9-2018

The Role of Therapeutic Processes within MBSR for Parents of Children with Developmental Delays

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School of Behavioral Health
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The Role of Therapeutic Processes within MBSR for Parents of Children with Developmental Delays

by

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A Thesis submitted in partial satisfaction of
the requirements for the degree
Master of Arts in Clinical Psychology

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September 2018

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

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ACKNOWLEDGEMENTS

I would like to express my deepest love and appreciation to God, the Father of all Creation, the Author of my salvation, and my Teacher of my soul; my Lord, Jesus Christ, who's love and sacrifice has resurrected me and guided me to new life; and my Comforter, the Holy Spirit, who carries and protects me. It is with this humblest acknowledgement that I wish to honor The Father for everything He has provided me and those He has given to me in love.

To my wife, Chantelle Marie Boostrom, your fierce spirit and tender heart has been an inspiration to me and has empowered me to endure this difficult time. Knowing you, loving you, and having you beside me through this process is something I will always remember; I love you with all that I am, and I am forever yours. To my daughter Mia, thank you for your precious love and for sharing your world and your heart with me; may I always be the Daddy that you believe I am. To my mother, Madilyn Boostrom, and my father, Steven Boostrom, thank you for always believing in me. You have nurtured and cultivated my life and my spirit through every season, and I am forever indebted to your incredible love for me. To my aunt, Elaine Haro, thank you for supporting my family during this process and for always keeping us in your heart and in prayers – may all your prayers, wishes, and dreams come true! To all of my family and friends, thank you for sharing your lives with me. While I have come to learn that I am not in control how life evolves, I am glad for the ways in which our lives have intersected and times we have shared together. You have all contributed in significant and special ways to the person I am today; I hope that each and every one of you are proud of who I am, because you are forever a part of me.

To my mentor, Dr. Cameron Neece, thank you for allowing me to be a part of the amazing opportunities you create for the families we serve and the students you work with. I am forever indebted to your kindness, your clear mind, and your phenomenal strength and endurance. To my friend, Neilson Chan, thank you for your faith, your ability, your companionship through the multitude of challenges we've faced during our graduate studies. Sharing in this process with you has blessed me in ways that I cannot express; thank you for who you are. To my colleagues in the Child and Family Lab, thank you for all of your extraordinary hard work, dedication, and service. You all of proven yourselves to be highly valuable, capable individuals and professionals and I am fortunate and proud to be counted amongst you.

Lastly, I would like to thank the precious child within me. Thank you for your beautiful spirit. Thank you for taking on this incredible journey and thank you for always remembering that life is worth living. I am so proud of you. I am so thankful for the life you have chosen to live and the person you have decided to become. May you always be blessed and may you always be counted amongst the faithful. I love you.

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ABBREVIATIONS

DD	Developmental Delays
MBSR	Mindfulness-Based Stress Reduction
MAPS	Mindful Awareness for Parenting Stress
GQ^{-}	Group Questionnaire
FFMQ	Five Facets of Mindfulness Questionnaire
PSI-SF	Parent Stress Index – Short Form
CBCL	Child Behavior Checklist

ABSTRACT OF THE THESIS

The Role of Therapeutic Processes within MBSR for Parents of Children with Developmental Delays

by

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Loma Linda University, June 2019
Dr. Cameron L. Neece, Chairperson

Parents of children with developmental delays (DD) report higher levels of stress than parents of typically developing children, and Mindfulness-Based Stress Reduction (MBSR) has proven effective at reducing stress in parents of children with DD. However, therapeutic processes that have been shown to be responsible for therapeutic change across treatment modalities have not been investigated within this context. This pilot study utilizes archival data from two phases of the Mindful Awareness for Parenting Stress Project to investigate the role of therapeutic processes within a MBSR intervention for parents of children with DD. Results indicated that therapeutic process variables were not significant predictors of treatment outcomes within the MBSR treatment setting (*p*s > .05). Study limitations and future directions for exploring therapeutic processes within the MBSR are discussed.

CHAPTER 1

INTRODUCTION

Parents of children with developmental delays (DD) are a high-risk group. They have been shown to have higher levels of stress than parents of typically developing children (Dabrowska & Pisula, 2010, Gupta, 2007, Neece, Green, & Baker, 2012), with many reporting clinical levels of stress (Davis & Carter, 2008; Tomanik, Harris, & Hawkins, 2004). Mindfulness-based Stress Reduction (MBSR; Kabat-Zinn, 1990), the oldest and most empirically supported mindfulness-based intervention, has been shown to be effective at reducing stress in this population (Bazzano et al., 2013; Dykens, Fisher, Taylor, Lambert, & Miodrag, 2014; Minor, Carlson, Mackenzie, Zernicke, & Jones, 2006; Neece, 2014), but less is known regarding how or why it works. MBSR, as well as other mindfulness-based interventions, have continued to grow in popularity over the past few decades due to an increasingly broad base of empirical evidence demonstrating their effectiveness in treating chronic pain, stress, depression, anxiety, disordered eating behavior, and a variety of medical symptoms across a large array of patient populations (Baer, 2003; Grossman, Niemann, Schmidt, & Walach, 2004). Further, therapist mindfulness and mindfulness-based therapist training has been shown to be associated with improved patient outcomes (Grepmair et al., 2007) and an improved therapeutic alliance (Ryan, Safran, Doran, & Muran, 2012) in psychotherapy. While mindfulness has been shown to be associated with an improved therapeutic relationship, little research has investigated the role of therapeutic processes within mindfulness-based interventions.

Therapeutic Processes in Group Treatment

The therapeutic relationship is an important part of the "common factors" approach to therapy, which states that there exist therapist and client factors responsible for therapeutic change that are irrespective of treatment modality. Lambert and Barley's (2001) landmark review of therapeutic processes found that the therapeutic relationship accounts for up to 30% of patient outcomes. The therapeutic alliance, a component of the therapeutic relationship, has been found to account for 26% in patient outcomes (Horvath & Symonds, 1991), and group cohesion, a group therapeutic construct that measures an individual's sense of "belongingness" in a group, consistently demonstrates a strong relationship to patient outcomes across studies (Burlingame, Fuhriman, & Johnson, 2001). Other group therapeutic constructs, including group alliance and group climate, also demonstrate a similar significant relationship to patient outcomes (Marziali, Munroe-Blum, & McCleary, 1997; Ogrodniczuk & Piper, 2003). As a whole, results surrounding these therapeutic processes suggest a strong association to patient outcomes (Johnson, Burlingame, Olsen, Davies, & Gleave, 2005).

