



Effects of a brief mindfulness-infused behavioral parent training for mothers of children with autism spectrum disorder



Tracy J. Raulston^{a,*}, Patricia K. Zemantic^b, Wendy Machalicek^b, Meme Hieneman^c,
Eva Kurtz-Nelson^b, Hannah Barton^b, Sarah G. Hansen^d, Rebecca J. Frantz^e

^a The Pennsylvania State University, 125 Cedar Building, University Park, PA, 16802, USA

^b University of Oregon, 142 Lokey Education Building 1235, Eugene, OR, 94403, USA

^c Positive Behavior Support Applications, 3558 Shoreline Circle, Palm Harbor, FL, 34684, USA

^d Georgia State University, 30 Pryor Street, SW Atlanta, GA, 30306, USA

^e University of Illinois at Urbana-Champaign, 1310 S. Sixth Street, Champaign, IL, 61820, USA

ARTICLE INFO

Keywords:

Autism
Behavioral parent training
Mindfulness

ABSTRACT

A concurrent randomized multiple baseline across three mother-child dyads single-case design was employed to evaluate the effects of a brief mindfulness-infused behavioral parent training program. The program included strategies embedded within the context of natural family routines. Three mothers and their children with autism spectrum disorder participated. At the individual tier level, visual analysis revealed moderately positive results for two mother-child dyads and contraindicated results for maternal self-reported stress in one dyad. At the study level, standardized mean difference analyses yielded a medium effect for increases in behavioral strategy use and small-moderate effects for decreases in parent stress and child challenging behavior. Implications for continued research and applications of the program for families of children with ASD are discussed.

Children with autism spectrum disorder (ASD) experience deficits in social-communication and repetitive patterns of behavior and interests (American Psychiatric Association, 2013). This population is at a greater risk for co-occurring challenging behaviors, including aggression, non-compliance, self-injury, stereotypy, and elopement (Baghdadli, Pascal, Grisli, & Aussiloux, 2003; Kanne & Mazurek, 2011). Challenging behaviors are associated with negative child outcomes (e.g., poor health, academic, social-emotional functioning) (Kuhlthau et al., 2011). These negative outcomes extend beyond the child to parents, who are at an increased risk of deleterious psychological outcomes, including increased levels of stress and depressive symptoms (Totsika, Hastings, Emerson, Berridge, & Lancaster, 2011). Challenging behavior and lack of prosocial behaviors (e.g., accepting redirection, following rules) have been found to strongly predict parental stress and can exacerbate stress over time (Lecavalier, Leone, & Wiltz, 2006).

Parents of children with ASD report higher stress levels than parents of children with other developmental disabilities (Dabrowska & Pisula, 2010). The relationship between parental stress and child challenging behavior appears to be bidirectional, thus having mutually escalating or deescalating effects over time (Herring et al., 2006; Lecavalier et al., 2006; Neece, Green, & Baker, 2012). Caregiver stress can interfere with the effectiveness of treatments for children with ASD (Osborne,

McHugh, Saunders, & Reed, 2008) and has been shown to be positively associated with maladaptive parenting practices (Abidin, 1992; Deater-Deckard & Scarr, 1996) and negatively associated with aspects of well-being (e.g., physical health, relationship and marital satisfaction; Cantwell, Muldoon, & Gallagher, 2014; Hartley, Papp, & Bolt, 2016; Weitlauf, Vehorn, Taylor, & Warren, 2014).

1. Interventions for challenging behavior

Practices based in applied behavior analysis (ABA) hold the strongest evidence base for treating challenging behavior in children with ASD (National Autism Center, 2015). The Division for Early Childhood recommends that practices for children with developmental disabilities be family-centered and capacity building (2014). Specifically, practices should strengthen families' knowledge and enhance parenting skills within natural routines. Training techniques have included didactic methods to teach parents about behavioral principles and procedures as well as how to implement function-based behavioral strategies in home settings (Ruppert, Machalicek, Hansen, Raulston, & Frantz, 2016).

Families of children with ASD may face several barriers to accessing services and training. Following a diagnosis, a child is likely to be placed on a waitlist to receive behavioral health services due to a

* Corresponding author. Pennsylvania State University, 125 Cedar Building, University Park, PA, 1680, USA
E-mail address: tjr61@psu.edu (T.J. Raulston).

shortage of behavior analysts (Machalicek et al., 2016). Further, these costly services are often delivered in clinics or outside of the context of the family ecology (Lindgren, Wacker, & Sues, 2016). Parenting stress is usually treated separately from the child's challenging behavior (Frantz, Hansen, & Machalicek, 2018). Given the bidirectional relationship between parenting stress and child behavior, it is necessary to evaluate brief parent training programs that may prevent challenging behavior or parenting stress from worsening while families wait for more intensive services.

Within a family-based positive behavior support (PBS) framework, interventions are designed to have ecological validity, include parent-child interactions, and involve family-professional collaborative partnerships (Dunlap, Newton, Fox, Benito, & Vaughn, 2001; Lucyshyn et al., 2015). Best practices include engaging parents in functional behavioral assessments and training them to implement plans that include antecedent strategies, replacement behavior(s), and consequence-based strategies within naturally occurring routines, while reflecting family goals and improving quality of life (Fettig & Barton, 2014). Intervening on challenging behavior alone is not enough for some families, as intervention implementation may increase caregiver burden and exacerbate stress (Strauss et al., 2012), and some parents continue to experience high levels of distress even when their child responds positively to ABA treatments (Grindle, Kovshoff, Hastings, & Remington, 2009; Remington et al., 2007). Therefore, it is imperative to consider approaches that may protect against parenting stress within this population.

2. Mindful parenting

Mindfulness interventions are gaining popularity (Brown, Creswell, & Ryan, 2015). Mindfulness can be defined as an open and accepting attitude cultivated by applying a purposeful, non-judgmental moment-to-moment awareness (Kabat-Zinn, 1990). This construct extends to the parent-child relationship in the context of mindful parenting, which allows parents to cultivate a focused awareness to attend to their children's needs and respond purposefully instead of reacting or reverting to automatic parenting practices (Duncan, Coatsworth, & Greenberg, 2009; Kabat-Zinn & Kabat-Zinn, 1997).

An emerging body of research on mindfulness-based interventions for parents of children with developmental disabilities has shown positive effects on parent stress, depression, and life satisfaction, as well as spillover effects on child attention problems (Neece, 2014). Singh et al. (2006) employed a single-case multiple baseline design to evaluate the effects of an intensive 12-week mindfulness parent training. Mothers were instructed to use any behavior management strategies already in place. Findings suggested small-moderate decreases in noncompliance, aggression, and self-injury in the children. In a follow-up study, Singh et al. (2007) extended these findings and trained four mothers of children with developmental disabilities. Visual analysis indicated decreases in aggressive behavior for all dyads, with those effects continuing in the final 52-week mindfulness practice phase. Mothers' self-reported stress also decreased.

Interventions that focus on training caregivers to implement both PBS and mindfulness, notably Mindfulness Based PBS (e.g., Singh et al., 2014), are emerging. Singh et al. (2014) employed a single-case multiple baseline across three mother-adolescent dyads in which mothers were trained for eight weeks. Decreases in aggression and increases in compliance occurred for the adolescents across all three tiers, and mothers' self-reported stress decreased. Mothers reported that previous behavioral programming had increased their stress because (a) they viewed the behavior support plans as being too technical, procedural, and labor intensive and (b) they found that applying strict

contingencies resulted in negative interactions with their child and damaged their relationship.

