Critical Review:
What is the effectiveness of prosocial training on the participation of children with Autism Spectrum Disorder?

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This critical review examines the effectiveness of prosocial training on the participation of children with autism spectrum disorder (ASD). Study designs include single-subject multiple baseline, mixed (between & within), systematic review and one informational article was used for background information within this paper. Overall, the evidence supports the use of prosocial training for increasing the participation of children with Autism Spectrum Disorders (ASD). Recommendations for future research and clinical implications are discussed.

Introduction

Deficit in functional language and social interaction are a defining characteristic of children with autism (Kanner, 1943). Unfortunately those deficits not only impede the child's development but also may lead to social withdrawal and isolation. Children who are socially withdrawn, in turn, may be rejected by peers (Ruban & Clark, 1983) and are consequently more likely to develop behavioral problems than their peers (Ollendick, Weist, Borden, & Greene, 1992).

In addition to social and communication deficits, students with ASD often display a host of other behaviors that can make learning in the classroom difficult. These behaviors include resistance to transition, sensory sensitivity, hyperactivity, short attention span, impulsivity, aggressiveness, and self-injurious behaviors (APA, 2000). Problem behavior is often the primary barrier to inclusion and social integration in the general education classroom.

The educational inclusion of students with autism and other disabilities has been a fiercely controversial topic (Harrower, 1999; Kauffmann & Hallahan, 1995). More recently there has been a trend to include students with autism and other disabilities in general education classrooms along with their typically developing peers (McDonnell, 1998). As early as the mid-1990's, researchers examined the outcomes of inclusion for students with ASDs and found that students with ASD who were included in general education classrooms showed increases in social engagement skills and had a larger circle of friends than did students in segregated settings (Fryxell & Kennedy, 1995; Hunt, Farron-Davis, Beckstead, Curtis, & Goetz, 1994). However, findings in this area have been mixed (Harrower & Dunlap, 2001). In some cases, limited or qualitatively poor social interactions have been reported in inclusive environments.

Research has demonstrated the effectiveness of different strategies for facilitating social interactions in elementary-age students with ASD. Rogers (2000) reviewed this area of literature and identified several effective techniques, including social stories, social skills groups, peer tutoring, pivotal response training, and visual cueing. The development of peer networks (Garrison-Harrell & Kamps, 1997; Kamps et al.,1997) and general peer training interventions (Gonzalez-Lopez & Kamps, 1997; Kohler et al., 1995; Lee &Odom, 1996; McGee, Almeida, Sulzer-Azaroff, & Feldman, 1992; Morrison, Kamps, Garcia, & Parker, 2001) have also been identified as valuable strategies that can support positive social outcomes.

Gray and Garand (1993) introduced the social story intervention as a method of teaching children with autism how to "read" social situations. Gray (1995) and others (e.g., Attwood, 1998) have proposed that this intervention is consistent with "theory of mind" (Baron-Cohen, 1995) accounts of autism, which suggest that individuals with autism have difficulty understanding that others have perspectives different from their own (Leslie, 1987).

Behavioral interventions for students with ASD have typically focused on three areas: preventative, supportive and corrective (Leach &

Duffy, 2009). The most effective way to reduce challenging behaviors and promote prosocial behaviors is through a function-based approach (Fox & Gable, 2004; Heckaman, Conroy, Fox, & Chait, 2000; Sasso, Conroy, Stichter, & Fox, 2001).

As it has been widely noted, autism is a highly heterogeneous disability with regard to level of functioning (G. Dunlap & Bunton-Pierce, 1999; Gillberg, 1999; Koegel, Valdez-Menchaca, Koegal, & Harrower, 2001). Thus, the level of intensity of supports required for a given student with autism will depend largely on the characteristics of the student's functioning. Educators must consider which intervention is most effective in reducing the problem behaviors typically associated with ASD and which intervention is most effective in promoting inclusion.

Objectives

The primary objective of this review is to critically evaluate existing literature on the effectiveness of prosocial training on the participation of children with ASD. The secondary objective of this paper is to propose evidence-based practice recommendations for future research and application in clinical practice in the area of prosocial training and participation of children with ASD.

Methods

Search Strategy

Computerized databases including Scholars Portal, Google Scholar and PubMed were searched using the following search terms: (autism spectrum disorder) OR (autism) OR (ASD) AND (prosocial) OR (participation) OR (inclusion) OR (promoting).
Reference lists of articles were manually searched for further studies relevant for the purpose of the critical review. In addition, relevant studies meeting the inclusion criteria referenced within acquired articles, specifically systematic reviews were included.

