, A., Gajewski, B. J., Hrobjartsson, A., Roberts, C., Shoukri, M., & Streiner, D. L. (2011). Guidelines for reporting reliability and agreement studies (GRRAS) were proposed. *Journal of clinical Epidemiology*, 64(1), 96-106.
- Kopp, C. B. (1982). Antecedents of self-regulation: a developmental perspective. *Developmental Psychology*, 18(2), 199-214.
- Lempers, J. D., Clark-Lempers, D., & Simons, R. L. (1989). Economic hardship, parenting, and distress in adolescences. *Child Development*, 60, 25-39.
- Lengua, L. J., Honorado, E., & Bush, N. R. (2011). Contextual risk and parenting as predictors of effortful control and social competence in preschool children. *Journal of Applied Developmental Psychology*, 28(1), 40-55.



- Liu, C. C., Chen, Y. C., Yeh, Y. P., & Hsieh, Y. S. (2012). Effects of maternal confidence and competence on maternal parenting stress in newborn care. *Journal of Advanced Nursing*, 68(4), 908–918.
- Mantymaa M., Puura K., Luoma I., Salmelin R. K., Tamminen T. (2004). Early mother-infant interaction, parental mental health and symptoms of behavioral and emotional problems in toddlers. *Infant Behavior & Development*. 27(2):134-149.
- McIntyre L. L. (2008). Parent training for young children with developmental disabilities. Randomized controlled trial. *American Journal on Mental Retardation*. 113:356–368. [PubMed:18702556]
- Melamed, B. G. (2002). Parenting the ill child. In: Bornstein, M. H., editor. Handbook of parenting. (Vol. 5). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Merrell, K. W., & Holland, M. L. (1997). Social-emotional behavior of preschool-age children with and without developmental delays. *Research in Developmental Disabilities*, 18, 393-405.
- Neece, C. L. (2013), Mindfulness-Based Stress Reduction for parents of young children with developmental delays: Implications for parental mental health and child behavior problems. *Journal of Applied Research in Intellectual Disabilities*. 1-13
- Neece, C. L. & Baker, B. L. (2008). Predicting maternal parenting stress in middle childhood: The roles of child intellectual status, behavior problems, and social skills. *Journal of Intellectual Disability Research*, 52, 1114-1128.
- Neece, C. L., Green, S. A., & Baker, B. L. (2012). Parenting stress and child behavior problems: A transactional relationship across time. *American Journal on Intellectual and Developmental Disabilities*, 117, 48-66.
- Neitzel, C., & Stright, A. D. (2003). Mother's scaffolding of children's problem solving: Establishing a foundation of academic self-regulatory competence. *Journal of Family Psychology*, 17(1), 147-159.
- Nieman, P., Calgary, A., Shea, S. (2004). Effective discipline for children. *Pediatric Child Health*, 9(1), 37–41.
- Oelofsen, N., & Richardson, P. (2006). Sense of coherence and parenting stress in mothers and fathers of preschool children with developmental disability. *Journal of Intellectual & Developmental Disability*, 31, 1–12.
- Ooi, Y.P., Ang, R.P., Fung, D.S.S., Wong, G. & Cai, Y. (2006). The impact of parent-child attachment on aggression, social stress and self-esteem. *School Psychology International*, 27, 552-566

- Orsmond, G. I., Seltzer, M. M., Krauss, M. W., & Hong, J. (2003). Behavior problems in adults with mental retardation and maternal well-being: Examination of the direction of effects. *American Journal on Mental Retardation*, *108*, 257-271.
- Pettit, G. S., Bates, J. E., & Dodge, K. A. (1997). Supportive parenting, ecological context, and children's adjustment: A seven-year longitudinal study. *Child development*, *68*(5), 908-923.
- Pisula, E. (2007). A comparative study of stress profiles in mothers of children with autism and those of children with Down's syndrome. *Journal of Applied Research in Intellectual Disabilities*, *20*, 274-278.
- Pfiffner, L. J., McBurnett, K., Rathouz, P. J., & Judice, S. (2005). Family correlates of oppositional and conduct disorders in children with attention deficit/hyperactivity disorder. *Journal of Abnormal Child Psychology*, *33*(5), 551-563.
- Placone-Willey, P. M. (2002). A curriculum for mindful parenting: A model development dissertation. *Dissertation Abstracts International*, *63*, 586B.
- Ratto, A. B., Turner-Brown, L., Rupp, B.M., Mesibov, G. B., & Penn, D. L. (2011). Development of the contextual assessment of social skills (CASS): A role play measure of social skills for individual's with high-functioning autism. *Journal of Autism and Developmental Disorders*. *41*, 1277-1286.
- Rhoades, B. L., Greenberg, M. T., & Domitrovich, C. E. (2009). The contribution of inhibitory control to pre-schoolers' socio-emotional competence. *Journal of Applied Developmental Psychology*, *30*(3), 310-320.
- Robinson, E. A., Eyberg, S. M., & Ross, A. W. (1980). The standardization of an inventory of child conduct problem behaviors. *Journal of Clinical Child & Adolescent Psychology*, *9*, 22-28.
- Rothbart, M. K., & Bates, J. E. (1998). Temperament. In W. Damon & N. Eisenberg (Eds.), *Handbook of child psychology: Vol. 3 Social, Emotional and Personality Development*, (pp. 105-176). New York: Wiley.
- Sameroff, A. J. (1998). Environmental risk factors in infancy. *Pediatrics*, *102* (5), 1287-1292.
- Sameroff, A. J. (Ed.) (2009). The Transactional Model of Development: How Children and Contexts Shape Each Other. Washington, DC: American Psychological Association.
- Sanders, J. L., & Morgan, S. B. (1997). Family stress and adjustment as perceived by parents of children with autism or Down syndrome: Implications for intervention. *Child & Family Behavior Therapy*, *19*, 15-32.