3. The current study

Previous research has examined the effects of lengthy mindfulness training (i.e., 8–12 weeks in duration). Due to the barriers families often experience, it is necessary to evaluate brief parent training programs that teach parents to manage stress as well as their child's challenging behavior. The Practiced Routines program is a product recently developed in clinical trial by IRIS Educational Media (National Institutes of Health United States Library of Medicine, 2018). This clinical trial evaluated two programs using a mixed-model repeated measures, randomized group design. Results indicated that both groups showed significant improvements across different self-reported family, parent, and child outcomes. No direct behavioral observation data were collected, nor was the study powered for moderator analyses. To examine variables affecting differential responding, the current investigation evaluated the effects of this program on direct behavioral observations of behavioral strategy use, child challenging behavior, as well as repeated measures of mother's self-reported distress.

4. Method

Following approval from a University Institutional Review Board, parent-child dyads were recruited from a mid-sized city in the Northwest region of the United States. Fathers were eligible to participate; however, no fathers responded to invitations. Eligible parents indicated that (a) their child engaged in challenging behavior that disrupted at least one family routine, (b) their child's challenging behavior contributed to their parenting stress, and (c) they would be willing to participate in mindfulness meditation. Children had a documented special educational eligibility of ASD. The first author completed an interview with each mother using (a) the Childhood Autism Rating Scale – 2nd Edition (CARS-2; Schopler, Van Bourgondien, Wellman, & Love, 2010); (b) the externalizing subscale from the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2000, /2001); (c) the Parenting Stress Index-3rd Edition – Short Form (PSI-SF; Abidin, 2012); and (d) the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977).

Four mother-child dyads continued to the next phase, which included administration of the Bangor Mindful Parenting Scale (BMPS; Jones, Hastings, Totsika, Keane, & Rhule, 2014), a partial Functional Assessment Interview – Young Child (FAI-YC, O'Neill et al., 1997), the Questions About Behavior Function (QABF; Matson & Vollmer, 1995), and a modified version of the Routines Based Interview (McWilliam, 2009). The first author used these tools in consultation with the mother to identify a routine that was problematic for the family due to the target child's challenging behavior and to develop operational definitions for each child's challenging behavior. Following this phase, one mother dropped out of the study citing physical health problems. Three biological mothers and their child with ASD participated in all experimental phases of the current study. Although mothers' pre-existing knowledge of behavior analytic strategies was not evaluated, families were not currently using a behavior support plan at home or receiving behavioral parent training prior to study. Additionally, no families had received formal ABA therapy.

4.1. Participants and setting

Angela and Jonathan. Angela was a Caucasian 34-year old female. She had completed some college, and her employment status was

disabled. She reported a history of mental health conditions (antisocial personality disorder, depression, social anxiety, and panic attacks). Her raw score on the PSI-SF was a 76, which was elevated, yet in the normal range. Her raw score on the CES-D was a 22, which was in the mid depressive range. She lived with her partner, who was the biological father of their two children (i.e., the target child and his brother who was a 2 year, 5-month-old boy with a communication delay). The target child, Jonathan, was a 4-year, 4-month-old male. Jonathan's score on the CBCL Aggressive Behavior subscale was a 29, which was in the clinical range. Jonathan's raw score on the CARS-2 was a 40.5 (severe range). During the study, Jonathan attended a half-day special education classroom four days per week and received speech therapy. Jonathan spoke in three to four-word utterances and displayed significant articulation difficulties.

Angela chose playtime routine with brother as the targeted family routine, which occurred in the main living/sleeping area of the house during afternoons. Angela reported that Jonathan engaged in the following challenging behavior: hitting, throwing objects, grabbing others, screaming, and crying/whimpering. Hitting was defined as using an open or closed fist to make forceful contact with another person's body. Throwing objects was defined as making an object (that is not meant to) fly through the air by lifting and extending with force. Grabbing was defined as part of Jonathan's hand touching an item that another person is holding or a part of another person with force and pulling back toward himself. Screaming was defined as making a loud vocal noise above inside room volume using either words or non-words. Crying/whimpering was defined as using a high-pitched vocalization of broken/varying sound.

The results of the pre-baseline FBA suggested that Jonathan's hitting, which Angela indicated was the most concerning behavior, was maintained by access to his mother's attention and preferred tangibles. Angela reported that the current behavioral strategy being implemented was talking to Jonathan in a calm voice. Angela reported utilizing several strategies to reduce her stress including breathing exercises, counting to five and backward from five, taking momentary breaks, talking calmly, and playing games on her iPad™. During the pre-baseline assessment, Angela reported that she would like Jonathan to learn to share items with his brother.

Samantha and Tabitha. Samantha was a Caucasian 31-year old female. She held a bachelor's degree, and her employment status was part time. She reported a history of mental health conditions (post-partum anxiety and depression). Her raw score on the PSI-SF was a 116, which was in the clinically significant range. Her raw score on the CES-D was a 27, which was in the major depressive range. She lived with her husband, who was the biological father of their two children (i.e., the target child and her twin sister, who had Attention Deficit and Hyperactivity Disorder).

The target child, Tabitha, was a 4-year, 9-month-old female. Tabitha's score on the CBCL Aggressive Behavior subscale was a 33, which was in the clinical range. Tabitha's raw score on the CARS-2 was a 33 (mild-moderate range). During the duration of the study, Tabitha attended half-day preschool four days per week and private occupational therapy. She spoke in full sentences with mild articulation difficulties.

Samantha chose clean-up routine as the targeted family routine. The clean-up routine occurred throughout the house, mostly in the living room and children's shared bedroom but occasionally in the bathroom, during the afternoon.

Samantha reported that Tabitha engaged in the following challenging behavior: being off-task, verbal protesting, screaming, whining, and kicking. Off-task was defined as actively ignoring her mother by not picking up items or not being in the designated area. Verbal protesting

was defined as saying "no" or indicating verbally that she did not want to pick up items. Screaming was defined as producing a loud vocal noise above inside room volume with either words or non-word sounds. Whining was defined as producing a high-pitched vocalization of broken/varying sound with or without words. Kicking was defined as extending her leg and foot and making contact with another person with force. The results of the pre-baseline FBA suggested that Tabitha's off-task behavior, which Samantha indicated was the most concerning behavior during the clean-up routine, was maintained by escape. Samantha reported that the current behavioral strategy implemented was breaking tasks down into small steps. Samantha reported utilizing several strategies to reduce her stress including medication, therapy, seeking out special programs, staying organized, and utilizing advice from service providers.

Laura and Richie. Laura was a Caucasian 34-year old female. She held an associate's degree, and her employment status was part time. She did not have a history of mental health conditions. Her raw score on the PSI-SF was a 100, which was in the clinically significant range. Her raw score on the CES-D was a 7, which was in the normal range. She lived with her husband, who was the biological father of their four children. The target child, Richie, was an 8-year, 7-month-old male. The other three children were all male, ages two, four, and six years old, with no learning or behavioral challenges. Richie's score on the CBCL Aggressive Behavior subscale was a 15, which was in the borderline clinical range. Richie's raw score on the CARS-2 was a 33.5 (mild-moderate range). During the duration of the study, Richie attended school in an inclusive setting five days per week with special education support three times per week. He spoke in full intelligible sentences.