Selection Criteria

Studies selected for inclusion in this critical review were required to investigate the effectiveness of prosocial training on the participation of children with ASD. No limits were set on the type of intervention program, study design, outcome measures, dates of articles published or geographical location of research participants.

Data Collection

Results of this literature search yielded the following six articles that achieved the aforementioned selection criteria for inclusion in this review. These included the following study designs: single-subject multiple baseline [1], mixed (between & within) [2], systematic review [2], and an informational article [1].

Results

Leach & Duffy (2009) published an article that provided strategies and techniques related to social integration, as well as academic engagement, improved communication and enhanced positive behaviors. The strategies presented are organized by whether they are preventative, supportive, or corrective in nature. When preventative and supportive strategies are put into place, corrective strategies may not be necessary.

Preventative strategies are intended to limit ambiguity, so lessons flow smoothly: (a) social stories (Gray, 2003) (b) the use of the Picture Exchange System (Frost & Bondy, 1985), (c) the use of visual schedules, and (d) environmental arrangements (Kluth, 2003).

Supportive strategies are used to remind students of behavioral expectations before they engage in an activity: (a) set clear behavioral and social expectations for classroom routines (b) introduce the "big" idea of each lesson (Wiggins & McTighe, 1998), (c) use graphic organizers and guided notes (Lazurus, 1996), and (d) differentiate assessment (Anderson, 2007).

Corrective strategies are used when a negative situation has just occurred and the teacher needs to react or redirect. These strategies include a variety of differential reinforcement procedures, such as differential reinforcement of zero rates of behavior (i.e., display positive reinforcement when the student does not display challenging behavior for a certain time).

Active engagement in the environment is one of the main difficulties for students with ASD. In order to increase engagement, and thus minimize disruptive behaviors, it is important to provide a variety of instructional formats (e.g., whole-group instruction, peer teaching, etc), instructional lessons (e.g., physical participation, role-play, group response, special interests) and

use prompts (e.g., gestures, models, written text etc) in a prompt-fading style.

Harrower and Dunlap (2001) conducted a systematic review of the empirical research that has addressed procedures for promoting successful inclusion of students with autism. One of the contributing factors in the controversy over inclusion has been the limited number of studies that have focused directly on the procedures for facilitating educational inclusion (Hunt & Goetz, 1997).

Results from one study (Harris et al., 1990) failed to show significant differences in language ability between children with autism in segregated classrooms and those in inclusive classrooms. This finding has generally been interpreted as supporting educational inclusion, as segregated placements have historically been purported to provide more intensive educational opportunities for students with disabilities (Harrower, 1999).

Researchers have documented that students with disabilities, who are fully included: (a) display a higher level of engagement and social interaction, (b) give and receive higher levels of social support, (c) have larger friendship networks, and (d) have developmentally more advanced IEP goals than their counterparts in segregated placements. Authors note that the mere proximity to typical peers and the general education curriculum may be beneficial but in order for inclusive placements to be successful, educators must have knowledge of and access to empirically validated strategies that will assist them in this process.

Antecedent procedures have received high ratings of social validity. *Priming* is an antecedent procedure that allows a student to preview information or activities that they are likely to have difficulties with before they engage in that activity. Research has shown to be effective in increasing the initiations of social interactions with typical peers. Supplementing general instruction with various *prompting strategies*, delivered by either a peer buddy or a classroom teacher, have both yield increases in appropriate behaviors and independent transitioning. The prompt delivery by teacher-only has revealed superior results in increasing appropriate behaviors. The authors noted that *picture schedules* serve as effective cues for alerting students with autism to upcoming changes in activities.

Using *delayed or unpredictable contingencies* including unpredictable schedules of supervision, and delaying the delivery of corrective feedback were found to successfully maintain appropriate behaviors.Therefore, students with ASD may require less close supervisory attention.

Self-management strategies are documented as an effective strategy for increasing independent functioning, thus resulting in less one-on-one support. Documentation of the use of self-management intervention with students with ASD participating in inclusive classrooms have been scarce, however results include: (a) improving social skills, (b) reducing disruptive behaviors, (c) immediately increasing and maintaining independent work skills, and (d) improving social interactions in integrated academic settings.