- Sepa, A., Frodi, A., & Ludvigsson, J. (2004). Psychosocial correlates of parenting stress, lack of support and lack of confidence/security. *Scandinavian Journal of Psychology*, 45(2), 169–79.
- Shaffer, A., Suveg, C., Thomassin, K., & Bradbury, L. L. (2012). Emotion socialization in the context of family risks: Links to child emotion regulation. *Journal of Child and Family Studies*, 21, 917-924.
- Shoda, Y., Mischel, W., & Peak, P. K. (1990). Predicting adolescent cognitive and self-regulatory competencies from preschool delay of gratification: Identifying diagnostic conditions. *Developmental Psychology*. 26(6), 978-986.
- Shrout, P. E., & Fleiss, J. L. (1979). Intraclass correlations: uses in assessing rater reliability. *Psychological bulletin*, 86(2), 420–8. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/18839484>
- Shumow, L., & Lomax, R. (2002). Parental Efficacy: Predictor of Parenting Behavior and Adolescent Outcomes. *Parenting: Science and Practice*, 2(2), 127–150.
- Singh, N. N., Lancioni, G. E., Winton, A. S. W., Singh, J., Singh, A. N., Adkins, A. D., & Wahler, R. G. (2010). Training in mindful caregiving transfers to parent–child interactions. *Journal of Child and Family Studies*, 19, 167-174.
- Singh, N. N., Lancioni, G. E., Winton, A. S., Fisher, B. C., Wahler, R. G., Mcleavey, K., ... & Sabaawi, M. (2006). Mindful parenting decreases aggression, noncompliance, and self-injury in children with autism. *Journal of Emotional and Behavioral Disorders*, 14, 169-177.
- Singh, N. N., Singh, A. N., Lancioni, G. E., Singh, J., Winton, A. S. W., & Adkins, A. D. (2010). Mindfulness training for parents and their children with ADHD increases the children’s compliance. *Journal of Child and Family Studies*, 19, 157-166.
- Singh, N. N., Lancioni, G. E., Winton, A.S., Singh, J., Curtis, J. W., Wahler, R. G., & McLeavey K. M. (2007). Mindful parenting decreases aggression and increases social behavior in children with developmental disabilities. *Behavior Modification*, 31, 749 – 771.
- Shin, H., Park, Y.-J., Ryu, H., & Seomun, G.-A. (2008). Maternal sensitivity: a concept analysis. *Journal of advanced nursing*, 64(3), 304–314.
- Stright, A.D., Herr M.Y., & Neitzel, C. (2009). Maternal scaffolding of children’s problem solving and children’s adjustment in kindergarten: Hmong families in the United States. *Journal of Educational Psychology*, 101, 207–218.
- Suárez, L. M., & Baker, B. L. (1997). Child externalizing behavior and parents’ stress: The role of social support. *Family Relations*, 46, 373.

- Teti, D. M., Nakagawa, M., Das, R., & Wirth, O. (1991). Security of attachment between preschoolers and their mothers: Relations among social interaction, parenting stress, and mother's sorts of the attachment Q-Set. *Developmental Psychology*, 27(3), 440-447.
- Tracy, L. S., Eisenberg, N., Gaertner, B., Popp, T., Smith, C. L., Kupfer, A., Greving, K., Liew, J., & Hofer, C. (2007). Relations of maternal socialization and toddlers' effortful control to children's adjustment and social competence. *Developmental Psychology*, 43(5), 1170-1186.
- Yamagata, S., Takahashi, Y., Ozaki, K., Fujisawa, K. K., Nonaka, K., Ando, J. (2013). Bidirectional influences between maternal parenting and children's peer problems: A longitudinal monozygotic twin difference study. *Developmental Science*, 16(2), 249-259.
- Walden, T. A., & Smith, Maureen, C. (1997). Emotion Regulation. *Motivation and Emotion*, 21(1), 7-25.
- Webster, R. I., Majnemer, A., Platt, R. W., & Shevell, M. I. (2008). Child health and parental stress in school-age children with a preschool diagnosis of developmental delay. *Journal of Child Neurology*, 23, 32-8.
- Wilson, B. J., Fernandes-Richards, S., Aarskog, C., Osborn, T. & Capetillo, D. (2007). The role of emotion regulation in the social problems of boys with developmental delays. *Early Education and Development*, 18(2), 199-220.
- Woolfson, L., & Grant, E. (2006). Authoritative parenting and parental stress in parents of pre-school and older children with developmental disabilities. *Child: Care, Health and Development*, 32(2) , 177-84.