Using Communication to Reduce Challenging Behaviors in Individuals with Autism Spectrum Disorders and Intellectual Disability

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KEYWORDS

• Autism Spectrum Disorder • Intellectual Disability • Communication • Behavior • Intervention

KEY POINTS

- Individuals with Autism Spectrum Disorder/Intellectual Disability (ASD/ID) are at risk for challenging behaviors that can result from an inability to satisfy their needs through effective communication.
- Communicative impairments in ASD/ID are related to joint attention and the theory of mind difficulties and characterized by profound pragmatic deficits, poor expressive language, and a paucity of communication initiations.
- Evidence-based interventions, such as Functional Communication Training, Interpretive Strategies, the Picture Exchange Communication System and Augmentative and Alternative Communication, and Pivotal Response Training, can support increased communication and decrease challenging behavior.
- It is concluded that an effective communication system will address one or more of the communication deficits of ASD/ID, must be personalized and conducted using a genuine attitude of respect for the individual, and should be effective immediately upon its introduction even if the ultimate goal is to progress to a more sophisticated symbolic system.

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INTRODUCTION

Challenging behaviors are a frequent concern for individuals with Autism Spectrum Disorder (ASD) who may or may not have a concomitant intellectual disability (ID). Common challenging behaviors that occur across the lifespan include self-stimulation and stereotypy, self-injury, noncompliance, physical aggression, and other destructive or disruptive behaviors.[1,2] Without appropriate intervention, challenging behaviors tend to persist in individuals with ASD/ID and related developmental disabilities,[2,3] leading to exclusion from education-based and community-based services (and social participation more generally) which, in turn, serves to further limit opportunities for learning and development.[2,4,5] As such, the presence of challenging behaviors has clear implications for treatment planning and the training of parents and professionals who provide services to individuals with ASD/ID.

Crucially, individuals with ASD/ID may use challenging behaviors as a form of expressive communication,[6–8] which is reinforced by the finding that individuals with ASD/ID with higher language skills tend to evidence less frequent and less severe behavioral challenges and interventions that focus on establishing effective communication strategies show reductions in a variety of disruptive behaviors.[9,10] The purpose of this article is to describe the importance of engaging the individual with ASD/ID in a process of communicative development for addressing challenging behaviors. This process is necessary so that the individual "may come to experience, firsthand, the power of communication as an effective tool for satisfying needs and expressing thoughts and feelings."[11(p208)] To support effective communication, and ultimately promote more adaptive behaviors, it is instructive to review the communicative challenges characteristic of ASD/ID first that are relevant for the present purposes.

COMMUNICATION CHALLENGES IN ASD/ID

One difficulty in describing communicative challenges in ASD involves the individual differences in cognitive and linguistic abilities. Some individuals evidence severe cognitive impairments and extremely limited receptive language abilities and are functionally nonverbal. Others outperform neurotypical individuals on verbal and nonverbal tests of intelligence and have precocious vocabularies. Even when language form and content seem to be intact, however, individuals with ASD/ID experience considerable difficulty understanding and using language to express themselves appropriately for the purposes of social communication. Thus, deficits in the pragmatic domain are particularly emblematic of the disorder.[11]

The pragmatic deficits characteristic of autism are partly explained by deficits in receptive language. It is noteworthy that neurotypical children evidence stronger receptive relative to expressive language skills and this pattern has been observed from the earliest stages of development,[12] which makes sense because "language comprehension must always occur ahead of production, as children cannot functionally use words which they do not understand."[13(p682)] Therefore, evidence that receptive skills are impaired relative to expressive skills in ASD[13–15] has important implications for those working to improve adaptive functioning. First, it follows that expressive language strengths can be recruited to improve communication (as in the teaching of appropriate verbal output). Perhaps more importantly, however, it suggests that comprehension can be promoted to scaffold expressive language further while addressing a foundational aspect of language impairment.[13]

Of course, expressive language deficits also occur in ASD/ID particularly in the area of initiation. Although conversational initiation is clearly deficient, not all aspects of initiation are. For example, "a child who hits others or leaves an activity to indicate

that he or she wants to be finished with it is initiating even though the behavior is undesirable."[11(p214)] The implication is that effective strategies for using communication to remediate challenging behaviors must provide a way for the individual to initiate communicative exchanges in conventional, or at least transparent, ways.[11]

