


Mindful Parenting Decreases Aggression and Increases Social Behavior in Children With Developmental Disabilities

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A mindfulness-based strategy for self-management of aggressive behavior in adolescents with autism

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ABSTRACT

Some individuals with autism engage in physical aggression to an extent that interferes with not only their quality of life, but also that of their parents and siblings. Behavioral and psychopharmacological treatments have been the mainstay of treatments for aggression in children and adolescents with autism. We evaluated the effectiveness of a mindfulness-based procedure, *Meditation on the Soles of the Feet*, in helping three adolescents to manage their physical aggression. This procedure required the adolescents to rapidly shift the focus of their attention from the aggression-triggering event to a neutral place on their body, the soles of their feet. Incidents of aggression across the three adolescents ranged from a mean of 14–20 per week during baseline, 4–6 per week during mindfulness training, including zero rates during the last 4 weeks of intervention. Aggression occurred a rate of about 1 per year during a 3-year follow-up. Our results suggest adolescents with autism can learn, and effectively use, a mindfulness-based procedure to self-manage their physical aggression over several years.

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1. Introduction

Current epidemiological research suggests an increasing prevalence of autism spectrum disorder (ASD) during the last decade (Matson & Kozlowski, 2011). In recent studies, Kogan et al. (2009) reported 110 per 10,000 point-prevalence of parent-reported diagnosis of ASD among US children aged 3–17 years in 2007, and the Center for Disease Control and Prevention (CDC, 2009) reported 90 per 10,000. Even when variation in terms of age of the children, gender, race/ethnicity, and sociometric status, and survey sample size is taken into account, the prevalence of ASD appears to be increasing dramatically. Further, although early behavioral interventions may provide a positive prognosis for some children (Matson & Smith, 2008; Peters-Scheffer, Didden, Korzilius, & Sturmey, 2011), this is a lifelong condition with its attendant educational, social, and therapeutic challenges for the majority of children with ASD.

Many children with ASD will evince challenging behaviors in their developmental years, and for some these behaviors will persist in adolescence and adulthood. Although there is a paucity of prevalence studies on these types of behaviors in individuals with ASD, rates as high as 45% have been reported (Poppes, Putten, & Vlaskamp, 2010). Challenging behaviors, especially aggression, often constitute major barriers to independence and a reasonable quality of life in the community (Hastings, 2002; Singh, Lancioni, Winton, & Singh, in press).

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The most common interventions for aggressive behaviors in individuals with ASD are based on principles and procedures derived from applied behavior analysis and positive behavior support (Carr, 2007; Carr et al., 2002). The most effective behavioral interventions are based on a functional assessment technology that enables researchers and clinicians to derive and test hypotheses about the functions of aggression in specific settings (Matson, 2009; Matson & Nebel-Schwalm, 2007). Typically, at least one intervention is clearly aligned with the key function of the aggressive behavior. The interventions vary in scope, ranging from a single focus (e.g., to eliminate aggressive behavior) to multiple foci (e.g., to eliminate aggressive behavior, teach social interaction skills, and improve quality of life). Generally, behavioral interventions for aggression in individuals with autism can be broadly divided into three groups: (a) antecedent strategies; (b) instructional strategies; and (c) contingency management strategies (see Singh, Lancioni, Winton, & Singh, *in press*, for a review). Current evidence suggests that to varying degrees, all three strategies produce good control of aggressive behavior in individuals with autism, at least in the short term (Matson, 2009; Singh, Lancioni, Winton, & Singh, *in press*).

The second most common intervention for aggressive behaviors of individuals with ASD involve psychopharmacotherapy (Matson & Neal, 2009). Current research data are not very impressive regarding the effectiveness of psychopharmacotherapy for aggressive behavior in this population (Singh, Lancioni, Winton, & Singh, *in press*). There is suggestive evidence that one typical antipsychotic drug (i.e., haloperidol) and six atypical or new generation antipsychotics (i.e., risperidone, olanzapine, quetiapine, clozapine, ziprasidone, and aripiprazole) may be useful in reducing aggression in individuals with ASD. The evidence for the effectiveness of antidepressant drugs (i.e., fluvoxamine, fluoxetine, and sertraline) is much slimmer, and there is no good current evidence that any other class of drugs is effective in treating aggression in this population.