Laura chose dinnertime as the targeted family routine. The dinnertime routine occurred in the dining room in the early evening with all four children, the mother, and the father, depending on his schedule. Laura reported that Richie engaged in the following challenging behavior: negative commenting, whining, and spitting out food. Negative commenting was defined as verbally saying negative things about dinner such as, "I'm going to throw up" or indicating that he did not want to eat dinner. Whining was defined as using a high-pitched vocalization of broken/varying sound with or without words. Spitting was defined as food exiting his mouth after it had entered his mouth. The results of the pre-baseline FBA suggested that Richie's negative commenting behavior, which Samantha indicated was the most concerning behavior during the dinnertime routine, was maintained by escape and access to parent attention. Laura reported that the current behavioral strategy she used was setting a timer and requiring that Richie ate the remaining food for breakfast. Laura reported utilizing several strategies to reduce her stress including 1 h per day of independent reading time, having predictable routines, "Mommy and Me" time, planning out the day, and attending girls' night with friends once or twice per month.

All sessions occurred in the families' homes. Research assistants provided childcare to the target child and/or siblings while the first author conducted the training sessions.

4.2. Study design

A single-case concurrent multiple baseline across three mother-child dyads design was employed (Gast & Ledford, 2014) with a within-case randomization-test procedure to control for Type 1 error (Koehler & Levin, 1998; Levin, Ferron, & Gafurov, 2016). Start times for the B phase were randomized using the Koehler-Levin regulated randomization procedure and allowed for the random selection of a restricted range of intervention start times. The Koehler-Levin (1998) procedure combines Wampold and Worsham's (1986) staggered case randomization and Marascuilo and Busk, (1988) start-point randomization. The

first author specified the design characteristics including the earliest possible intervention start point for each case and a possible range of three start points using ExPRT 2.1 software (Levin, Evmenova, & Gafurov, 2014). To randomize the order of the tiers, the first author randomly selected pieces of coded paper.

4.3. Data collection

Data were collected on (a) mother's use of behavioral strategies, (b) mother's self-reported distress, (c) child challenging behavior, and (d) child adaptive, alternative behavior. Prior to and after the single-case experiment, indirect data were collected on perceived (a) mindful parenting state, (b) parental stress level, and (c) depressive symptoms. Sessions were conducted two to three times per week and were between 10 and 20 min ($M = 17$ min).

Data were collected using 10-s partial interval recording. Data were collected on the following antecedent-based strategies: (a) a verbal statement of clarification indicating when attention, when and/or what tangibles, and when escape will be available; (b) provision of an independent activity for the child while the parent is busy; (c) delivery of a prompt for the child to request attention, tangible(s), or a break/escape in a more socially appropriate way; (d) removal of "off limit" items from area; (e) offer alternative items; and (f) provision of an appropriate, alternative means of accessing sensory stimulation. Data were collected on the following consequence-based reinforcement strategies: (a) positive attention following a desired behavior or the absence of an identified challenging behavior (i.e., at least 5 s passed without the target challenging behavior occurring); (b) reinforcing appropriate requests for items/activities by delivering access within 5 s; and (c) reinforcing, at least temporarily, socially appropriate means of requesting escape (e.g., allowing the child a short break). Data were also collected on the following consequence-based strategies that occurred following a challenging behavior: (a) extinction (e.g., ignoring or turning head away for at least 5 s for attention-maintained challenging behavior), (b) redirection efforts to minimize the child escaping an activity, and (c) response blocking of access to sensory behavior.

The number of intervals with a measured behavior (i.e., parent strategy or child challenging behavior) was divided by the total number of intervals and multiplied by 100 to obtain a percentage. Mothers self-reported their level of distress at the beginning of each session using the Subjective Units of Distress Scale (SUDS; Singh et al., 2007) from 0 to 100 (0 = totally relaxed; 100 = highest distress/fear/anxiety/discomfort that you have ever felt).

Training consisted of three weekly sessions with homework in between. Training sessions were approximately 1.5 h in duration ($M = 1.35$ h; range = 1–1.63 h). This allowed time for review of presentation materials, discussion, problem solving, brainstorming development of routine-based support plan, formal meditation practice, and review of homework. Instructional videos and readings were accessed via an online learning management system and sound meditations were available on a mobile application, Practiced Mind™. The training content and homework are presented in Table 1.

Treatment fidelity. An independent observer viewed screencasts, which were captured with QuickTime™ software to assess treatment fidelity using a task analysis for 33% of sessions. Table 2 displays the items in the treatment fidelity task analyses by week. Mean treatment fidelity was 100%.

Homework participation. Between training sessions, mothers were asked to complete homework activities. Mothers used their own iPad™ or computer to access course content. Angela accessed course materials for 2 h 13 min. Angela completed 22 entries using the tracking progress form and two ABC recording entries. Angela completed one audio sound meditation for a total of 5 min 1 s. Samantha accessed course materials for 5 h 6 min. Samantha completed 14 entries using the tracking progress form and three ABC recording entries. Samantha played two audio sound meditations for a total of 6 min 7 s. Laura accessed course materials for 2 h 27 min. Laura completed 15 entries using the tracking progress form and three ABC recording entries. Laura played five sound meditations for a total of 27 min 43 s. All three mothers created routine-based plans, entering them online. A sample routine-based plan is presented in Table 3.

Table 1
Training Content.

| | Session Content | Homework |
|--------------------------|---|--|
| Preparing for the course | | Read "Practiced Routines: Mindful Positive Behavior Support in Family Life" Watched videos on the ABCs of behavior and an introduction to mindful parenting |
| Week One | Overview of PBS within the context of family routines Review of target routines and specific behaviors of concern Practice in collecting frequency, duration, and ABC data Non-judgmental awareness or attention to internal (e.g., body sensations, breath, thoughts, and emotions) and external experiences (e.g., sounds, smells) | Listened to at least 3 sound meditations Watched instructional videos on the topics of recording behavior and identifying patterns Completed entries using the tracking progress and ABC recording forms |
| Week Two | Analyzing patterns of challenging behavior, Choosing function-based behavioral support strategies Creation of a routine-based support plan Mindful parenting intention(s) including creating breathing space and detaching from thoughts | Listened to at least 3 sound meditations Watched 3 videos on antecedent, teaching, and consequence strategies Developed a routine-based support plan Continued to complete entries using the tracking progress form |
| Week Three | Successes and/or struggles of implementation Contextual fit of plan Tracking fidelity of implementation Parental self-compassion Generalization of behavioral strategies to another routine and self-monitoring Planning for ongoing implementation | |

Note. Session content was delivered in person. Homework readings, videos, and data collection forms were accessed via an online learning management system, and sound meditations were available on the Practiced Mind™ mobile application.