While there is a general acceptance that therapeutic processes are an essential element of change, a lack of consensus regarding the conceptualization of therapeutic constructs has hindered scientific understanding and investigation. Johnson and colleagues (2005) model for group and individual therapeutic processes, which we will be using it in the present study, attempts to integrate various therapeutic constructs into a simplified factor structure (See *Figure 1*). It is comprised of three factors: positive bonding relationship (cohesion, engagement, and empathy), positive working relationship (agreement on tasks and goals), and negative relationship (conflict and empathetic

failure); and is measured across three levels: member-to-member, member-to-leader, and member-to-group. No research has directly tested the utility of this model in predicting patient outcomes; however, the operationalized factor structure was developed from structural equation modeling of several well-established measures of various therapeutic processes. These measures include the Empathy Scale (Burns & Auerbach, 1996), the cohesion scale of the Therapeutic Factors Inventory (Lese & McNair-Semands, 2000), the Group Climate Questionnaire (MacKenzie, 1983), and the Working Alliance Inventory (Horvath & Greenburg, 1989), which have all been extensively researched regarding their predictive relationship to patient outcome in group therapy (Brown & O'Leary, 2001; Hurley & Rosenberg, 1990; Ogrodniczuk & Piper, 2003; Yalom & Lescsz, 2005). Additionally, the final model factor structure has been replicated and upheld across inpatient, outpatient, and nonclinical samples in the United States, Norway, and Germany (Bakali, Baldwin, & Lorentzen, 2009; Bormann & Strauss, 2007; Krogel et al., 2013), indicating good model validity.

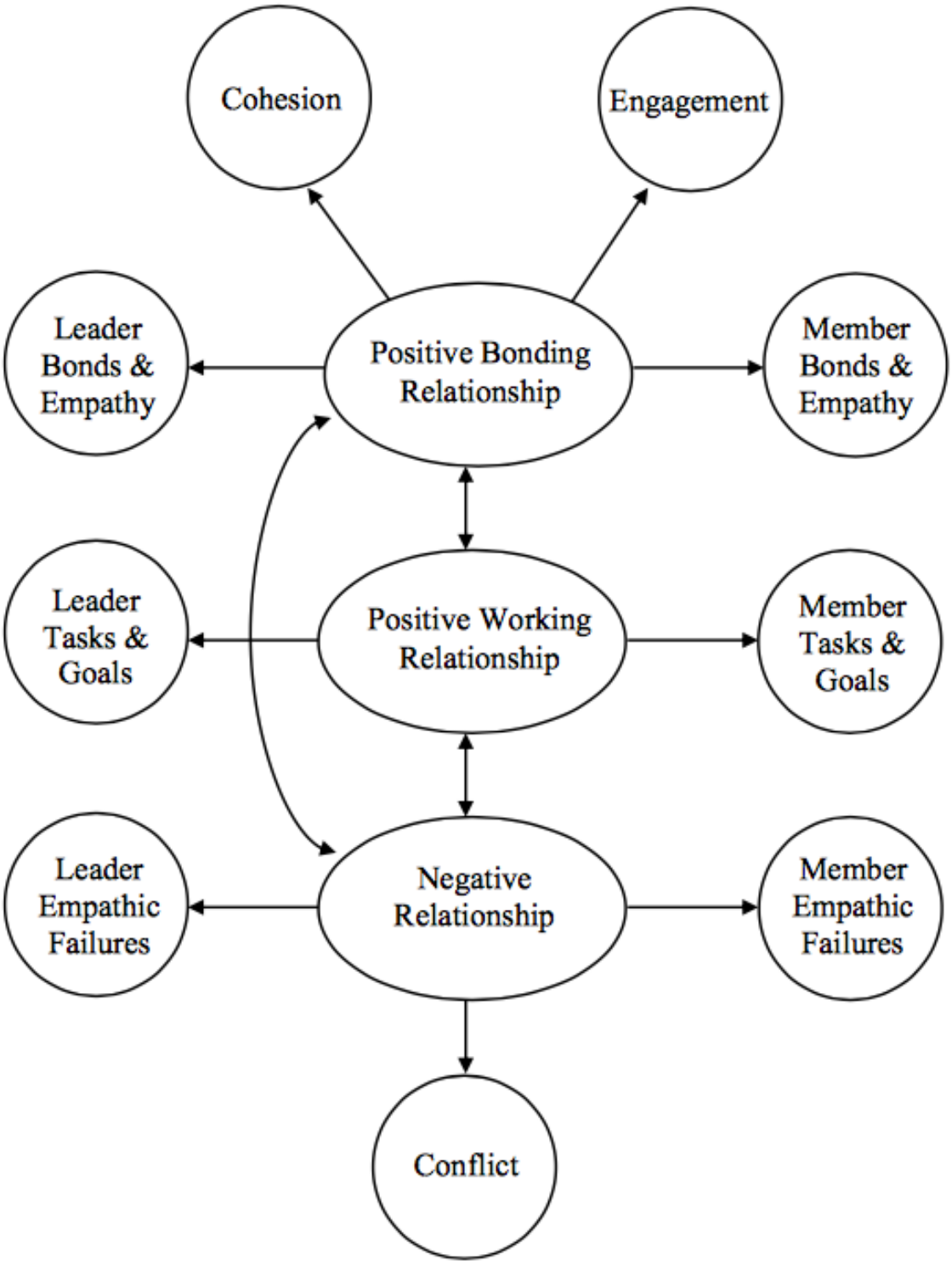

Figure 1. Johnson's model of therapeutic processes

Mindfulness-Based Stress Reduction and Therapeutic Processes

Mindfulness-based interventions have a broad empirical basis for their effectiveness in improving patient outcomes. More specifically, Mindfulness-Based Stress Reduction (MBSR) – a manualized, eight-week, mindfulness-based intervention – has been shown to significantly reduce stress, chronic pain, depression, anxiety, disordered eating behavior, and a variety of medical symptoms (Baer, 2003; Grossman, Niemann, Schmidt, & Walach, 2004). Created in 1979 by Jon Kabat-Zinn at the University of Massachusetts Medical Center (Kabat-Zinn, 1990), MBSR is the oldest and most empirically supported mindfulness-based intervention. It is the template for a wide array of mindfulness-based intervention interventions, such as Mindfulness-Based Cognitive Therapy, Mindfulness-Based Relapse Prevention, Mindful Parenting, and others. Its broad base of influence and support, along with its high level of standards of administration (Center for Mindfulness, 2017), makes MBSR the epitome of mindfulness-based interventions.