Both behavioral and psychopharmacological interventions for individuals with autism rely on external agents (e.g., parents, caregivers, and teachers) to administer the programmed contingencies or medications. However, the zeitgeist is to enable individuals with disabilities to learn self-management skills that will enable them to regulate their own behaviors and to achieve self-selected goals (Singh, Lancioni, Winton, Adkins, et al., *in press*). A strength of this approach is that self-management procedures avoid problems of generalization and maintenance because individuals are able to use the procedures in multiple settings, provide immediate self-reinforcement, and apply them to covert behaviors, thoughts, and feelings. In this context, the role of caregivers is to assist the individuals to select appropriate self-management strategies that match their cognitive ability, teach the individuals to use the strategies, provide support and encouragement, and generally be their cheer leaders as they learn, practice, and correctly use the selected techniques. It is well established that individuals with intellectual disabilities, particularly those with mild disabilities, can learn and use self-management strategies (e.g., Taylor, Novaco, Gillmer, Robertson, & Thorne, 2005). Research suggests that these individuals are able not only to accurately report their own emotional states, but also to respond appropriately to them (Rose, West, & Clifford, 2000). Whether these findings apply to individuals with autism who are aggressive is yet to be established.

There is an emerging body of research that attests to the effectiveness of mindfulness-based procedures in assisting individuals with intellectual disabilities to self-manage their challenging behaviors (Singh, Lancioni, Winton, Adkins, et al., *in press*; Singh, Winton, et al., 2006). For example, *Meditation on the Soles of the Feet* (SoF) has been shown to be reasonably effective for self-management of aggression, disruption, and property destruction by individuals with intellectual disabilities (Singh, Lancioni, Winton, Adkins, et al., *in press*). By using SoF, individuals can divert attention from an emotionally arousing thought, event, or situation that may lead to aggressive behavior to an emotionally neutral part of the body, the soles of the feet. The individual learns to stop, focus the mind back on the body, calm down, and then make a choice about how to react to the thought, event, or situation that triggered the aggressive behavior. Our experience with this mindfulness procedure strongly suggests that, once it is mastered to the point of automaticity, the individual can use it in multiple contexts, whether sitting, standing or walking slowly. SoF provides the individual with an internalized response that is portable, easy to master, and can be accessed in almost any situation.

In a previous study, we reported that when parents of children with autism are taught mindfulness practices, their children's challenging behavior, including aggression, decreased in the absence of direct intervention with the children (Singh, Lancioni, et al., 2006; Singh, Winton, et al., 2006). This indicated to us that children with autism could detect and respond to presumed mindful parenting behaviors, thereby producing changes in their challenging behaviors. In the present study, we were interested in investigating whether adolescents with autism would be able to master SoF and use it effectively to manage their relatively high rates of aggressive behavior towards their siblings and parents, in the absence of mindfulness training for the parents.

2. Method

2.1. Participants

Three adolescents participated. Each adolescent had received a clinical diagnosis of autism spectrum disorder from a child psychiatrist. They lived at home with their families and attended local schools. All three had been referred for intervention because of relatively high rates of aggressive behavior at home. Mike was a 14-year-old boy in the 6th grade, had two older brothers and a sister, and engaged in hitting and kicking family members. Chris was a 16-year-old boy in the 9th grade, had an older brother, and engaged in hitting, kicking and biting family members. Steve was a 17-year-old boy in the 10th grade, had two younger sisters and one brother, and engaged in kicking and biting family members. All three adolescents had been prescribed psychotropic medications to control their aggressive behavior, but without any lasting effects. The parents had

received behavioral training in managing their children, as well as individualized behavior interventions for their son's aggression, but they were unable to manage their aggressive behavior in the long term.

2.2. Target behavior, measurement, and reliability

The target behavior was physical aggression, which was defined as hitting, kicking, and biting a sibling or parent. In previous studies using SoF with individuals with disabilities (e.g., Singh, Wahler, Adkins, & Myers, 2003; Singh, Lancioni, Singh Joy, et al., 2007; Singh, Lancioni, Winton, Adkins, Singh, et al., 2007; Singh, Lancioni, Winton, Adkins, Wahler, et al., 2007), we required the participants to collect data on their own behavior. We suspected that this would cause undue stress to the adolescents in the present study. Thus, data were collected by the individual's siblings and parents during the time the adolescents were together with them each day.

Reliability was assessed by comparing the data of the siblings with the data of the parents if both siblings and parents were present when an incident of aggression occurred. This occurred 46%, 39%, and 73% for Mike, Chris, and Steve, respectively, across baseline and all experimental conditions. An agreement was defined as both siblings and parents recording the same aggressive act as occurring at about the same time. Percentage of inter-rater agreement was calculated for the whole period of observation by dividing agreements by agreements plus disagreements and multiplying by 100. Agreement in each case was 100%, probably due to the very discrete nature of the target behaviors.