Table 2
Treatment Fidelity Task Analyses.

| Week One | Week Two | Week Three |
|--|---|--|
| 1. Reviewed goals for the session, within overall program | 1. Reviewed goals for the session, within overall program | 1. Reviewed goals for the session, within overall program |
| 2. Reviewed positive behavior support process and beliefs about behavior | 2. Facilitated sharing on homework assignments (i.e., goals, tracking, ABC recording, mindfulness practices), getting input from parent | 2. Facilitated sharing on practice assignments (i.e., routine-based plans, tracking progress, mindfulness practices), gathering input from participant |
| 3. Guided participant through Observing Difficult Situation meditation and reflections on external and internal experiences: | 3. Reviewed framework for analyzing patterns surrounding behavior | 3. Guided participant to assess the fidelity of their plan implementation |
| 4. Provided overview of mindfulness in positive behavior support | 4. Guided parent to summarize patterns, as well as perceptions | 4. Guided participant through self-compassion practice, encouraging the participants to share their reflections: |
| 5. Guided participant through Identifying Valued Routines meditation | 5. Provided overview of features of a routine-based plan, function-based interventions and relevant strategies, and broader supports | 5. Discussed the cycle of positive behavior support, emphasizing that the goal of PBS is to enhance quality of life |
| 6. Reviewed defining behaviors to increase/decrease, and brainstormed behaviors to address during routines | 6. Shared videotaped examples of strategies to include in a plan | 6. Guided parent to develop a plan for another routine, sharing ideas |
| 7. Introduced recording behavior and guided practice in different methods (counting, timing, and rating) | 7. Guided parent to develop strategies for their routine-based plan (i.e., proactive, teaching, management, support) | 7. Guided parent to reflect on the program, identifying practices to continue related to PBS and mindfulness and supports for the practices. |
| 8. Reviewed tracking progress form, explaining how to use in program | 8. Discussed overcoming habits associated with automatic parenting through mindfulness practices | 8. Guided parent through the grounding meditation, encouraging reflections on their experience |
| 9. Reviewed A-B-C patterns (and setting events), providing examples | 9. Guided parent through the practice of Creating Breathing Space, offering an opportunity for reflection | 9. Provided a closing for the program |
| 10. Guided participant to observe ABCs in video and report patterns: | 10. Guided parent through the practice of Detaching from Thoughts, offering an opportunity for reflection | |
| 11. Reminded of role sensations, thoughts, feelings, and impulses in ABCs | 11. Discussed issues for putting plans in place related to contextual fit | |
| 12. Reviewed homework assignment, directing to LMS for resources | 12. Reviewed homework assignment, directing to LMS for resources | |

Note. Treatment fidelity was assessed by an independent observer marking yes or no for each item.

Table 3
Example Routine-based Plan.

| Being Proactive (Prevention and Prompting) | Teaching Skills (Replacing Behavior) | Managing Consequences (Responding to Behavior) |
|--|---|--|
| <p>What will we do to prevent problems and prompt positive behavior in this routine? Make the situation better Let him be more involved in the dinner making process.</p> | <p>What will we teach our child to do instead of the problem behavior to get his/her needs met? Say positive things about what he likes about dinner.</p> | <p>How will we provide reinforcement for positive behavior in this routine? Ignore negative comments, praise taking bites of undesired foods. Provide positive feedback and gratitude when “Richie” tells us about his day.</p> |
| <p>Prompt positive behavior Remind him that he gets to earn 3 stickers if he eats dinner without complaining.</p> | <p>What will we encourage our child to do to participate more fully in the routine and/or tolerate difficult situations? Model between ourselves and the other children conversation about what we did today. Remind “Richie” about the sticker rewards.</p> | <p>Provide items or activities following the behavior Stickers for the chart.</p> |
| <p>What strategies will we use to support ourselves and out family so we can be consistent with this plan? Make a weekly meal plan so there aren't surprises and less last minute stress.</p> | <p>How will we know when we are successful (how often/ long will the behavior occur)? Dinner will happen without negative comments and we'll be able to discuss our day.</p> | <p>Allow breaks, delays, or provide assistance with the activity/ task Minimal assistance using the utensils, with the end goal of total appropriate self-feeding.</p> |
| <p>Mindfulness Practices to Support Routine. What practices will I use to increase my awareness during this routine? Positive imagery of dinner during the prep time, along with deep breathing.</p> | | <p>How will we withhold or minimize reinforcement following problem behavior? Less stickers for negativity.</p> |
| <p>Changing Settings and Creating Supports. What broader changes will we make such as enlisting others, restructuring the environment or daily activities, and supporting relationships? Get information from “Richie's” teacher on what they're studying in school to provide conversation material.</p> | | |

Note. The routine-based plans were entered online in the learning management system. The example shown here was created by Laura during Week 2 homework.

Coaching. A C phase was instituted if the child's challenging behavior did not reduce to at or below 20% of intervals for three consecutive sessions following the last week of the training, which occurred for Tabitha. The first author revised Samantha's routine-based support plan. Coaching consisted of verbal prompts, praise, and error correction. An independent observer collected fidelity for 30% of coaching sessions (task analysis available from first author upon request). Mean treatment fidelity was 100%.

Interobserver agreement (IOA). IOA data were collected for a mean of 46.29% of baseline sessions (range = 44.44%–50%) and 29.17% (range = 25.00%–50%) of intervention sessions across the three dyads, and 33.33% of coaching sessions for dyad two. Interval-by-interval IOA was calculated by dividing the number of agreements by the total agreements plus disagreements and multiplying by 100 to obtain a percent of agreement for occurrences and nonoccurrences (Gast & Ledford, 2014). For dyad one, IOA for Angela's behavioral strategy use was a mean of 97.39% (range = 91.67%–100%). IOA for Jonathan's challenging behavior was a mean of 97.50% (range = 95.67%–100%). For dyad two, IOA for Samantha's behavioral strategy use was 97.70% (range = 84.42–100%). IOA for Tabitha's challenging behavior was a mean of 95.33% (range = 85.26%–100%). For dyad three, Laura's behavioral strategy use was 96.61% (range = 90%–100%). IOA for Richie's challenging behavior was $M = 93.16%$ (range = 87.69%–100%).

Social validity. Following the intervention phase, mothers completed a 15-item questionnaire assessing the acceptability and feasibility of the program modified from the Treatment Acceptability Rating Form Revised (TARF-Reimers & Wacker, 1988). Items were rated on a 5-point Likert scale. Each mother ranked the intervention moderately positively with mean ratings of 4.52 (range = 4.33–4.80), 4.77 (range = 4.50–5), and 3.42 (range = 2.75–3.75), for the acceptability of interventions, effectiveness of interventions, and disadvantages of strategies, respectively. Table 4 presents social validity data (see Table 4).

5. Results

5.1. Dyad one

Angela selected reinforcement (e.g., praise, cuddles, attention in exchange for good behavior) and extinction strategies. During baseline, Angela's mean use of behavioral strategies that she selected in her routine-based behavior support plan was 2.25% of intervals (range = 0%–5.00%). During the intervention phase, Angela's mean use of selected behavioral strategies was 5.94% of intervals (range = 2.50%–13.33%). During baseline, Angela's mean self-reported stress score was 36.67 (range = 20–80). During the intervention phase, Angela's mean self-reported stress score was 46.25 (range = 30–60). During baseline, Jonathan engaged in challenging behavior a mean of 3.33% of intervals (range = 0%–5.80%). During the intervention phase, Jonathan engaged in challenging behavior a mean of 2.29% of intervals (range = 0%–3.33%). During baseline, Jonathan shared a mean of 0.5 items (range = 0–3). During intervention,

Jonathan shared a mean of 0.38 items (range = 0–2) with his brother.