Mindfulness refers to "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, pg. 145) that has long been believed to promote health and well-being (Brown & Ryan, 2003). According to Baer et al. (2006; 2008), there are five facets to the mindfulness construct, including (1) observing (2) describing, (3) acting with awareness, (4) nonjudging of inner experience, and (5) nonreactivity of inner experience, which are associated with meditation experience, psychological symptoms, and well-being. In the West, mindfulness meditation was introduced as universal application of traditional Buddhist meditative principles to increase

mindfulness and improve outcomes for chronic pain patients (Kabat-Zinn, 2003). Mindfulness meditation, and mindfulness-based interventions, have become increasingly popular over the past few decades and, like various therapeutic processes, have been shown to predict improvements in patient outcomes across a variety of populations, both clinical and non-clinical (Baer, 2003; Chiesa & Serretti, 2009). Furthermore, both client and therapist mindfulness have been associated with improved ratings of the therapeutic alliance (Bowen & Kurz, 2012; Ryan, Safran, Doran, & Muran, 2012), and participation in an MBSR intervention has shown to increase participant empathy (Shapiro, Schwartz, & Bonner, 1998), a primary component of the therapeutic relationship. While there is a substantial body of research regarding mindfulness' association to both therapeutic processes and patient outcomes, a search of the literature revealed few studies investigating the role of therapeutic processes within mindfulness-based intervention settings (Bowen & Kurz, 2012; Goldberg, Davis, & Hoyt, 2013).

Families of Children with Developmental Delays and Mindfulness-Based Stress Reduction

The risks associated with families of children with developmental delays have been well established in the literature. Parents of children with developmental delays generally experience higher levels of stress compared to parents of typically developing children and children with other disabilities (Dabrowska & Pisula, 2010, Gupta, 2007, Neece, Green, & Baker, 2012), with many of them reporting stress levels in the clinically significant range (Davis & Carter, 2008; Tomanik, Harris, & Hawkins, 2004). Further, children with developmental delays on average have higher levels of emotional and

behavioral problems than typically developing children (Baker et al., 2003; Emerson & Einfeld, 2010) as well as social skills deficits (Merrell & Holland, 1997). These risk factors compound one another in these families, as studies show that parent stress and child behavior problems exhibit a bidirectional relationship (Baker et al., 2003; Neece et al., 2012; Woodman, Mawdsley, & Hauser-Cram, 2015), such that parenting stress predicts later child behavior problems (Herring et al., 2006; Woodman, 2014), and child behavior problems predict later parenting stress (Baker et al., 2002; Osborne & Reed, 2009).

Recently, researchers have investigated mindfulness and MBSR as a stress-reduction intervention for families of children with developmental delays. Mindfulness training has been found to significantly improve parenting stress and parenting satisfaction, (Singh et al., 2007), as well as improve child social skills, aggression, and compliance (Singh et al., 2007; Singh et al., 2014, Singh et al., 2010). MBSR interventions, in particular, have been shown to significantly improve parent stress, anxiety, depression, life satisfaction, sleep, well-being, and mood disturbances (Bazzano et al., 2013; Dykens et al., 2014; Minor et al., 2006; Neece, 2014), as well as improve child attention problems and ADHD symptomatology (Neece, 2014). Though research on MBSR, and mindfulness training in general, has shown clear evidence for the effectiveness of mindfulness training this population, little is known as to how or why it works.

Current Study

While growing evidence points to MBSR as an effective treatment strategy for parents of children with developmental delays, current explanations for how MBSR works are incomplete. Some studies have found that formal home practice is the active therapeutic ingredient in a standardized MBSR intervention (Carmody & Baer, 2008), while others have found that it is informal practice (Shapiro, Bootzin, Figueredo, Lopez, & Schwartz, 2003), class attendance (Speca, Carlson, Goodey, & Angen, 2000), or even trait mindfulness (Dobkins & Zhao, 2008; Nyklíček & Kuijpers, 2008) that is responsible. Additionally, variation in MBSR study outcomes (Bazzano et al., 2013; Neece, 2014) indicate that more than the intervention itself is responsible and that factors yet accounted may be important for understanding the processes that occur during the MBSR intervention. The goal of this study is to investigate the role of therapeutic processes within a Mindfulness-Based Stress Reduction intervention to determine if group processes are responsible for any significant therapeutic change. Specifically, we are investigating whether positive bonding relationship, positive working relationship, and/or negative relationship predict changes in (1) parent mindfulness, (2) parent stress, and (3) child behavior problems post-treatment, after controlling for baseline levels of the outcome variables. Outcome variables selected based on previous research suggesting therapeutic change due to MBSR treatment intervention (Neece, 2014; Singh et al., 2007). We predict that the selected therapeutic processes will significantly predict these outcome measures such that, as participant ratings of the selected therapeutic process variables increase across levels (i.e. member-to-member, member-to-leader, member-to-

group), (1) parent mindfulness will increase, (2) parent stress will decrease, and (3) child behavior problems will decrease.

CHAPTER 2

METHODS

Participants

The current study included a subsample of 100 parents who participated in two phases of the Mindful Awareness for Parenting Stress (MAPS) project at Loma Linda University, which provided MBSR for parents of children with DD, ages 2.5 to 5. These parents were primarily recruited through the San Bernardino Inland Regional Center, which provides services for all individuals with developmental disabilities in the county. The majority (84%) of the sample are mothers and are married (77%). Parents and children are primarily Hispanic (48%), and are divers in terms of family income, with 35% reporting an annual family income below the poverty line. Additionally, only 37% of participating parents are college graduates and their mean age was 37 at the time of intake assessment. See Table 1 and Table 2 for additional participant demographics.

Table 1. Child Participant Demographics.

	N	%
Participating Children	77	100
Gender		
Male	54	70.1
Female	23	29.9
Ethnicity		
Hispanic	36	46.8
Caucasian	19	24.7
Other	17	22.1
Asian	3	3.9
African American	2	2.6
Age		
Two	11	14.3
Three	21	27.3
Four	27	35.0
Five	16	20.8
Six	2	2.6

Table 2. Participating Parent Demographics.

	N	%
Participating Parents	100	100
Gender		
Male	16	16.0
Female	84	84.0
Ethnicity		
Hispanic	47	47.0
Caucasian	34	34.0
Other	10	10.0
Asian	6	6.0
African American	3	3.0
Marital Status		
Married	77	77.0
Separated/Divorced	10	10.0
Never Married	13	13.0
Annual Family Income		
< $15k	8	8.0
$15k - $25k	12	12.0
$25k - $35k	15	15.0
$35k - $50k	17	17.0
$50k - $70k	11	11.0
$70k - $95k	19	19.0
> $95k	18	18.0
Primary School/No Education	3	3.0
High School	38	38.0
Associates/Vocational Degree	22	22.0
College	23	23.0
Graduate School	14	14.0
Age		
18 - 24	5	5.0
25 - 34	36	36.0
35 - 44	45	45.0
45 - 54	10	10.0
55 - 64	1	1.0

Families with children that met MAPS project study criteria were identified by the San Bernardino Inland Regional Center and given information regarding the study. Interested parents contacted the MAPS project and were phone screened for eligibility. Inclusion criteria were (1) that the family had a child within the ages of 2.5 to 5 years, (2) that the child had been determined by independent assessment, or by the San Bernardino Inland Regional Center, to have a DD, and (3) that the child was reported by the parent to have more than ten child behavior problems on the Eyberg Child Behavior Inventory (ECBI, Robinson, Eyberg, & Ross, 1980), (4) that the parents were not receiving any psychological or behavioral treatment at the time of referral, and (5) that the participating parent agreed to participate in the intervention. Exclusion criteria were that the child (1) had a debilitating physical disability, or (2) a severe intellectual impairment, which would prevent the child from participating in the parent-child interactions that were part of the larger assessment protocol (Neece, 2014). To be included in this study, sample participants needed to have complete data on the measures described below.