Peer-mediated interventions have been documented as effective in facilitating the educational inclusion of children with autism and have been identified as having social validi*ty.* This type of intervention has the potential to reduce the need for continuous one-on-one adult attention, and therefore increasing autonomy and allowing students with ASD to function in a manner that more closely matches that of their typical classmates (Putnam, 1993). Specifically, *peer-tutoring* strategies have been shown to be effective in producing increases in on-task behaviors, math performance and social interactions. *Class-wide peer tutoring* in reading instruction has revealed gains in reading fluency and correct responses to reading comprehension questions. *Utilizing peer supports* by training non-disabled peers to interact with classmates with ASD has revealed increases in the frequency of interactions, number of opportunities for interactions, and overall appropriateness of the interactions with their peers with disabilities. Teaching social and academic skills to children with ASD and their non-handicapped peers in *cooperative learning groups* has resulted in increased frequency, duration, and quality of social interactions. As teacher assistance was gradually faded, non-disabled peers provided cues, prompts and consequences that assisted the students with disabilities in demonstrating targeted basic skills.

Multicomponent approaches using multiple research-based techniques are often more common in practice than single-component interventions. Multicomponent approaches have

demonstrated an increase in the frequency of initiations and amount of information provided by the student with ASD, resulting in interactions that closely approximate those between non-disabled students.

Pivotal response training (PRT) and naturalistic teaching strategies, appear to increase the motivation to learn by incorporating choices, reinforcing attempts, using adequate modeling and providing natural consequences. These approaches paired with peer-mediated strategies (i.e., peer tutors) have been documented as a multicomponent intervention strategy that resulted in children with ASD engaging in prolonged interactions, initiated play and conversations, and increased engagement in language and joint attention behaviors.

Pretask sequencing, preceding a difficult task with a series of short and easy tasks, has been typically found to be successful in increasing the appropriate responding to adult requests.

The systematic review provided analysis of the literature and identified many detailed intervention options, however, it failed to report how the data was analyzed, making it difficult to confirm appropriate statistical analysis. Conducting a meta-analysis or providing details about the method of and selection criteria may strengthen this review. This systematic review offered suggestive evidence that documented strategies could be individually tailored to meet the needs of students with ASD participating in inclusive educational placements.

Von der Embse, Brown and Fortain (2011) conducted a systematic review evaluating the literature of three major psychological and educational electronic research databases to identify best practices in reducing problem behaviours and promoting inclusions for students with ASD. To capture the most recent literature in this area since the passage of No Child Left Behind Act (NCLB, 2022), studies published in peer-reviewed journals within the past 10 years were included. A multi-step initial selection process, followed by a second set of inclusion criteria, was used to identify the studies in this review. Seven articles were included in this systematic review.

A limitation of the data in this article is that it only considers one way of measuring inclusion; the amount of time a student with ASD spends in the general classroom setting. Furthermore, there are few studies describing efforts that both reduce problem behavior and specifically measure inclusion as an outcome, making it difficult to reach conclusions about the best practices to facilitate inclusion. Additionally, of the few studies that did attempt to measure inclusion, these often relied on subjective teacher reports or hinted at the social aspects of inclusion without explicitly measuring anything. Four themes have emerged from this literature review. These 4 themes include: social skills training, behavioral approaches, tiered model of service, and functional behavioral assessment (FBA).

There has been much research regarding the effectiveness of various *social skills training*, however many social skills studies did not include both a reduction of the problem behavior and facilitation of inclusion. Social skills taught through games have been shown to demonstrate a decrease in inappropriate behaviors and generalization to new environments. Video modeling intervention resulted in increased positive social interactions and independent transitions.

Discrete trial training (DTT) is an example of a *behavioral approach* effective at both reducing problem behaviors and facilitating inclusion. Intensive drills are used to prompt a target behavior, and then a child is reinforced for displaying the appropriate behavior.

Tiered models of service delivery were found to be effective in promoting inclusion for students with ASD (Turnbull et al., 2002). This is a 3-level approach that is effective only at the group and the individual level. Problem behaviors were not reduced at the universal (school-wide supports for all children) level.

FBA is a method that identifies why a behavior occurs within a complex array of interacting variables by identifying the antecedent, the target behavior, and the consequence of the target behavior. Collecting data from an FBA is an effective method for identifying the function of behaviors to facilitate inclusion (Blair et al.,2007). “Contingency contracts” are a type of intervention that has been shown to be effective in reducing problem behaviors in students with ASD (Mruzek et al., 2007) and transitioning them into less restrictive environments (Jolivette & Wehby, 1999).