2.3. Experimental design and procedure

2.3.1. Experimental design

A multiple-baseline design across participants was used (Barlow, Nock, & Hersen, 2009).

2.3.2. Baseline

No experimental variables were manipulated during this condition. The siblings and parents were instructed to continue their interactions with the adolescents exactly as they had done previously. They were told not to change any current interventions, including psychotropic medications and behavioral interventions that they had been using. Multiple baseline measures were taken for 3, 5, and 10 weeks for Mike, Chris, and Steve, respectively.

Prior to the intervention, the mother of each adolescent met with the senior author for a day during which they were taught the procedural steps of *Meditation on the Soles of the Feet* (Singh et al., 2003), and the steps for training their child with autism. The mothers were also instructed to practice the procedure themselves for a month prior to teaching it to their child.

2.3.3. Intervention

Following baseline, the adolescents were individually taught the mindfulness procedure by their mothers. Initial training was conducted during a daily 30-min training session for 5 consecutive days. During these sessions, the adolescents were seated comfortably in a soft chair, with their feet flat on the floor, and hands resting gently on their thighs. They were instructed to close their eyes to increase concentration and narrow their focus to the present moment. Then their mother provided the instructions in a calm and soft voice, taking them through the steps outlined in Table 1. This involved teaching the adolescents to shift their attention from the emotion (e.g., anger, fear, frustration) or other triggers that normally preceded the aggressive behavior to a neutral object—the soles of their feet. They were encouraged to practice the procedure at other times, at least twice a day, with the help of their mothers, as necessary. This practice did not require the presence of any trigger for their aggressive behavior, but they were encouraged to use the procedure especially when such a trigger to their aggressive behavior was present.

Once the adolescents had learned the basics of the *Meditation on the Soles of the Feet* procedure, they were given an audiotape of the instructions (recorded on their iPods) to use for self-practice. During the mindfulness training phase that

Table 1
Training steps for *Meditation on the Soles of the Feet* procedure.

1	If you are standing, stand in a natural rather than an aggressive posture, with the soles of your feet flat on the floor.
2	If you are sitting, sit comfortably with the soles of your feet flat on the floor.
3	Breathe naturally, and do nothing.
4	Cast your mind back to an incident that made you very angry. Stay with the anger.
5	You are feeling angry, and angry thoughts are flowing through your mind. Let them flow naturally, without restriction. Stay with the anger. Your body may show signs of anger (e.g., rapid breathing).
6	Now, shift all your attention fully to the soles of your feet.
7	Slowly, move your toes, feel your shoes covering your feet, feel the texture of your socks, the curve of your arch, and the heels of your feet against the back of your shoes. If you do not have shoes on, feel the floor or carpet with the soles of your feet.
8	Keep breathing naturally and focus on the soles of your feet until you feel calm.
9	Practice this mindfulness exercise until you can use it wherever you are and whenever an incident occurs that may otherwise lead to you being verbally or physically aggressive.
10	Remember that once you are calm, you can walk away from the incident or situation with a smile on your face because you controlled your anger. Alternatively, if you need to, you can respond to the incident or situation with a calm and clear mind without verbal threats or physical aggression.