5.2. Dyad two

Samantha selected antecedent (e.g., “Clean up as close to when the mess is made as possible to minimize the task ...”); reinforcement (e.g., “... play game on tablet for short time after clean up routine”); and management strategies for her routine-based plan. During baseline, Samantha's mean use of selected behavioral strategies was 2.22% of intervals (range = 0%–6.67%). During the intervention phase, Samantha's mean use of selected behavioral strategies was 19.49% of intervals (range = 0.88%–42.42%). During the coaching phase, Samantha's mean use of selected behavioral strategies was 36.40% of intervals (range = 22.50%–57.38%). During baseline, Samantha's mean self-reported stress score was 73.33 (range = 60–90). During the intervention phase, Samantha's mean self-reported stress score was 60.63 (range = 50–70). During the coaching phase, Samantha's mean self-reported stress score was 57.50 (range = 50–80). During baseline, Tabitha engaged in challenging behavior a mean of 98.89% of intervals (range = 91.67%–100%). During the intervention phase, Tabitha engaged in challenging behavior a mean of 64.20% of intervals (range = 0%–100%). During the coaching phase, Tabitha engaged in challenging behavior a mean of 53.72% of intervals (range = 0%–88.79%). During baseline, Tabitha put away a mean of 0.44 items (range = 0–3) into their correct locations. During the intervention phase, Tabitha put away a mean of 15 items (range = 0–52) into their correct locations. During the coaching phase, Tabitha put away a mean of 23 items (range = 10–53) into their correct location.

5.3. Dyad three

Laura's selected strategies included reinforcement and extinction (see Table 2). During baseline, Laura's mean use of selected behavior strategies was 4.05% of intervals (range = 0%–5.26%). During the intervention phase, Laura's mean use of selected behavior strategies was 10.67% of intervals (range = 6.45%–17.21%). During baseline, Laura's mean self-reported stress score was 45.83 (range = 30–60). During the intervention phase, Laura's mean self-reported stress score was 24 (range = 10–40). During baseline, Richie engaged in challenging behavior a mean of 23.30% of intervals (range = 5.75%–64.49%). During the intervention phase, Richie engaged in challenging behavior a mean of 5.34% of intervals (range = 0%–20.25%). During baseline, Richie ate food a mean of 45.51% of intervals (range = 21.50%–77.01%). During intervention, Richie ate food a mean of 44.90% of intervals (range = 32.67%–52.46%).

5.4. Standardized mean difference analysis

A between-cases standardized mean difference analysis, Hedges' g (Hedges, 1981), was calculated using the DHPS SPSS macro. Hedges' g is an effect size calculated similarly to a standard Cohen's d effect size (0.2 = small, 0.5 = medium, 0.8 = large), wherein control means are subtracted from treatment means and divided by standard error. Hedges' g allowed for the small sample size in this study and took into account the (a) number of cases, (b) number of measurements per case, (c) autocorrelation, and (d) intra-class correlation, measuring the ratio of between-case variance to the sum of between and within case variance (Hedges, Pustejovsky, & Shadish, 2012; Shadish et al., 2014). For parent selected behavioral strategy use, Hedges' $g = 1.02$. For parent stress, Hedges' $g = 0.32$. Lastly, for child challenging behavior, Hedges' $g = 0.24$. No statistical analyses were run on the C phase. Fig. 1 displays parent selected strategy use, and Fig. 2 displays parent self-reported stress.

Table 4
Social validity ratings.

| Item category | Angela | Samantha | Laura |
|---------------|--------|----------|-------|
| Acceptability | 4.42 | 4.80 | 4.33 |
| Effectiveness | 4.50 | 5.00 | 4.80 |
| Disadvantages | 2.75 | 3.75 | 3.75 |

Note. Scores in the disadvantages of strategies category were reversed scored. Higher scores represent fewer disadvantages.

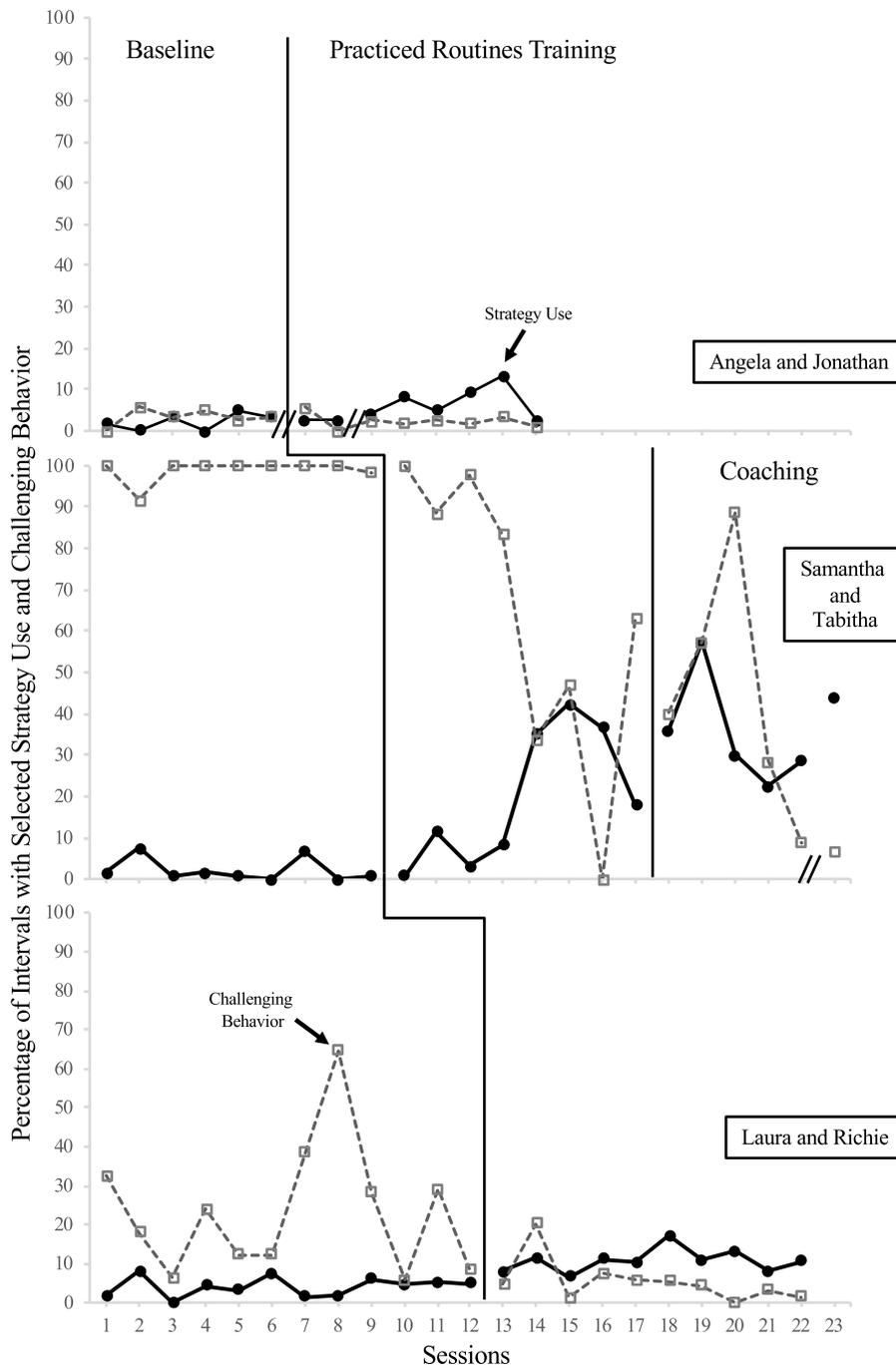


Fig. 1. Mother-child dyad behavioral data. This figure displays mothers' use of behavioral strategies selected in her routine-based support plan and child challenging behavior. Only independent (i.e., unprompted) responses are graphed in the coaching phase for tier two.