This systematic review provided a qualitative analysis of the limited studies that have

addressed problem behaviors as a means of facilitating inclusion for school-age students with ASD and identified many limitations. This review offered explicit indications regarding the lack of evidence-based practices that use inclusion as an independent measure. This study offers equivocal evidence of four common themes that are demonstrated to be effective in reducing problem behavior and promote inclusion of students with ASD in inclusive educational settings.

Delano and Snell (2006) used a multiple-probe-across-participants design to evaluate the effects of social stories on the social engagement of three students, ranging from 6 to 9 years old, with autism. Inclusion criteria, academic performance in the general education classroom environment, services received by each participant, and their level of communication skills were provided. Each target student was paired with a non-disabled peer for the intervention sessions, and paired with a second peer for generalization probes. The 6-typical peers that participated in this study were nominated and randomly assigned to serve as either a training or novel peer. The purpose was to examine the effects of social stories on the duration of appropriate social engagement and the frequency of specific social skills. Data were collected on the frequency of 4 social skills: seeking attention, initiating comments, initiating requests, and making a contingent response.

Prebaseline measures of each target student were recorded. This determined the particular story format to use for each student. The researchers used several procedures to examine the social validity of the treatment and of treatment effects. Assessment of the social acceptability of this intervention was obtained through peer brainstorming, individualizing social stories, and through teacher consultants. Data from a social comparison assessment were used to determine if intervention results approached the level of typically developing peers. This further increases the clinical fidelity of this study as the authors trained the social skill within an appropriate developmental range. Baseline sessions consisted of reading a generic story to the target child and training peer. A comprehension check was administered through asking the target child questions. When at least 75% of questions were correct, both children were instructed to go play for 10-minutes.

Intervention sessions were videotaped and data was collected on both duration and frequency measures. Comprehension check and play session were identical to baseline sessions. Once the first participant began intervention and met the first criterion, data was collected for the second participant as he started intervention. No data was collected on the third participant until the second participant met the first criteria. The time lag that was inserted between the starting points of each participant's intervention, accounted for possible environmental factors that may have occurred at one period of time. Periodically, convert probes were conducted to collect a sample of data immediately prior to an intervention session. A second criterion was established to determine when intervention could be faded. Exposure to the social story was reduced to every other day (Fade A). When criterion was maintained, the presentation of the social story was further reduced (Fade B), followed by a "no story" condition. Generalization probes were conducted for each target student at baseline, as well as each time a participant met the first or second criterion. The first author and a special education teacher who was not affiliated with the host school served as observers for the study. Inter-observer agreement (IAO) ranged from 74% to 96%. To assess treatment fidelity, a procedural checklist was completed for 1/3 of all intervention sessions, resulting in a range of 78% to 100%.

Results of the study were reported in a graph format and visual analysis revealed that in the baseline condition the participants spent a minimal amount of time engaged with their peers and demonstrated few target social skills. Following 15 sessions of intervention, two participants showed an increase over baseline in their duration of appropriate social engagement, however one participant demonstrated a variable data pattern in which 1 data point overlapped with baseline data. There was an accelerating trend in the frequency of target social skills, although one participant had substantial variation. As fading conditions continued and the social story intervention was completely withdrawn, data patterns of the duration of appropriate social engagement in two participants showed fluctuations. Conversely one participant showed a decreasing trend, yet all participants data remained above baseline. Following fading conditions, data on target social skills became decelerating and variable, yet remained above baseline measures for all participants. These outcomes were maintained in

their general education classroom setting for two participants at one to two week follow-up. Further, during a generalization probe, one participants' duration of appropriate social engagement exceeded the level of typically developing peers. Although all four targeted social skills were in the social stories, the students were found to use comments and make contingent responses most frequently.

This study adds to the growing body of literature evaluating the effects of visual support strategies on social communication of children with autism. Strengths of this study include the generalization of social skills outside of the controlled environment to the participant's classroom setting, social validity procedures, use of time lag between each participant's initial intervention session and a social comparison assessment.

The results of this study are suggestive; caution must be taken when interpreting the generalization outcomes for the following reasons: (1) a follow-up of only 1-2 weeks was completed; (2) generalization was only demonstrated for 2 out of 3 participants. This study lacked long-term follow-up to determine if treatment gains were maintained. Further, the sample size was relatively small (3 participants), thus it is impossible to show statistical significance and generalizability to the heterogeneous autism population. The clinical fidelity is debatable as there were some issues that prevented the researchers from evaluating social stories as the sole independent variable in this study. Two students were participating in DTT, and one student began using a behavioral contract midway through the investigation. These issues makes it impossible to determine if these students would have responded to the social story intervention in the same manner had they not been receiving additional support. A peer-mediated feature may have been added to this intervention, as the training peers in this study received the social story intervention with the student with autism, possibly training the peers to interact with the children with autism. Due to all participants sharing common characteristics, it is unclear if this intervention would be effective with children having fewer verbal and reading skills and a higher rate of inappropriate behavior. Finally, the length of the intervention phase was a limiting factor, as the trend and data paths were unstable for each child as fading began. This suggests that the criteria may have been inappropriate, and it may have been useful to continue the intervention phase for a longer period.