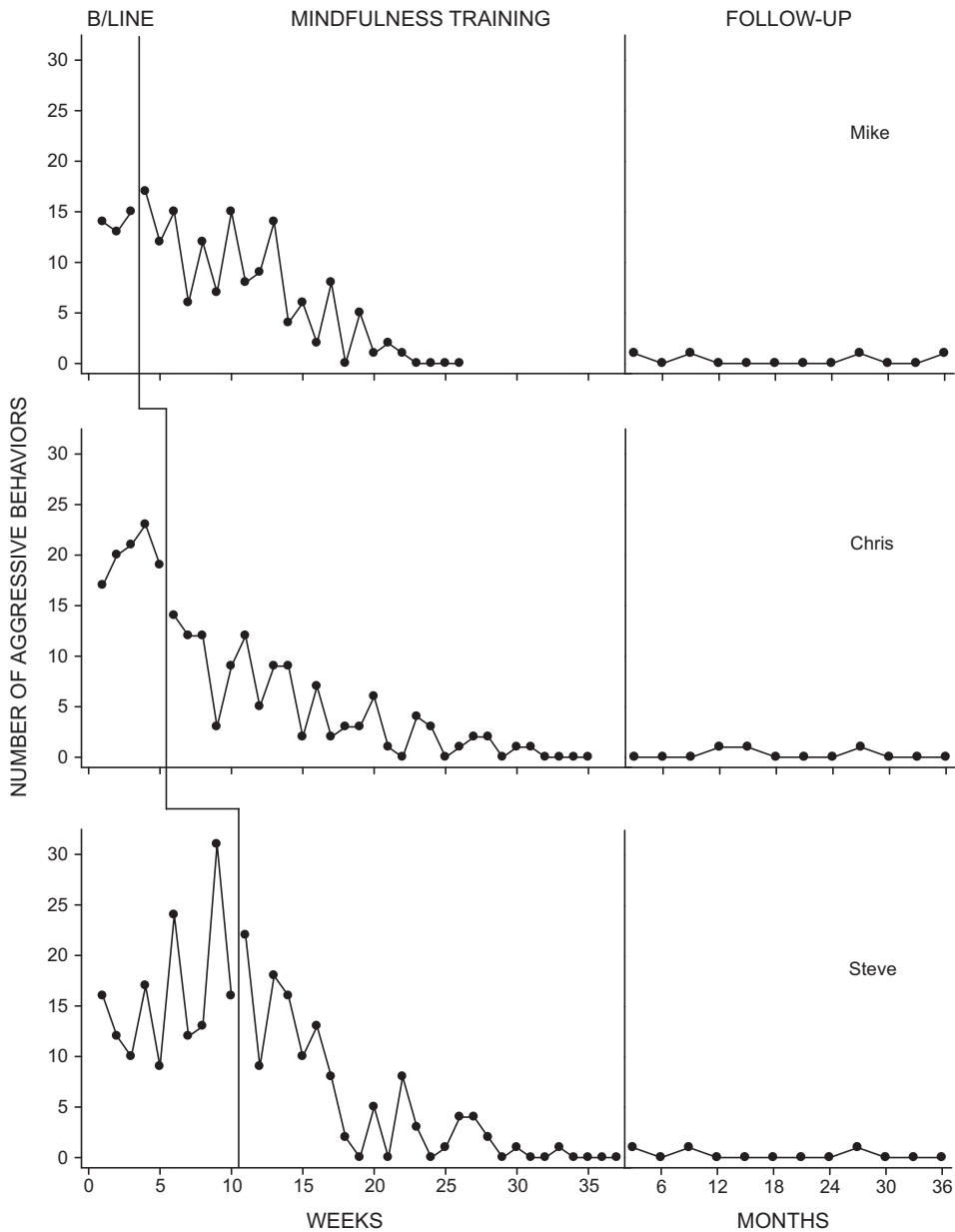


Fig. 1. Number of acts of physical aggression made by Mike, Chris, and Steve each week during baseline and mindfulness training, and during follow-up.

followed the week of intensive training by their mothers, each adolescent was required to practice the technique at least twice a day with their mother and to use it whenever an incident occurred that could elicit aggressive behavior. Formal training was terminated when each adolescent did not engage in aggressive behavior for four consecutive weeks.

2.3.4. Follow-up

Following termination of formal training, each adolescent was periodically reminded by his parents and siblings to continue practicing *Meditation on the Soles of the Feet* in an effort to maintain meditation stabilization, which is a state where the “mind engages the object of observation of its own accord” (Gyatso, 1999, p. 59). They were given no further instruction. Given our extensive experience teaching and using this procedure, we anticipated the participants would become so attuned to their environment and their interactions that the mere occurrence of an unpleasant situation with their parents or siblings would automatically evoke mindfulness, rather than aggression or some other maladaptive behavior. Follow-up data were collected for 3 years following termination of the intervention to assess maintenance of treatment gains.

3. Results

Fig. 1 presents baseline, mindfulness training, and follow-up data on physical aggression for each of the three adolescents. During baseline, Mike, Chris, and Steve exhibited an average of 14, 20, and 16 aggressive acts per week, respectively. During mindfulness training, their aggressive acts were reduced to an average of 6.3, 4.1, and 4.7 aggressive acts per week, respectively, with 0 during the last 4 weeks of intervention. During follow-up, Mike, Chris, and Steve engaged in 4, 3, and 3 aggressive acts in the 3-year period.

4. Discussion

We investigated the effectiveness of *Meditation on the Soles of the Feet* as a self-management strategy for physical aggression by three adolescents with autism. The three adolescents were able to learn and use this mindfulness procedure to manage their aggressive behavior towards parents and siblings. The multiple baseline design used in this study enables us to infer, with some degree of confidence, a causal relationship between the mindfulness procedure and the reduction in aggression. Introduction of mindfulness training with the first adolescent did not result in decreased aggression in the second and third adolescents and, similarly, introduction of mindfulness training with the second adolescent did not result in decreased aggression in the third adolescent. While the data show a clear and sustained decrease in aggression during mindfulness training, the changes over time were variable within and among the adolescents, and effective control of aggression took between 23 and 30 weeks to reach the criterion of no aggressive incidents for four consecutive weeks. However, once the adolescents achieved self-control of their aggression, they had only one or two aggressive incidents during each of the following 3 years.