The pragmatic deficits of ASD/ID are primarily rooted in the developmental events that precede language acquisition and which constitute the basis of pragmatic communication ability. These developmental events include deficits in joint attention[16] and "theory of mind"[17] as well as an inability to integrate and derive meaning from diverse pieces of information in context.[18] That is, typically developing children engage in episodes of joint attention whereby they share attention to an object while monitoring their interactional partner's affect and engagement.[19] They develop a "theory of mind" so as to understand others' mental states, attitudes, and intentional stances. Not only do they instinctively read social cues encoded in the paralinguistic features of language (eg, tone of voice, intonation, and stress patterns), interpret facial expressions and nonverbal gestures, and make inferences about the inner mental worlds of others, but they also relate these cues to the physical and social environment to extract meaningful information and acquire social and cultural knowledge. As discussed more fully later in this article, compensatory strategies to support the sociocultural learning that is acquired by typically developing children through episodes of language-mediated and context-bound joint interactions can be potent for addressing challenging behaviors.

Before leaving the topic of communicative impairments in ASD/ID, it is important to note that communication deficits are related to more general challenges in the ability to process transient stimuli, shift attention, and filter irrelevant information. Accordingly, many popular intervention strategies to support communication and behavior make use of visual supports, capitalizing on this area of relative strength for persons with ASD/ID. Visual supports have been used in a range of contexts to facilitate a variety of communicative interactions, build vocabulary, and help the individual organize his or her thinking. Indeed, visual supports have the potential to lessen cognitive load and enhance understanding and research has demonstrated reductions in challenging behaviors when visual elements are incorporated into treatment plans.[20]

EPIDEMIOLOGY OF CHALLENGING BEHAVIOR IN ASD/ID

"Challenging behaviors" is a term used to describe a heterogeneous set of problem behaviors that vary in their nature, frequency, and severity. Some have characterized challenging behaviors as more demanding or less demanding[21] to reflect this variation but most researchers refer to a relatively uniform set of behaviors that are included under this term. As noted previously, these are self-stimulation and stereotypy, self-injury, noncompliance, physical aggression, and other destructive or disruptive behaviors.

Recent prevalence estimates of challenging behaviors in individuals with ASD/ID range from 35.8% to 64.3% with most studies reporting that more than half of these individuals engage in more than one challenging behavior.[4,5,22,23] Not surprisingly, the severity of challenging behaviors is related to both ASD[24] and ID severity[4,25] and the rates for individuals with ASD and ASD/ID are substantially higher than individuals diagnosed with ID alone (ie, 10%–15%).[21]

USING COMMUNICATION TO ADDRESS BEHAVIORAL CHALLENGES

Several strategies for using communication to remediate the core deficits of ASD/ID have been developed. This article reviews the 4 following intervention categories:

1. Functional communication training (FCT)

2. Interpretive strategies
3. The picture exchange communication system (PECS) and augmentative and alternative communication (AAC)
4. Pivotal response training (PRT)

These approaches differ in their procedures and theoretical focus (and sometimes the targeted population) and, although not all were developed specifically for the purpose of addressing challenging behaviors, all have received an impressive degree of empiric support for this purpose.

Functional Communication Training

At its most basic level, communication is an active effort to affect one's environment. It is "the power to make adaptations and/or bring about change in the human condition."[11(p207)] Carr and Durand[6] were the first to document predictable relationships between environmental circumstances and challenging behaviors. They showed that low levels of adult attention and high levels of task difficulty were associated with misbehavior and that when children were taught to solicit attention and assistance verbally through FCT, problem behaviors were suppressed. The results of this study confirmed the idea that many behavior problems can be viewed as a nonverbal means of communication and that problem behaviors may serve a variety of functions. FCT is designed for anyone who displays challenging behaviors. Nonverbal individuals or those with limited language are taught to communicate using AAC strategies. In this approach, the child's expressive language skills are recruited and the child is trained to initiate communication using carefully selected communicative phrases (or signs or AAC) to replace problem behaviors that presumably serve the same function.