Procedure

Eligible parents were scheduled for a baseline assessment where participants completed an informed consent and demographic interview, then were randomly assigned to either an immediate or waitlist-control intervention group. Parents assigned to the immediate treatment group began the MBSR intervention shortly following their baseline assessment and those in the waitlist-control group began three months after the immediate treatment group. The MBSR intervention consisted of (1) didactic material on mindfulness and stress, (2) mindfulness exercises, and (3) whole group and paired

discussions, delivered during eight two-hour weekly sessions, one six-hour retreat, and daily pre-recorded audio instruction (Kabat-Zinn, 1990). Participants were taught several formal mindfulness practices, including the body scan, sitting meditation, awareness of breath, mindful movement, and yoga. Professional Spanish translation was provided via headsets, as well as Spanish intervention materials, for monolingual Spanish-speaking parents.

For the first phase of the MAPS project, parents assigned to the treatment group began their intervention in March 2012, while parents in the waitlist-control group began their intervention in June 2012. For the second phase, parents assigned to the treatment group began their intervention in the summer of 2014, while parents in the waitlist-control group began their intervention in the fall of 2014. Parents in both groups were contacted by email and phone to complete a retrospective online questionnaire about their MBSR experience. The survey was translated from English to Spanish and then back-translated to English by a Native Spanish speaker to confirm survey fidelity across languages.

Measures

Demographics

Demographic variables were collected during the initial assessment for both phases, prior to the onset of the intervention. Relevant child variables collected included age, gender, race, and developmental profile. Relevant parent variables included age, gender, race, marital status, annual income, and education level. See Table 1 and Table 2

for child and parent demographics, respectively. See Table 3 for baseline levels of study variables.

Table 3. Baseline Levels of Study Outcome Variables

Predictor Variable	*N*	*M*	*SD*	Clinical
Five Facets of Mindfulness				
Observing	63	24.35	5.18	-
Describing	63	26.73	6.14	-
Acting with Awareness	63	23.75	6.57	-
Nonjudgment	63	24.73	7.01	-
Nonreactivity	62	19.16	4.38	-
Parent Stress Index				
Parental Distress	52	36.98	8.39	75%[a]
Child Behavior Checklist				
Internalizing	58	19.48	7.94	57%[b]
Externalizing	58	22.71	8.08	41%[b]
Total	58	68.53	22.37	67%[b]

Note. *a* = at or above the clinical cutoff (85th percentile); *b* = at or above the clinical cutoff (*t*-score = 64).

Therapeutic Processes

The Group Questionnaire (GQ) was used to assess the different therapeutic processes occurring within the group. It consisted of 30 items scored on a seven-point Likert scale ranging from "Not at all True" (1) to "Very True" (7), and contained three subscales: Positive Bonding Relationship, Positive Working Relationship, and Negative Relationship. Positive bonding relationship referred to a sense of belonging or attraction in the relationship that created a positive atmosphere where the individual felt genuinely understood and appreciated; positive working relationship referred to the effectiveness of

the relationship to achieve agreed upon goals and to conduct cooperative work; negative relationship referred to a lack of trust, genuineness, and understanding, as well as any friction and distance that existed in the relationship. The GQ measured the therapeutic effects of relationships at three different levels: member-to-member, member-to-leader, and member-to-group. Chronbach alpha of the three subscales are .92, .90, and .80, respectively (Krogel, 2009).

Mindfulness

The Five Facets of Mindfulness Questionnaire (FFMQ) was used to assess participant mindfulness (Baer et al., 2006). It consisted of 39 items, rated on a five-point Likert scale ranging from "Never or Very Rarely True" (1) to "Very Often or Always True" (5), and assessed one's general mindfulness during day-to-day living. It comprised five subscales: observing, describing, acting with awareness, non-reactivity, and non-judging. The observing facet measured the tendency to notice internal and external experiences, sensations, emotions, and cognitions; the describing facet measured the tendency to describe and label these experiences with words; the acting with awareness facet referred to bringing a full, undivided attention to the current activity or experience; the non-judging facet referred to a non-evaluative stance towards inner experiences; and the non-reactivity facet measured the tendency to allow thoughts and feelings to come and go, without getting attached to them, or caught up in them. Alpha coefficients for all facets in all samples were adequate-to-good (range .72 to .92), with the exception of the non-reactivity facet in one student sample, for which alpha was .67. Other samples of the non-reactivity facet were good, ranging from .81 to .86.

Parent Stress

The Parenting Stress Index–Short Form (PSI-SF) was used to assess parenting stress (Abidin, 1995). The PSI-SF contained 36 items that were rated on a 5-point Likert scale ranging from 'Strongly Agree' (1) to 'Strongly Disagree' (5) and contained three subscales, Parental Distress, Parent-Child Dysfunctional Interaction and Difficult Child, which were combined into a Total Stress score (Abidin, 1995). The PSI-SF also included a validity index that measured the extent to which the parent was answering in a way that he/she thought would make them look best. A score of 10 or less on this index suggested that the parent was responding in a defensive manner and indicated that caution should be used in interpreting that parent's responses. Three participants had a defensive responding score below the validity cut-off and their responses were removed from the analyses.

For the current study, we used the Parental Distress subscale, which measured the extent to which the parent was experiencing stress in his or her role as a parent. This subscale was chosen because it assessed parental stress independent of child behavior issues, which were also a key outcome variable of the current investigation. Reliability for the Parental Distress subscale with our sample was $\alpha = .83$. Parents completed the PSI-SF prior to attending the intake assessment and again in the second assessment. (Neece, 2014)

Child Behaviors

The Child behavior checklist (CBCL) 1.5–5 was used to assess child behavior problems (Achenbach 2000). The CBCL contained 99 items that were rated as 'not true'

(0), ‘somewhat or sometimes true’ (1) or ‘very true or often true’ (2). Each item represented a problem behavior, such as ‘acts too young for age’ and ‘cries a lot’. The CBCL yielded a total problem score, 2 broadband scores (i.e. externalizing and internalizing), 7 narrowband scales and 6 DSM-oriented scales. In the current study, only the total problem score, the broadband externalizing problems score, and the broadband internalizing problems score were used. In the current sample, the mean reliability for the total problem score was a = 0.93. The CBCL also shows strong convergent validity with both diagnoses based on DSM-IV-TR diagnostic criteria and similar scales measuring child behavior problems (Achenbach 2000).