This study adds to the mindfulness literature in general, and specifically to the self-management of aggression using SoF. In previous studies, we have shown SoF to be effective in assisting individuals with various disorders to control their aggression. In the original study, an adult with mild intellectual disabilities and mental illness learned to control his aggressive behavior, and maintain it in the community during a 1-year follow-up (Singh et al., 2003). In two studies, individuals with mild or moderate intellectual disabilities managed their verbal and/or physical aggression with SoF (Adkins, Singh, Winton, McKeegan, & Singh, 2010; Singh, Lancioni, Singh Joy, et al., 2007; Singh, Lancioni, Winton, Adkins, Singh, et al., 2007; Singh, Lancioni, Winton, Adkins, Wahler, et al., 2007). In one study, three adults with serious mental illnesses learned to control their physical and verbal aggression and maintain this throughout a 4-year follow-up after community placement (Singh, Lancioni, Singh Joy, et al., 2007; Singh, Lancioni, Winton, Adkins, Singh, et al., 2007; Singh, Lancioni, Winton, Adkins, Wahler, et al., 2007). In another study, three adolescents with conduct disorder learned to control their aggression at acceptable levels while at school (Singh, Lancioni, Singh Joy, et al., 2007; Singh, Lancioni, Winton, Adkins, Singh, et al., 2007; Singh, Lancioni, Winton, Adkins, Wahler, et al., 2007). Finally, six offenders with various Axis I disorders and mild intellectual disabilities learned to control their verbal and physical aggression in a forensic facility (Singh et al., 2008). The current study adds adolescents with autism to an increasing list of individuals with Axis I and Axis II disorders who have demonstrated self-control of aggression by using SoF.

This study has several strengths and limitations. In a translational study, Adkins et al. (2010) showed that a community-based therapist was able to teach SoF to three individuals with intellectual disabilities to control their verbal and physical aggression. In this study, we taught mothers of the adolescents the SoF procedure and they, in turn, were able to teach it to their children, as well as monitor their children's physical aggression. While this is a strength of the study, it may be a limitation as well. In earlier studies, we showed that when parents are taught mindfulness practices, there is a concomitant change in the behavior of their children—showing an increase in their adaptive behavior and a reduction in maladaptive behavior (e.g., Singh, Lancioni, et al., 2006; Singh, Winton, et al., 2006). In the present study, when we taught SoF to the three mothers, all reported changes in their own behaviors, such as being able to calm themselves by going to the soles of their feet whenever they experienced stress. Thus, it is likely that a change in mother's behavior may have had some impact on the adolescents' aggressive behavior. However, we think that this may not fully account for the extent of the behavior change demonstrated by the adolescents.

Another strength is that our study demonstrates that adolescents with autism are able to learn and utilize a mindfulness-based strategy for self-management. Virtually all of the extant research on the treatment of learned maladaptive behavior of individuals with autism has focused on behavioral or psychopharmacological interventions (Singh, Lancioni, Winton, & Singh, in press). While some of these interventions are effective in the short-term, they are all administered by external agents, often without the consent of the individuals with autism. Further, these techniques have not been found to generalize easily beyond the treatment setting, or be maintained without extensive programming. Thus, interventions such as mindfulness-based strategies, which enable the individuals to self-manage their behaviors, provide a positive alternative to traditional interventions. However, effective behavioral and psychopharmacological interventions typically produce behavior control reasonably rapidly, whereas mindfulness-based strategies take much longer, but once established, the mindfulness-based approach produces lasting behavioral change in lifestyle.

Another limitation of this study is that it is based on a very small sample. While strong internal validity was demonstrated with the use of a multiple baseline design across subjects, the findings will need to be replicated with larger samples, across the life span, and across the spectrum of maladaptive behaviors exhibited by individuals with autism, to fully establish mindfulness-based methods as viable alternatives to the standard behavioral and psychopharmacological treatments.

Undertaking group design studies, especially randomized controlled trials, would lend credence to its evidence-base. A further limitation of mindfulness-based interventions would be the cognitive status of the individuals. Like cognitive behavior therapy generally, there is an assumption that individuals (especially young children and individuals with intellectual disabilities or cognitive disorders) must function at a certain minimum cognitive level before they are able to fully benefit from mindfulness-based interventions. Future research could explore the lower limits of cognitive functioning required for mindfulness-based interventions.

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