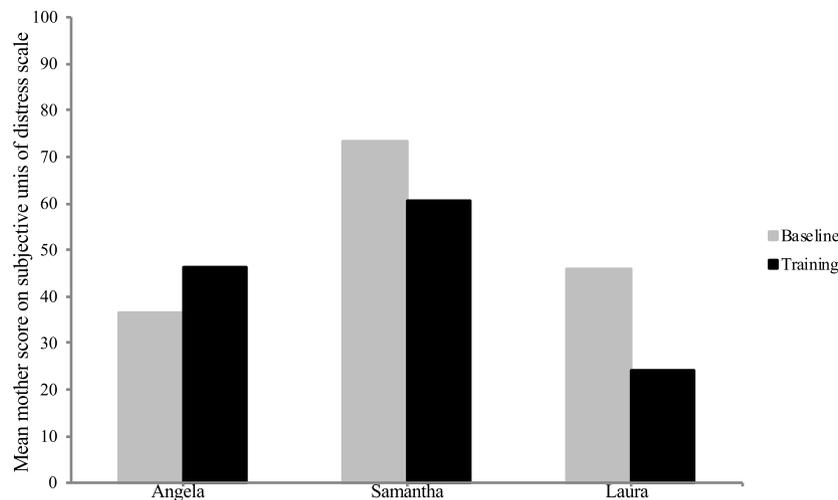


Fig. 2. Mothers' self-reported stress. This figure displays the mean scores of each mother's self-reported subjective units of distress.

6. Discussion

We evaluated the effects of a brief mindfulness-infused parent training program on three outcomes – behavioral strategy use, distress, and child challenging behavior in three mother-child dyads. For behavioral strategy use, Angela, displayed minimal change, Samantha displayed a delayed change in level, and for Laura, there were minimal overlapping data. For maternal distress, mean scores decreased for two participants and increased for Angela. Additionally, individual topographies of child challenging behavior were measured. Jonathan's observed challenging behavior was incongruent with parent report, and floor effects were observed across phases. Tabitha engaged in near ceiling levels of challenging behavior in baseline. After the routine-based plan was developed, no overlapping data were observed, and her desired behavior increased substantially. In baseline, Tabitha put away a mean of 0.44 items and during the training phase, she put away a mean of 15 items. Richie's challenging behavior decreased in level, trend, and variability. Notable standardized effects were found with the Hedges' g analysis. A large effect was found for mothers' selected behavioral strategy use (Hedges' $g = 1.02$), a small-moderate effect for parent stress (Hedges' $g = 0.32$), and a small effect for child challenging behavior (Hedges' $g = 0.24$). Taken as a whole, the standardized mean difference analysis combined with visual analysis suggest a medium effect on parent strategy use, and small-moderate effects on parenting stress and child challenging behavior (Hedges et al, 2012).

6.1. Implications, limitations, and future directions

Data suggest that the Practiced Routines program may be effective, but that parental characteristics may play a role in treatment outcomes. The program produced clinically significant effects on all outcome measures for Laura, some for Samantha, while mixed and contradicted results were found for Angela. Laura, who showed positive outcomes across all measures, was the only mother without clinically significant depressive symptoms at screening. In contrast, Angela had elevated depressive symptoms, multiple health conditions, and also reported dental pain and financial stressors during the intervention phase. These variables may have also influenced her decision to decline coaching. Samantha reported a lack of co-parenting support contributed to her stress, and she also reported mental health conditions and clinical levels of depression, but opted to participate in coaching when offered.

These differences in dyads highlight the potential impact of contextual variables that inevitably affect response to intervention.

Furthermore, this intervention was of relatively low intensity and did not involve performance feedback. It is likely that certain characteristics (e.g., low depressive symptoms, co-parenting support) enable a parent to be successful with a low-dose training. Child challenging behavior may also explain the observed outcomes. Specifically, Tabitha engaged in challenging behavior at near ceiling levels throughout the baseline phase. When a child's behavior is highly aberrant, best practice may indicate immediate practice-based coaching. Future research should systematically examine family, parent, and child level variables that predict response-to-treatment for scalability purposes. Further, as a field, the dosage of training needed to produce durable parenting behavior change that results in sustainable behavior change is unknown. Further, it is unclear when or for whom coaching is necessitated. There are possible advantages and limitations of coaching. Too much modeling, prompting, and performance feedback may jeopardize a parent's ability to generalize and adapt strategies. Yet, some parents may require an errorless approach, and training without feedback might cause more distress. Uncovering family dynamics (e.g., co-parenting structure, socioeconomic status, sibling dynamics), parent characteristics (e.g., mental health risk), and child characteristics (e.g., ASD symptoms, clinical risk of challenging behavior) that would inform parent education decision-making processes is a useful area of future research. For families similar to dyad one, it might be necessary to address family or parent level variables (e.g., physical pain and mental health symptoms) before beginning to target child level behavior change.

Investigations into the potential additive benefits of mindfulness to existing behavioral parent training programs is another area for future research. Randomized trials (comparing the effects of behavioral-only parent training and behavioral plus mindfulness training) or designs that allow for adaptive intervention such as sequential multiple assignment randomized trials (SMART) studies would be logical next steps. Such trials would allow for analyses to be conducted that may elucidate which families only need training, which benefit from coaching with performance feedback, and which need the addition of stress-reduction strategies. The collection of longitudinal data would help evaluate if the addition of mindfulness enables parents to sustain use of behavioral strategies or aids in their adaptation of strategies across contexts and time as well as what effects mindfulness may have on their well-being over time.

The current study contributes to the limited literature base on mindfulness-based behavioral parent training. Parents of children with ASD are at an increased risk for stress and depression, yet limited attention has been given to systematically addressing mental health within parent training programs for this population (Frantz et al.,

2018). A few studies have incorporated therapeutic strategies such as optimism (e.g., Durand, Hieneman, Clarke, Wang, & Rinaldi, 2012) and mindfulness training (e.g., Singh et al., 2006) within training for parents of children with developmental disabilities. While promising outcomes have been found, interventions lasted between 8 and 12 weeks compared to our brief program.

In the current investigation, we hypothesized that mindfulness training and strategies acted as a protective skillset that allowed mothers to implement behavioral strategies without judging themselves (e.g., “Am I doing this right?”) and with more self-compassion and flexibility. Additionally, mothers verbally shared private events during reflection activities, which could have increased their awareness of how their moods affect interactions with their child. Being more mindful during parent-child interactions could decrease the value of escape from an unpleasant interaction. Certain extinction (e.g., planned ignoring) and non-aversive punishment (e.g., redirection using a neutral tone of voice) strategies might be difficult for a parent to carry out when experiencing psychological or emotional distress. For example, a parent may want to avoid emotional responding from the child and subsequent unpleasant private events (thoughts, emotions, and body sensations) associated with this interaction.