Statistical Analysis

Prior to running our analysis, data was screened for outliers and the assumptions of regression were tested. Three outcome variables (i.e. child externalizing problems, the describing facet of mindfulness, and parental distress) violated the assumption of constant variance of residuals. Transformations were performed to correct violations yet were unsuccessful. Results for these analyses should be interpreted with caution. Three participants were removed due to failing to meet the validity index for defensive responding on the Parental Stress Index. Outliers that were further than three standard deviations from the mean were replaced with a value precisely three standard deviations from the mean. Specifically, one outlier was identified greater than three standard deviations below the mean for total positive bond, one outlier was identified greater than three standard deviations above the mean for total negative relationship, one outlier was identified greater than three standard deviations above the mean for pre-treatment

internalizing child behavior problems, one outlier was identified greater than three standard deviations above the mean for post-treatment internalizing child behavior problems, and one outlier was identified greater than three standard deviations above the mean for pre-treatment mindful nonreactivity. In total, 5 outliers were identified and replaced to being within three standard deviations amongst all study participants within the analyzed variables. A series of hierarchical linear regression analyses were conducted to test the predictive ability of the selected therapeutic processes to predict changes in mindfulness, parent stress, and child behavior. In each regression analysis, initial levels of the outcome variable were entered into the regression equation first, to control for baseline participant variability. Next, post intervention levels of the outcome variable were regressed onto the therapeutic process variables to test its predictive ability in each case.

CHAPTER 3

RESULTS

A hierarchical multiple regression analysis was used to determine the influence of positive bonding relationship, positive working relationship, and negative relationship on parent mindfulness, parent stress, and child behavior problems, after controlling for baseline outcome variables, among parents of children with DD.

Overall, the regression model for the observing facet of mindfulness accounted for a significant proportion of the variance in post-treatment mindful observing, such that the optimal linear combination of baseline mindful observing, total positive bonding relationship, total positive working relationship, and total negative relationship accounted for 20.3% of the variance in post-treatment mindful observing, R^2 *adj* = .203, F (4, 40) = 3.808, $p < .05$. Baseline mindful observing was a marginally significant predictor of post-treatment mindful observing, such that as baseline mindful observing increases by one-unit, post-treatment mindful observing increases by .361 units (*b* = .361, 95% CI [-0.006, 0.727], $p < .10$). Total positive bonding relationship, total positive working relationship, and total negative relationship were not significant independent predictors of post-treatment mindful observing ($p > .05$). See Table 4 for regression statistics.

Table 4. Results of a Multiple Regression Analysis Predicting Parent Mindful Observing from Baseline Observing, Positive Bonding Relationship, Positive Working Relationship, and Negative Relationship

Predictor Variable	*b*	95% CI	*t*	sr^2	pr^2
Mindfulness - Observing					
Step 1					
Baseline Observing	0.358	[-0.008, 0.725]	**1.940†**	0.102	0.102
Step 2					
Baseline Observing	0.361	[-0.006, 0.727]	**1.951†**	0.102	0.107
Positive Bonding	0.017	[-0.225, 0.259]	0.141	0.001	0.001
Positive Working	0.064	[-0.142, 0.270]	0.611	0.007	0.009
Negative Relationship	-0.044	[-0.324, 0.237]	-0.307	-0.002	-0.002

Note. † indicates significance at $p < .10$

The regression model for the describing facet of mindfulness accounted for a significant proportion of the variance in post-treatment mindful describing, such that the optimal linear combination of baseline mindful describing, total positive bonding relationship, total positive working relationship, and total negative relationship accounted for 47.5% of the variance in post-treatment mindful describing, R^2 *adj* = .475, F (4, 40) = 10.933, $p < .05$. Baseline mindful describing was a significant predictor of post-treatment mindful describing, such that as baseline mindful describing increases by one-unit, post-treatment mindful describing increases by .678 units (*b* = .678, 95% CI [0.369, 0.987], $p < .05$). Total positive bonding relationship, total positive working relationship, and total negative relationship were not significant independent predictors of post-treatment mindful observing ($p > .05$). See Table 5 for regression statistics.

Table 5. Results of a Multiple Regression Analysis Predicting Parent Mindful Describing from Baseline Describing, Positive Bonding Relationship, Positive Working Relationship, and Negative Relationship

Predictor Variable	*b*	95% CI	*t*	sr^2	pr^2
Mindfulness - Describing					
Step 1					
Baseline Describing	0.686	[0.372, 0.999]	**4.369***	0.398	0.398
Step 2					
Baseline Describing	0.678	[0.369, 0.987]	**4.379***	0.372	0.407
Positive Bonding	-0.001	[-0.211, 0.209]	-0.011	-0.000	-0.000
Positive Working	-0.017	[-0.208, 0.174]	-0.173	-0.000	-0.001
Negative Relationship	-0.172	[-0.400, 0.056]	-1.481	-0.024	-0.043

Note. * indicates significance at $p < .05$

The regression model for the acting with awareness facet of mindfulness accounted for a significant proportion of the variance in post-treatment mindful acting with awareness, such that the optimal linear combination of baseline mindful acting with awareness, total positive bonding relationship, total positive working relationship, and total negative relationship accounted for 24.9% of the variance in post-treatment mindful acting with awareness, R^2 *adj* = .249, F (4, 40) = 4.653, $p < .05$. Baseline mindful acting with awareness was a significant predictor of post-treatment mindful acting with awareness, such that as baseline mindful acting with awareness increases by one-unit, post-treatment mindful acting with awareness increases by .436 units (b = .436, 95% CI [0.096, 0.777], $p < .05$). Total positive bonding relationship, total positive working relationship, and total negative relationship were not significant independent predictors of post-treatment mindful acting with awareness ($p > .05$). See Table 6 for regression statistics.

Table 6. Results of a Multiple Regression Analysis Predicting Parent Mindful Acting with Awareness from Baseline Acting with Awareness, Positive Bonding Relationship, Positive Working Relationship, and Negative Relationship

Predictor Variable	*b*	95% CI	*t*	sr^2	pr^2
Mindfulness - Awareness					
Step 1					
Baseline Awareness	0.457	[0.118, 0.796]	**2.697***	0.210	0.210
Step 2					
Baseline Awareness	0.436	[0.096, 0.777]	**2.560***	0.199	0.185
Positive Bonding	-0.018	[-0.261, 0.224]	-0.149	-0.001	-0.000
Positive Working	0.062	[-0.134, 0.258]	0.620	0.008	0.006
Negative Relationship	-0.114	[-0.404, 0.177]	-0.773	-0.014	-0.010

Note. * indicates significance at $p < .05$

The regression model for the nonjudgment facet of mindfulness accounted for a significant proportion of the variance in post-treatment mindful nonjudgment, such that the optimal linear combination of baseline mindful nonjudgment, total positive bonding relationship, total positive working relationship, and total negative relationship accounted for 31.1% of the variance in post-treatment mindful nonjudgment, R^2 *adj* = .311, F (4, 40) = 5.975, $p < .05$. Baseline mindful nonjudgment was a significant predictor of post-treatment mindful nonjudgment, such that as baseline mindful nonjudgment increases by one-unit, post-treatment mindful nonjudgment increases by .443 units (b = .443, 95% CI [0.200, 0.686], $p < .05$). Total positive bonding relationship, total positive working relationship, and total negative relationship were not significant independent predictors of post-treatment mindful nonjudgment ($p > .05$). See Table 7 for regression statistics.