Owen-Deschryver, Carr, Cale, and Blakeley-Smith (2008) used a multiple-baseline-across-participants design to examine the impact of a peer training intervention on social interactions among students with ASD and their typical peers. Participants included two 7-year old boys with a diagnosis of autism and one 10-year old boy with a diagnosis of Asperger's Syndrome. The three participants showed significant social difficulties, as documented through consult, parent and teacher reports, however all participants differed in academic levels. Indirect social skill instruction may have occurred as school staff provided prompting and feedback in this area in order for these students to meet their IEP goals. Peers were chosen based on researcher observation in the classroom, recommendations from the classroom teacher, and based on a set of criteria. Sets of 2 to 4 typical peers were chosen to participate in the peer training intervention.

Pre-baseline data was collected over a 3-6 week period. Selected peers were removed from the classroom for three (30-45 minute) training sessions. The first phase provided the peers with a rationale for developing friendships with students with disabilities. The second phase consisted of a general discussion about the strengths and weaknesses of the classmate with ASD, followed by a third session consisting of discussions regarding concrete information and strategies that may be used when interacting with the student with ASD. Data was collected on the three participants, trained peers as well as on untrained peers. Clear definitions of the target measures, social initiations and responses to social initiations, were provided.

Both the peer group and the students with ASD showed an increase in their rate of responses. The mean rate of initiations increased for two of the three participants. Peer initiations increased for all three participants following peer training. Although the intervention did not target untrained peers, these peers also showed increased initiations towards the three students with ASD during the post intervention phase. According to the framework from the *International Classifications of Functioning, Heath and Disability* (ICF), disability involves dysfunctioning at one or more of these dynamic levels: structure and functions, activity limitations and participation restrictions. Owen-

DeSchryver and colleagues have validated that if the environment is changed, in this specific case through training typical peers on strategies to interact with students with ASD, then the individual's level of participation and activity can be positively impacted as a result.

A multiple baseline design across participants (evidence level 2) was appropriate for this study, as it minimized variations between individuals and within the same individual. Mean interobserver agreement was calculated; initiations 81%-83% and responses 81%-87%.

A limitation was that the participant selection was not explained, and there was selection bias in which participants were recommended by consultants from an agency. The process of selecting the varied sets of typical peers involved in intervention was non-standardized as well as altered during the intervention, which leads to non-reproducibility. The authors did not provide a rationale for choosing inconsistent combinations of gender and number of peers in each participant's set of trained peers. The experimental intervention was not independent of external variables, as this intervention was not conducted in a purely experimental environment. As a result of this pragmatic intervention, untrained peers also participated in the environment, thus the outcomes cannot be definitively attributed to solely the peer training intervention. Further, the sample size was relatively small, therefore it is impossible to show statistical significance and generalizability to the heterogeneous autism population.

The level of evidence offered by this study is suggestive. The selection bias and non-standardized grouping of participants reduce the clinical application of results.

Blair, Umbreit, Dunlap and Jung (2007) employed a single subject multiple base line across activities experimental design. The purpose was to investigate the usefulness of function-based intervention as a tool in supporting inclusive placements. The primary participant was a 6-year-old boy with a duel diagnosis of mental retardation and autism. The participant engaged in disruptive behaviors that included crying, vocalizing, screaming, laying down on the floor, jumping and hitting objects against the floor. In order to examine whether there were changes in peer interactions, a 5-year-old typically developing peer was selected because of frequent negative interactions with the primary participant. To examine any changes in the teacher's interactions, her behavior patterns were recorded.

The study was conducted in two phases. In phase one, data from a FBA were used to identify components of a function-based intervention that were tested directly with ongoing classroom activities. The FBA involved conducting a structured interview and standardized questionnaire with the participant's mother and ECE staff. A-B-C data collection was obtained through structured observations and clear definitions of the target behaviors were provided. Based on data from the FBA, hypotheses were developed and tested within the context of the typical classroom. In phase two, a multicomponent intervention was derived from the FBA and implemented over time in multiple classroom activities (music, center activities and circle time). The intervention consisted of modifying routines, replacement skill instruction, and effective ways to respond to challenging behaviors. The staff participated in training prior to implementing intervention. Intervention data was collected three times per week for a total of 13 weeks. Follow-up data were collected once per week for 6 additional weeks.