Some limitations are worth noting. First, generalization was not assessed. All families had siblings present during every session. Given family dynamics and competing reinforcement contingencies (e.g., sibling seeks attention), it would be useful to assess generalization across other children and routines. Further, mothers were not instructed to implement a strict plan scored on a task analysis as is common in ASD parent training (Brookman-Fraze, Stahmer, Baker-Ericzen, & Tsai, 2006). The plans were flexible, and adaptation based on data was encouraged. The measurement procedures may not have fully captured behavioral strategy use. For instance, Laura’s routine-based plan included a reminder of Richie’s sticker chart before dinner, deep breaths, and positive imagery while preparing dinner. Because data collection began once dinner was on the table, these strategies were not included in the interval recording system. Several stimuli were also not controlled for in this study, including play materials, type or size of items put away, and type or amount of food. While this is closely aligned with “real world” practices, it limits the internal validity of this study.

Finally, due to the dual-randomization procedure, the experimental control was compromised. Specifically, had traditional response-guided single-case design logic been used, case order and phase lengths would have been different. However, it should be noted that would have comprised the logic of employing randomization. Utilizing randomization schemes may enhance the credibility of single-case design and allow such research to reach a broader audience; see Kratchowill and Levin (2010) for a conceptual paper. Researchers should weigh the pros and cons of both approaches when designing future studies.

6.2. Considerations for practice

The current study was highly applied and differs from tightly controlled behavior analytic parenting training studies. Mothers were not required to implement plans scored on a task analysis checklist, and the setting and stimuli were flexible and based on naturally occurring environmental variables. Several strengths are worth noting including: (a) the business as usual baseline; (b) routine-based plan implemented by the child’s mother (i.e., natural change agent) in their home setting; and (c) parent-friendly, non-technical training procedures. These applied features may enhance the external validity of the findings. The Practiced Routines program would likely be easy to replicate in practice; however, specialized training would be required for service providers to be competent in behavioral strategies and mindfulness. Current recommended practices for early intervention include family-capacity building and use functional assessment and strategies to prevent and address challenging behavior (Division for Early Childhood, 2014). Practitioners may not be equipped to educate parents in stress

reduction strategies. Because parents of children with ASD are at a uniquely high risk for stress (Silva & Schalock, 2012), it would be useful for service providers to offer stress-reduction skills training as an adjunctive support to traditional ABA approaches, especially for at-risk families. In addition to educational early intervention delivery systems, 46 states offer behavioral health services to children with ASD (National Conference of State Legislatures, 2017). These services are often behavior analytic and may include parent training (e.g., Michigan Department of Insurance and Financial Services, 2013). Thus, with adequate training, the Practiced Routines program might be a viable option for educational or behavioral health practitioners, especially for families placed on waitlists.

Acknowledgements

This research was partially funded through The Engaging New Leaders in Implementation Science Training Leadership Grant of the United States Department of Education Office of Special Education Programs and a dissertation research award from the University of Oregon College of Education.

References

- Abidin, R. R. (1992). The determinants of parenting behavior. *Journal of Clinical Child Psychology, 21*, 407–412.
- Abidin, R. R. (2012). *Parenting stress index* (4th ed.). Lutz, FL: PAR.
- Achenbach, T. M., & Rescorla, L. A. (2000). *Manual for the ASEBA preschool forms and profiles*. Burlington, VT: University of Vermont Department of Psychiatry.
- Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA school-age forms and profiles*. Burlington, VT: University of Vermont, Research Center for Children (Youth, and Families).
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Baghdadi, A., Pascal, C., Grisli, S., & Aussilloux, C. (2003). Risk factors for self-injurious behaviours among 222 young children with autistic disorders. *Journal of Intellectual Disabilities Research, 47*, 622–627.
- Brookman-Fraze, L., Stahmer, A., Baker-Ericzen, M. J., & Tsai, K. (2006). Parenting interventions for children with autism spectrum and disruptive behavior disorders: Opportunities for cross-fertilization. *Clinical Child and Family Psychology Review, 9*, 181–200.
- Brown, K. W., Creswell, J. D., & Ryan, R. M. (2015). *Handbook of mindfulness: Theory, research, and practice*. New York, NY: The Guilford Press.
- Cantwell, J., Muldoon, O. T., & Gallagher, S. (2014). Social support and mastery influence the association between stress and poor physical health in parents caring for children with developmental disabilities. *Research in Developmental Disabilities, 35*, 2215–2223.
- Dabrowska, A., & Pisula, E. (2010). Parenting stress and coping styles in mothers and fathers of pre-school children with autism and Down syndrome. *Journal of Intellectual Disability Research, 54*, 266–280.
- Deater-Deckard, K., & Scarr, S. (1996). Parenting stress among dual-earner mothers and fathers: Are there gender differences? *Journal of Family Psychology, 10*, 45.
- Division for Early Childhood. (2014). *DEC Recommended practices in early intervention/early childhood special education 2014*. Retrieved from <http://www.dec-spced.org/recommended-practices>.
- Duncan, L. G., Coatsworth, J. D., & Greenberg, M. T. (2009). A model of mindful parenting: Implications for parent-child relationships and prevention research. *Clinical Child and Family Psychology Review, 12*, 255–270.
- Dunlap, G., Newton, S. J., Fox, L., Benito, N., & Vaughn, B. (2001). Family involvement in functional assessment and positive behavior support. *Focus on Autism and Other Developmental Disabilities, 16*, 215–217.
- Durand, V. M., Hieneman, M., Clarke, S., Wang, M., & Rinaldi, M. L. (2012). Positive family intervention for severe challenging behavior I: A multisite randomized clinical trial. *Journal of Positive Behavior Interventions, 15*, 133–143.
- Fettig, A., & Barton, E. E. (2014). Parent implementation of function-based intervention to reduce children’s challenging behavior: A literature review. *Topics in Early Childhood Special Education, 34*, 49–61.
- Frantz, R., Hansen, S., & Machalicek, W. (2018). Interventions to increase well-being among parents of children with autism. *Review Journal of Autism and Developmental Disabilities, 5*, 58–77.
- Gast, D. L., & Ledford, J. R. (Eds.). (2014). *Single-Subject Research Methodology: Applications in Special Education and Behavioral Sciences* (2nd ed.). Routledge.
- Grindle, C. F., Kovshoff, H., Hastings, R. P., & Remington, B. (2009). Parents’ experiences of home-based applied behavior analysis programs for young children with autism. *Journal of Autism and Developmental Disorders, 39*, 42–56.
- Hartley, S. L., Papp, L. M., & Bolt, D. (2016). Spillover of marital interactions and parenting stress in families of children with autism spectrum disorder. *Journal of Clinical Child and Adolescent Psychology, 1–12*.
- Hedges, L. V. (1981). Distribution theory for Glass’s estimator of effect size and related estimators. *Journal of Educational Statistics, 6*, 107–128.
- Hedges, L. G., Pustejovsky, J. E., & Shadish, W. R. (2012). A standardized mean difference