Table 7. Results of a Multiple Regression Analysis Predicting Parent Mindful Non-Judgement from Baseline Non-Judgement, Positive Bonding Relationship, Positive Working Relationship, and Negative Relationship

Predictor Variable	*b*	95% CI	*t*	sr^2	pr^2
Mindfulness – Non-Judgement					
Step 1					
Baseline Non-Judgement	0.453	[0.206, 0.700]	**3.638***	0.285	0.285
Step 2					
Baseline Non-Judgement	0.443	[0.200, 0.686]	**3.611***	0.265	0.282
Positive Bonding	0.022	[-0.194, 0.238]	0.202	0.001	0.001
Positive Working	0.016	[-0.161, 0.193]	0.176	0.000	0.001
Negative Relationship	-0.077	[-0.322, 0.168]	-0.618	-0.006	-0.009

Note. * indicates significance at $p < .05$

The regression model for the nonreactivity facet of mindfulness accounted for a significant proportion of the variance in post-treatment mindful nonreactivity, such that the optimal linear combination of baseline mindful nonreactivity, total positive bonding relationship, total positive working relationship, and total negative relationship accounted for 27.6% of the variance in post-treatment mindful nonreactivity, R^2 *adj* = .276, F (4, 40) = 5.201, $p < .05$. Baseline mindful nonreactivity was a significant predictor of post-treatment mindful nonreactivity, such that as baseline mindful nonreactivity increases by one-unit, post-treatment mindful nonreactivity increases by .491 units (b = .491, 95% CI [0.113, 0.869], $p < .05$). Total positive bonding relationship, total positive working relationship, and total negative relationship were not significant independent predictors of post-treatment mindful nonreactivity ($p > .05$). See Table 8 for regression statistics.

Table 8. Results of a Multiple Regression Analysis Predicting Parent Mindful Nonreactivity from Baseline Nonreactivity, Positive Bonding Relationship, Positive Working Relationship, and Negative Relationship

Predictor Variable	*b*	95% CI	*t*	sr^2	pr^2
Mindfulness – Nonreactivity					
Step 1					
Baseline Nonreactivity	0.519	[0.148, 0.890]	**2.778***	0.182	0.182
Step 2					
Baseline Nonreactivity	0.491	[0.113, 0.869]	**2.569***	0.149	0.160
Positive Bonding	-0.057	[-0.267, 0.154]	-0.535	-0.006	-0.008
Positive Working	0.024	[-0.151, 0.199]	0.271	0.001	0.002
Negative Relationship	-0.096	[-0.339, 0.146]	-0.783	-0.011	-0.015

Note. * indicates significance at $p < .05$

The regression model for parental distress accounted for a significant proportion of the variance in post-treatment parental distress, such that the optimal linear combination of baseline parental distress, total positive bonding relationship, total positive working relationship, and total negative relationship accounted for 26.5% of the variance in post-treatment parental distress, R^2 *adj* = .265, F (4, 41) = 5.049, $p < .05$. Baseline parental distress was a significant predictor of post-treatment parental distress, such that as baseline parental distress increases by one-unit, post-treatment parental distress increases by .290 units (b = .290, 95% CI [0.079, 0.502], $p < .05$). Total positive bonding relationship, total positive working relationship, and total negative relationship were not significant independent predictors of post-treatment parental distress ($p > .05$). See Table 9 for regression statistics.

Table 9. Results of a Multiple Regression Analysis Predicting Parental Distress from Baseline Parental Distress, Positive Bonding Relationship, Positive Working Relationship, and Negative Relationship

Predictor Variable	*b*	95% CI	*t*	sr^2	pr^2
Parental Distress					
Step 1					
Baseline Parental Distress	0.303	[0.084, 0.522]	**2.726***	0.154	0.154
Step 2					
Baseline Parental Distress	0.290	[0.079, 0.502]	**2.706***	0.135	0.151
Positive Bonding	-0.094	[-0.349, 0.160]	-0.731	-0.010	-0.013
Positive Working	-0.085	[-0.327, 0.157]	-0.694	-0.010	-0.012
Negative Relationship	0.017	[-0.261, 0.295]	0.118	0.000	0.000

Note. * indicates significance at $p < .05$

The regression model for total child behavior problems accounted for a significant proportion of the variance in post-treatment total child behavior problems, such that the optimal linear combination of baseline total child behavior problems, total positive bonding relationship, total positive working relationship, and total negative relationship accounted for 55.5% of the variance in post-treatment total child behavior problems, R^2 *adj* = .555, F (4, 46) = 16.576, $p < .05$. Baseline total child behavior problems was a significant predictor of post-treatment total child behavior problems, such that as baseline total child behavior problems increases by one-unit, post-treatment total child behavior problems increase by .711 units (b = .711, 95% CI [0.519, 0.903], $p < .05$). Total positive bonding relationship, total positive working relationship, and total negative relationship were not significant independent predictors of post-treatment total child behavior problems ($p > .05$). See Table 10 for regression statistics.

Table 10. Results of a Multiple Regression Analysis Predicting Total Child Behavior Problems from Baseline Total Child Behavior Problems, Positive Bonding Relationship, Positive Working Relationship, and Negative Relationship

Predictor Variable	*b*	95% CI	*t*	sr^2	pr^2
Total Child Behavior Problems					
Step 1					
Baseline Total Child Behavior Problems	0.709	[0.514, 0.903]	**7.154***	0.515	0.515
Step 2					
Baseline Total Child Behavior Problems	0.711	[0.519, 0.903]	**7.275***	0.510	0.533
Positive Bonding	0.503	[-0.098, 1.104]	1.647	0.027	0.056
Positive Working	-0.337	[-0.911, 0.236]	-1.158	-0.014	-0.029
Negative Relationship	0.552	[-0.172, 1.275]	1.498	0.020	0.044

Note. * indicates significance at $p < .05$

The regression model for internalizing child behavior problems accounted for a significant proportion of the variance in post-treatment internalizing child behavior problems, such that the optimal linear combination of baseline internalizing child behavior problems, total positive bonding relationship, total positive working relationship, and total negative relationship accounted for 50.8% of the variance in post-treatment internalizing child behavior problems, $R^2 adj = .508$, F (4, 46) = 13.921, $p < .05$. Baseline internalizing child behavior problems was a significant predictor of post-treatment internalizing child behavior problems, such that as baseline internalizing child behavior problems increases by one-unit, post-treatment internalizing child behavior problems increases by .764 units ($b = .764$, 95% CI [0.538, 0.990], $p < .05$). Total positive bonding relationship, total positive working relationship, and total negative relationship were not significant independent predictors of post-treatment internalizing child behavior problems ($p > .05$). See Table 11 for regression statistics.