To understand the functions behind a challenging behavior, researchers and service-providers often conduct a Functional Behavior Analysis (FBA). FBA grew out of work in Applied Behavior Analysis and is a process to determine the relationship between events in a person's environment and the occurrence of a challenging behavior so as to develop appropriate intervention strategies.[26,27] Although a variety of functions have been identified in the literature, these are typically collapsed into 1 of 4 primary functions that sometimes go by slightly different names. One scheme uses the terms *Attention* (the goal is to receive attention from others), *Objects and Activities* (the goal is to gain access to a desired object or activity), *Escape/Avoid* (the goal is to escape or avoid something that is perceived as aversive), and *Automatic Reinforcement* (a behavior occurs because it feels good, alleviates pain, or is otherwise internally reinforcing).[8] A variety of FBA procedures have been developed to assess behavioral functions including interviews with persons who are familiar with the child, record review, child observation, and more structured functional analyses.[28] Behavior checklists are completed during some period of observation to examine antecedent events, behavioral responses, and environmental consequences (eg, the Antecedent-Behavior-Consequence checklist,[29] the Motivation Assessment Scale).[30] Generally speaking, FBA has proven to be a valuable tool in the development of treatment plans to address challenging behaviors and research has demonstrated that the use of FBA is associated with improved treatment outcomes.[31]

Interpretive Strategies

People communicate primarily for the purposes of joint attention; to bring another person's focus of attention in alignment with one's own for the purpose of sharing an experience. As noted previously, a deficit in communicating for joint attention is a hallmark impairment of ASD[32] that restricts access to social information and cultural

learning. Misperception of social events leads to anxiety, which, in turn, may manifest as "aggressive or oppositional behavior…tantrums, rage, and 'meltdowns'."[33(p123)] Thus, Interpretive Strategies that facilitate communication to give individuals with ASD/ID access to relevant social information are theoretically potent for addressing challenging behaviors.

A variety of Interpretive Strategies have been developed that vary in the nature and degree of structure they provide and the extent to which they invite or require active participation. Interpretive Strategies are adult-mediated activities that make use of visual supports (eg, photos, icons, words, stick drawings, worksheets) to structure a conversation. They can be used after an unsuccessful behavior or situation or before an anticipated challenging situation. Interpretive Strategies are not punishments; they are supportive and constructive and they use a patient and positive tone.[33,34] The purpose of Interpretive Strategies is to help the individual with ASD/ID understand social situations and develop problem-solving skills by reviewing behavioral and social issues using a structured visual format.

Well-liked Interpretive Strategies include (but are by no means limited to) Social Skills Autopsies,[35] the Situation, Options, Consequences, Choices, Strategies, Simulation (SOCCSS),[36] and a subcategory of interventions known as story-based interventions. The most popular story-based interventions are Social Stories[37] and Comic Strip Conversations.[38] Each strategy is summarized in **Table 1**.

The PECS and AAC Strategies

PECS[39] is an aided picture/icon-based augmentative system designed to teach communicative initiations for a variety of communicative functions (eg, requesting objects, answering questions, commenting). PECS is designed for individuals who are nonverbal or who have the limited language abilities to "address fundamental and pivotal communication problems, namely, the failure to initiate communication."[40(p258)] By contrast, the more general class of AAC strategies should be considered for anyone with ASD/ID[41] to support expression and comprehension. Of course, given the tremendous individual differences in ASD/ID, AAC interventions should always be tailored to the individual's communicative needs.[42]

Table 1
Interpretive strategies for supporting social communication

Interpretive Strategy	Description
Social autopsies[35]	Following a social mistake, the individual completes a worksheet with an adult to identify the mistake, determine who was harmed and how to correct the mistake, and develop a plan to prevent the mistake in the future.
SOCCSS[36]	Following a social problem, the individual completes a worksheet with an adult to identify the situation (ie, who, what, when, where, and why), brainstorm alternative behavior options, identify the consequences of each, prioritize these options, develop a plan to carry out the option, and practice the behavior.
Story-based intervention[37,38]	Personalized stories are constructed for or with the individual to give the individual direct access to social information with the idea that advances in social cognition should be accompanied by more appropriate behaviors. Story-based interventions need not focus on problem behaviors and affirmative stories that celebrate social success and offer praise are encouraged.