- effect size for multiple baseline designs across individuals. *Research Synthesis Methods*, 4, 324–341.
- Herrler, 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.
- Jones, L., Hastings, R. P., Totsika, V., Keane, L., & Rhule, N. (2014). Child behavior problems and parental well-being in families of children with autism: The mediating role of mindfulness and acceptance. *American Journal on Intellectual and Developmental Disabilities*, 119, 171–185.
- Kabat-Zinn, J. (1990). *Full catastrophe living*. New York, NY: Bantam Doubleday Dell.
- Kabat-Zinn, M., & Kabat-Zinn, J. (1997). *Everyday blessings: The inner work of mindful parenting*. New York, NY: Hyperion.
- Kanne, S. M., & Mazurek, M. O. (2011). Aggression in children and adolescents with ASD: Prevalence and risk factors. *Journal of Autism and Developmental Disorders*, 41, 926–937.
- Koehler, M. J., & Levin, J. R. (1998). Regulated randomization: A potentially sharper analytical tool for the multiple-baseline design. *Psychological Methods*, 3, 206–217.
- Kuhlthau, K. A., Bloom, S., Van Cleave, J., Knapp, A. A., Romm, D., Klatka, K., et al. (2011). Evidence for family-centered care for children with special health care needs: A systematic review. *Academic Pediatrics*, 11, 136–143.
- Lecavalier, L., Leone, S., & Wiltz, J. (2006). The impact of behaviour problems on caregiver stress in young people with autism spectrum disorders. *Journal of Intellectual Disability Research*, 50, 172–183.
- Levin, J. R., Evmenova, A. S., & Gafurov, B. S. (2014). The single-case data-analysis ExPRT (excel package of randomization tests). In T. R. Kratochwill, & J. R. Levin (Eds.). *Single-case intervention research: Methodological and Statistical Advances* (pp. 185–219). Washington, DC: American Psychological Association.
- Levin, J. R., Ferron, J. M., & Gafurov, B. S. (2016). Comparison of randomization-test procedures for single-case multiple-baseline designs. *Developmental Neurorehabilitation*. <https://doi.org/10.1080/17518423.2016.1197708> Advance online publication.
- Lindgren, S., Wacker, D., & Suess, A. (2016). Telehealth and autism: Treating challenging behavior at lower cost. *Pediatrics*, 137, 167–175.
- Lucyshyn, J. M., Fossett, B., Bakeman, R., Cheremshynski, C., Miller, L., Lohrmann, S., et al. (2015). Transforming parent-child interactions in family routines: Longitudinal analysis with families of children with developmental disabilities. *Journal of Child and Family Studies*, 24, 3526–3541.
- Machalicek, W., Lequia, J., Pinkelman, S., Knowles, C., Raulston, T., Davis, T., et al. (2016). Behavioral telehealth consultation with families of children with autism spectrum disorder. *Behavioral Interventions*, 31, 223–250.
- Marascuilo, A., & Busk, P. (1988). Combining statistics for multiple-baseline AB and replicated ABAB designs across subjects. *Behavioral Assessment*, 10, 1–28.
- Matson, J. L., & Vollmer, T. R. (1995). *The Questions About Behavioral Function (QABF) User's Guide*. Baton Rouge, LA: Scientific Publishers.
- McWilliam, R. A. (2009). *Routines based early intervention*. Baltimore, MD: Brookes Publishing.
- Michigan Department of Insurance and Financial Services (2013). *Autism coverage reimbursement program standard billing codes and descriptions for ABA*. Retrieved from https://www.michigan.gov/documents/difs/Autism_Fund_MI_ABA_Standard_Billing_Codes_415943_7.pdf.
- National Autism Center. (2015). *Findings and conclusions: National standards project, phase 2*. Retrieved from <http://www.nationalautismcenter.org/resources>.
- National Conference of State Legislators. (2017, June 7). Autism and insurance coverage. *State laws*. Retrieved from <http://www.ncsl.org/research/health/autism-and-insurance-coverage-state-laws.aspx>.
- National Institutes of Health United States Library of Medicine (2018). *ASD parent trainer: Online coaching for parents of children with autism (APT)*. (Clinicaltrials.gov Identifier NCT02469870). Retrieved from: https://clinicaltrials.gov/ct2/show/study/NCT02469870?show_desc=Y#desc.
- Neece, C. L. (2014). 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*, 27, 174–186.
- 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.
- Osborne, L. A., McHugh, L., Saunders, J., & Reed, P. (2008). Parenting stress reduces the effectiveness of early teaching interventions for autistic spectrum disorders. *Journal of Autism and Developmental Disorders*, 38, 1092–1103.
- O'Neill, R. E., Horner, R. H., Albin, R. W., Sprague, J. R., Storey, K., & Newton, J. S. (1997). *Functional Assessment and Program Development for Problem Behavior*. Pacific Grove, CA: Brooks/Cole Publishing.
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385–401.
- Reimers, T. M., & Wacker, D. P. (1988). Parents' ratings of the acceptability of behavioral treatment recommendations made in an outpatient clinic: A preliminary analysis of the influence of treatment effectiveness. *Behavioral Disorders*, 14, 7–15.
- Remington, B., Hastings, R. P., Kovshoff, H., Degli Espinosa, F., Jahr, E., Brown, T., & Ward, N. (2007). Early intensive behavioral intervention: Outcomes for children with autism and their parents after two years. *American Journal on Mental Retardation*, 112, 418–438.
- Ruppert, T., Machalicek, W., Hansen, S., Raulston, T., & Frantz, R. (2016). Parent implemented early intervention. In R. Lang, T. Hancock, & N. N. Singh (Eds.). *Early Intervention for Young Children with Autism*. New York, New York: Springer.
- Schopler, E., Van Bourgondien, M. E., Wellman, G. J., & Love, S. R. (2010). *Childhood Autism Rating Scale* (2nd ed.). Los Angeles: Western Psychological Services.
- Shadish, W. R., Hedges, L. V., Pustejovsky, J., Boyajian, J. G., Sullivan, K. J., Andrade, A., et al. (2014). A d-statistics for single-case designs that is equivalent to the usual between-groups d-statistic. *Neuropsychological Rehabilitation*, 24, 528–553.
- Silva, L. M., & Schalock, M. (2012). Autism parenting stress index: Initial psychometric evidence. *Journal of Autism and Developmental Disorders*, 42, 566–574.
- Singh, N. N., Lancioni, G. E., Winton, A. S. W., Fisher, B. C., Wahler, R. G., McAleavey, K., et al. (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., Lancioni, G. E., Winton, A. S. W., Karazsia, B. T., Myers, R. E., Latham, L. L., et al. (2014). Mindfulness-based positive behavior support (MBPBS) for mothers of adolescents with Autism Spectrum Disorder: Effects on adolescents' behavior and parental stress. *Mindfulness*, 5, 646–657.
- Singh, N. N., Lancioni, G. E., Winton, A. S. W., Singh, J., Curtis, W. J., Wahler, R. G., et al. (2007). Mindful parenting decreases aggression and increases social behavior in children with developmental disabilities. *Behavior Modification*, 6, 749–771.
- Strauss, K., Vicari, Stefano, V., Valeri, G., D'Elia, L., Arima, S., et al. (2012). Parent inclusion in early intensive behavioral intervention: The influence of parental stress, parent treatment fidelity and parent-mediated generalization of behavior targets on child outcomes. *Research in Developmental Disabilities*, 33, 688–703.
- Totsika, R. P., Hastings, E., Emerson, G. A., Lancaster, D. M., & Berridge (2011). A population-based investigation of behavioural and emotional problems and maternal mental health: Associations with autism spectrum disorder and intellectual disability. *Journal of Child Psychology and Psychiatry*, 52, 91–99.
- Wampold, B. E., & Worsham, N. L. (1986). Randomization tests for multiple-baseline designs. *Behavioral Assessment*, 8, 135–143.
- Weitlauf, A. S., Vehorn, A. C., Taylor, J. L., & Warren, Z. E. (2014). Relationship satisfaction, parenting stress, and depression in mothers of children with autism. *Autism*, 18, 194–198.