Table 11. Results of a Multiple Regression Analysis Predicting Internalizing Child Behavior Problems from Baseline Internalizing Child Behavior Problems, Positive Bonding Relationship, Positive Working Relationship, and Negative Relationship

Predictor Variable	*b*	95% CI	*t*	sr^2	pr^2
Internalizing Child Behavior Problems					
Step 1					
Baseline Internalizing Child Behavior Problems	0.769	[0.543, 0.996]	**6.685***	0.484	0.484
Step 2					
Baseline Internalizing Child Behavior Problems	0.764	[0.538, 0.990]	**6.651***	0.470	0.493
Positive Bonding	0.171	[-0.089, 0.432]	1.299	0.020	0.039
Positive Working	-0.111	[-0.353, 0.131]	-0.901	-0.010	-0.019
Negative Relationship	0.190	[-0.110, 0.490]	1.245	0.015	0.031

Note. * indicates significance at $p < .05$

The regression model for externalizing child behavior problems accounted for a significant proportion of the variance in post-treatment externalizing child behavior problems, such that the optimal linear combination of baseline externalizing child behavior problems, total positive bonding relationship, total positive working relationship, and total negative relationship accounted for 47.2% of the variance in post-treatment externalizing child behavior problems, $R^2 adj = .472$, F (4, 46) = 12.196, $p < .05$. Baseline externalizing child behavior problems was a significant predictor of post-treatment externalizing child behavior problems, such that as baseline externalizing child behavior problems increases by one-unit, post-treatment externalizing child behavior problems increases by .596 units ($b = .596$, 95% CI [0.383, 0.809], $p < .05$). Total positive bonding relationship, total positive working relationship, and total negative relationship were not significant independent predictors of post-treatment externalizing child behavior problems ($p > .05$). See Table 12 for regression statistics.

Table 12. Results of a Multiple Regression Analysis Predicting Externalizing Child Behavior Problems from Baseline Externalizing Child Behavior Problems, Positive Bonding Relationship, Positive Working Relationship, and Negative Relationship

Predictor Variable	*b*	95% CI	*t*	sr^2	pr^2
Externalizing Child Behavior Problems					
Step 1					
Baseline Externalizing Child Behavior Problems	0.769	[0.543, 0.996]	**6.685***	0.484	0.484
Step 2					
Baseline Externalizing Child Behavior Problems	0.764	[0.538, 0.990]	**6.651***	0.470	0.493
Positive Bonding	0.171	[-0.089, 0.432]	1.299	0.020	0.039
Positive Working	-0.111	[-0.353, 0.131]	-0.901	-0.010	-0.019
Negative Relationship	0.190	[-0.110, 0.490]	1.245	0.015	0.031

Note. * indicates significance at $p < .05$

CHAPTER 4

DISCUSSION

The goal of this study was to investigate the role of therapeutic group processes within a Mindfulness-Based Stress Reduction intervention for parents of children with DD in order to determine the role of therapeutic process factors in predicting participant outcomes. Specifically, we investigated three composite therapeutic process factors that were comprised of items from both individual and group therapeutic process measures that had well-established predictive ability (Burns & Auerbach, 1996, Horvath & Greenburg, 1989, Lese & McNair-Semands, 2000, & MacKenzie, 1983) to determine outcomes within a variety of therapeutic contexts (Brown & O'Leary, 2001; Hurley & Rosenberg, 1990; Ogrodniczuk & Piper, 2003; Yalom & Lescsz, 2005). To the author's knowledge, only two other studies have investigated the role of therapeutic processes within the context of any type of mindfulness-based intervention (Bowen & Kurz, 2012; Goldberg, Davis, & Hoyt, 2013), and the current study is the first to investigate therapeutic processes within the standardized MBSR treatment intervention. Results of this study failed to indicate any of the relational therapeutic processes as significant contributors to therapeutic outcomes across the chosen study variables. Overall, further investigation is required to determine the significance and level of impact of therapeutic processes within the MBSR context for parents of children with DD.

One possible explanation for these results may be due to the unique nature of the MBSR intervention. While there are both dyadic and group discussions that occur as part of the MBSR treatment protocol, the majority of the eight-week MBSR intervention is individually-focused and practiced. Furthermore, the MBSR instructor training process

similarly emphasizes on the instructor's cultivation of their own personal mindfulness practice, as well as rigorously delivering the MBSR curriculum, rather than relational or interpersonal skills (Center for Mindfulness, 2017). In one of the few studies investigating therapeutic processes as a predictor of outcomes in a mindfulness-based intervention, Goldberg, Davis, and Hoyt (2013) stated, "given the introspective nature of mindfulness practice, it is theoretically plausible that alliance with one's mindfulness instructor is simply less important than in other forms of therapy." While the author's in this study found that the therapeutic alliance was predictive of several outcome variables, it is important to recognize that the standardized MBSR intervention does not include many of the process-oriented elements of a traditional psychotherapy group interaction. The MBSR intervention is primarily a didactic treatment protocol with in-class practice exercises and discussion. Individual home practice is also a major component of the MBSR treatment protocol and is not associated with the group. In fact, studies show that home practice may be responsible for MBSR treatment outcomes (Carmody & Baer, 2008, Shapiro, Bootzin, Figueredo, Lopez, & Schwartz, 2003), indicating that group processes and group support may not be as relevant in this context as simple skill practice. While participants are assigned a partner communicate with each week during the beginning of treatment, this activity occurs outside the group context, is not referred to, reviewed, or integrated into the weekly MBSR group sessions, and may not be considered part of the group process by participants.

Another important consideration regarding our results is the possibility of other relevant therapeutic processes that were not assessed in the current study. While relational therapeutic processes such as the therapeutic alliance and group cohesion may

not be significant within the MBSR context, several of the group therapeutic factors such as the instillation of hope, universality, imparting information, altruism, imitative behavior, and interpersonal learning (Yalom & Leszcz, 2005) may all play significant parts that are not being measured here. Many participants in the MAPS study entered the MBSR intervention with clinical levels of parenting stress. As group members around them began to report improvements in their stress, the instillation of hope may have provided a means for participants to begin to engage in the MBSR treatment practices and the group process as a whole. Similarly, the therapeutic factor of universality may have allowed parents to recognize that they are not alone in their struggle of raising a child with DD. This alone has the capacity alter one's perspective, increase motivation, or shift one's level of engagement such that it affects their treatment. The therapeutic process of imparting information and altruism may also play a significant role in MBSR. When parents relate about what has worked for them in an effort to help one another, it may be a type of didactic learning that is responsible for a proportion of these parents' improvement, though neither the relational therapeutic processes nor the MBSR treatment itself encapsulate it. Similarly, parents may implicitly learn from one another, either imitatively or interpersonally. Parents may see the behaviors, practices, or skills of others in the group and decide imitated them, leading to treatment outcome improvements not yet accounted for, or have new experiences with other members in the group that lead to diffuse therapeutic improvements.