The authors reported the percentage of challenging behavior during experimental analysis in the form of a graph. Visual inspection of the data revealed that in phase one of the study, the lowest levels of challenging behaviors occurred when the primary participant took part in preferred activities, was in a smaller group, and received replacement skill instruction. The authors reported the percentage of replacement skills, and appropriate and challenging behavior during baseline and intervention in the form of a graph. The mean percentage of occurrences of challenging behaviors during baseline contained high levels (i.e., 87% during circle time) and low levels of challenging behaviors during intervention (i.e., 21% during circle time). During baseline, no replacement skills were observed, however the mean percentage of intervals for replacement skill use during intervention was increased from baseline and maintained in the follow-up period. Furthermore, appropriate behavior increased during intervention. Positive interactions by both a peer and teacher, across all activities, were reported to have much higher levels during intervention. These positive interactions continued during the follow-up phase.

Blair and colleagues defined and described the methodology and experimental control in detail allowing for replication and analysis. A social validity questionnaire that was completed by ECE staff resulted in an average rating of 4.5 (out of 5), which indicated strong support for the intervention. This measure is viewed as a strength of this study and of critical clinical importance as introducing a social skills intervention into the general education classroom will require the support of the teacher. IOA was reported to be between 87-100%. Treatment integrity data were collected to assess the degree to which intervention components were implemented with integrity (range= 92% - 96%). Observers used a rating scale (0-low, 1, 2-high) to assess a 10-item checklist which resulted in a rating of 1.7 for both the ESE teacher and the classroom aide.

A limitation was that the analysis was limited to one individual in a single classroom. This hinders the reliability of the authors' conclusions. Generalization remains a concern because there were characteristics of the classroom that are not present in every context. A social comparison assessment was not conducted, therefore the extent to which the participant's level of appropriate behavior matched the levels of his classroom peers is unknown. Additionally, the vast majority of research in this area has occurred in the United States, however this study took place in South Korea. This raises concern about the possibility of cultural influences and the potential impact of different policies and concerns.

The results of this study are compelling as a function-based intervention resulted in decreased levels of challenging behavior and increased levels of appropriate behavior. However, caution must be taken in interpreting generalization due to the limitation in the research design, as this investigation was limited to only one participant.

Discussion

The purpose of this review was to examine the effects of prosocial training on the participation of children with ASD. Overall, the critical appraisal of relevant research material suggests prosocial training may be effective for increasing the participation of children with ASD in inclusive classroom settings.

While all of the reviewed studies provided a positive outcome of prosocial training on the participation of children with ASD, there were limitations within studies. The authors noted that research on the definition and measurement of inclusion is lacking on the many complexities involved beyond one's physical presence in a general education classroom. It is important for researchers to consider participation, acceptance, and achievement when reporting on inclusion of students with ASD.

Future research would be beneficial to provide additional information to better answer the research question posed in this paper. In order to improve the level of evidence provided by the existed literature, it is recommended that future research take the following into consideration:

1. Studies should consider increasing the sample sizes, such that results will have more statistical power and be more generalizable, and thus be applied to clinical practice

2. Future research should employ more rigorous study designs that offer more reliable evidence

3. Greater experimental control to evaluate a specific type of intervention as the sole independent variable, without additional treatment or reinforcement

4. Create, test and validate a prosocial intervention tool kit to be provided to educators and school boards in order to increase uptake of the prosocial intervention

Conclusion and Clinical Implications

As social interactions are a core deficit of ASD there is a tremendous need to identify quality, evidence-based practices that are clinically plausible for facilitating participation of children with ASD within inclusive settings. Despite limitations in the research examined in this review, positive outcomes on the participation of children with ASD were reported in all of the studies presented. Results suggest that prosocial training could be beneficial in increasing participation of children with ASD, and provide some justification for using prosocial interventions in a clinical setting. However, it is vital that clinicians be cognizant of the shortcomings of the current research, particularly when applying the intervention to a diverse population. While the preliminary results of

these interventions indicate some beneficial outcomes for children with ASD, more rigorous and controlled replication of these findings in future research studies has the potential to yield significantly more compelling evidence that prosocial training could be an effective intervention for increasing participation of children with ASD.

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