Several statistical limitations should also be considered when reviewing these study results. Foremost amongst these is the retrospective nature of the therapeutic process measures. For participants in the first phase of the MAPS study, measures of the

therapeutic process variables were obtained five years after the completion of the MBSR intervention, which may have confounded their retrospective self-report. Certain memory biases which effect episodic memory, such as the primacy effect and recency effect (Murdock, 1962), may have affected how the participants remember their experience over time. Additionally, stress has been shown to bias learning in favor of negative stimuli and negatively impact our working memory (Luethi, Meier, & Sandi, 2009), which may have differentially affected participants' ability store and recall memories about their experience. While research exists to support the idea that retrospective reporting does not invalidate historical data (Seligman, 1995), it's difficult to know for certain how accurate these reports are when it is well-established that memory storage involves important time-dependent processes (McGaugh, 1966).

Another statistical consideration is our level of power. Traditional therapeutic process variables such as the therapeutic alliance and group cohesion generally have shown medium effect sizes but, a study by Imel, Baldwin, Bonus, & MacCoon (2008) found that group membership – that is, participating in one group versus another - only uniquely accounted for 7% of the improvements in general psychological distress after an MBSR intervention. These findings indicate that therapeutic processes may have smaller effect sizes within the MBSR context, leading to increased demands for statistical power. In our study, our achieved power across analyses ranged from 5% (the proportion of variance in parental distress that negative relationship explained) to 43% (the proportion of variance in total child behavior problems that positive bonding explained), well below the necessary level to reliably detect a true significant effect. Furthermore, the unique proportions of variance explained by the identified therapeutic processes for the selected

study outcome variables ranged between less than 0.1% (the proportion of variance in mindful describing that both positive bonding relationship and positive working relationship explained, as well as the proportion of variance in mindful non-judgement that positive working relationship explained) to 2.8% (the proportion of variance in externalizing child behavior problems that positive bonding relationship explained), highlighting the probability of insufficient power given the small effect sizes observed in our analyses. Additionally, exploratory post-hoc analyses conducted looking at each level (i.e. member-to-member, member-to-leader, member-to-group) of positive bonding relationship, positive working relationship, and negative relationship for the identified study outcome variables revealed no significant effects. While we did conduct multiple imputations to account for power concerns associated with missing data (Stearn et al., 2009), it may not have been enough considering our achieved power and effect sizes.

It may be possible that the relationship between therapeutic processes and treatment outcomes may be mediated by other variables. In their paper on the role of the therapeutic alliance in a mindfulness-based smoking cessation intervention, Goldberg, Davis, & Hoyt (2013) found that the therapeutic alliance predicted several treatment outcomes, including treatment compliance, it did not predict the primary smoking outcomes. It may be possible that therapeutic process variables are not directly predictive of treatment outcomes but, indirectly through the effects of treatment adherence, attendance, or participation. Treatment adherence has been demonstrated to be predictive of outcomes in mindfulness-based interventions (Carmody & Baer, 2008; Shapiro, Bootzin, Figueredo, Lopez, & Schwartz, 2003; Speca, Carlson, Goodey, & Angen, 2000) and mindfulness training has been shown to be predictive of improvements in parenting

stress (Bazzano et al., 2013; Dykens et al., 2014; Minor et al., 2006; Neece, 2014) and child behaviors (Neece, 2014; Singh et al., 2007; Singh et al., 2014, Singh et al., 2010). It may be possible that relational therapeutic processes between the participant and the instructor or other members of the group may result in greater treatment compliance, leading to improvements in participant outcomes.

Lastly, several factors may moderate the impact of therapeutic processes, making them more or less important for certain types of parents. For example, while the vast majority of our sample were mothers, a study by Greenfield and colleagues (2013) suggests that a mixed-gender therapy group may create barriers to group cohesion, empathy, intimacy, and safety for women. While research indicates that females may gravitate more towards and benefit more from mindfulness-based interventions (Katz & Toner, 2013), these effects do no hold up in all settings (Klatt, Buckworth, & Marlarkey, 2009) and highlight the potential role of group gender composition for moderating outcomes. Additionally, males and females have been shown to interact differently with same-gender versus opposite-gender group members and have been shown to interact differently with their spouses than with other group members (McCarrick, Manderscheid, & Silbergeld, 1981), indicating that group attendance with one's spouse may also potentially moderate how the group is experienced. Future studies are encouraged to investigate the role of same-gender versus opposite-gender interactions within the group, as well as role of spouse attendance on outcomes as a review of the literature revealed no studies investigating these potential moderators.

Another factor may be group diversity, as our group was quite ethnically diverse. Research indicates that group cohesion improves as a function of interactional exposure

in diverse groups (Harrison, Price, & Bell, 1998), and it may be possible that surface-level diversity prohibited relevant therapeutic processes such as group cohesion that may have needed more time to develop.

To address these limitations, there are several steps we intend to take. Firstly, in our latest randomized clinical trial we have begun to collect concurrent measures of relational therapeutic process variables in order remedy the retrospective data limitation in the current study. Additionally, we are collecting these concurrent measures during three separate phases of an MBSR intervention and will have a significantly larger sample size in order to address our current concern regarding statistical power. Additionally, we will investigate methods for better identifying and accounting for moderating factors of the impact of group therapeutic and explore the mediating role of treatment compliance on participant outcomes.

While mindfulness-based interventions have been consistently shown to have salutary effects, the mechanisms by which it produces change is still unclear. Several of Yalom's therapeutic factors (i.e. instillation of hope, universality, imparting information, altruism, imitative behavior, and interpersonal learning) should be explored in future studies, as they may be relevant either in place of, or in addition to, the relational therapeutic processes explored in the current study. It will be important to investigate all potential therapeutic processes within the MBSR context if we are to understand how mindfulness produces therapeutic change and effective MBSR group leadership training. Future studies should also investigate the therapeutic effect of the MBSR group versus individual practice, as a review of the literature revealed few studies related to the effect of group practice compared to individual practice within a mindfulness-based

intervention, with inconclusive results (Mantzios, & Giannou, 2014; Schroevers, Tovote, Snippe, & Fleer, 2016), and no studies comparing the effect of group practice to the effect of the MBSR instructor in regards to outcomes. While MBSR and Mindfulness-based interventions work to improve participants stress and well-being, the current study show's no indication that relational therapeutic processes are responsible for this improvement. That said, the current study highlights the importance of future investigation into the mechanisms of mindfulness in order to explain the benefits consistently obtained by mindfulness participants and practitioners, as these and future data may have important implications on MBSR teacher training protocols as well as group monitoring for optimizing participant outcomes.

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