A few popular AAC strategies take the form of simple visual supports that communicate choices, expectations for behaviors, or directives. These strategies are known to most practitioners and include things like contingency maps (essentially if/then statements), scripts (eg, "How to brush my teeth"), and the First/Then strategy. These strategies may be effective in managing behavior because they make use of simple and readily understood visuals to communicate basic information. On the other hand, they are not designed to support or encourage reciprocal communication and initiation, which does not mean that these strategies are undesirable last resorts. To the contrary, there are simply situations whereby these pragmatic options need to be available. It does mean that these strategies occupy a lower rung on the symbolic hierarchy. Although this may make them advantageous for certain individuals or situations, they must be used in the context of a more comprehensive approach that aims to build a communication system in which the individual can *initiate* communication in adaptive ways.

PRT

Communication requires a degree of motivation that individuals with ASD/ID often lack. PRT[43] focuses on increasing motivation by incorporating child choice, turn-taking, and direct and natural reinforcers that are directly related to the task. Maintenance tasks are also interspersed with novel tasks to ensure the individual experiences success and enjoyment during communicative exchanges. Originally designed to promote language development through the use of behavioral principles, the idea is to target pivotal behaviors such as motivation and communication initiations that lead to large collateral changes in untargeted areas of functioning. Individuals who respond well to PRT tend to have an interest in toys and low to moderate levels of nonverbal stereotypy and moderate to high rates of verbal stereotypy.[44]

Clinical Vignette: Communication Strategies To Address Challenging Behaviors

When we met 8-year-old "Kevin" (pseudonym), he had been diagnosed with autism and had low-average language skills according to formal testing. Our intervention with Kevin focused on the challenging behavior of pinching. As a first step in developing the intervention, we engaged in an information-gathering process that included child observation and an in-depth interview with Kevin's mother. We also engaged Kevin in a series of Comic Strip Conversations[39] to explore the causes and consequences of the pinching behavior from his perspective.

Through maternal interview, child observation, and our own structured conversations with Kevin, we learned a great deal about the purposes behind and contexts surrounding his pinching behavior. Kevin pinched family members and children and adults at school when he was excited, bored, anxious, or angry. As such, pinching seemed to fall into the category of Automatic Reinforcer with the behavior related to sensory sensitivities and self-dysregulation. Pinching was a daily occurrence and, although Kevin had been told on several occasions that pinching was not acceptable, the pinching had persisted and increased in frequency. Kevin was aware and saddened by the fact that his pinching was often painful to others but reported that he was simply unable to stop.

Based on the information gathered, we developed a Social Story[34,37] to communicate to Kevin what was happening during these pinching events. Care was taken to ensure that the language level was appropriate and that the words chosen would be meaningful and accurate. Visual supports in the form of BoardMaker symbols were added to take advantage of the visual processing strengths characteristic of ASD. Kevin's Social Story is presented in the Appendix to this article.

Data for a 4-week baseline (A) and 6-week Social Story intervention phase (B) are presented in **Fig. 1**. *Subjective data in the form of behavior ratings and maternal daily diaries were*

collected across AB phases of study. Kevin's mother was asked to rate Kevin's ability to resist pinching across settings on a scale of 1 to 10 (higher values indicating more positive outcomes).

Data from this pre-experimental design reveal that maternal subjective ratings of positive behaviors increased from 4.0 during baseline to 8.2 during intervention with many days with no pinching during intervention. Several of the mother's reports support the rating data and suggest qualitative shifts in Kevin's understanding of, and ability to engage in discussions about, pinching. For example, one report read, "No pinching all day. He began to ask questions about when he first started pinching. We talked about other behaviors that he used to have (biting, scratching, pushing) that he's learned not to do. Kevin agrees that the [social] story is very true to what he does and how he feels." Other comments during this period revealed how Kevin was using strategies provided in the Social Story, including, "He did not pinch me today. Instead he buried his face into my chest and began to squeeze me. He wanted to pinch me during homework this evening…but he snapped instead (on his own, no prompt!)."

Intervention using Social Stories was immediately effective and although pinching was not totally eliminated during intervention (see **Fig. 1***), Kevin's mother was nevertheless enthusiastic about the therapeutic changes she had seen in Kevin's behavior and understanding. This is exemplified in her comment that, "If you would have told me a year ago that we would be able to go a full day without pinching I would have said that was crazy. We have many days now of no pinching at all!"*

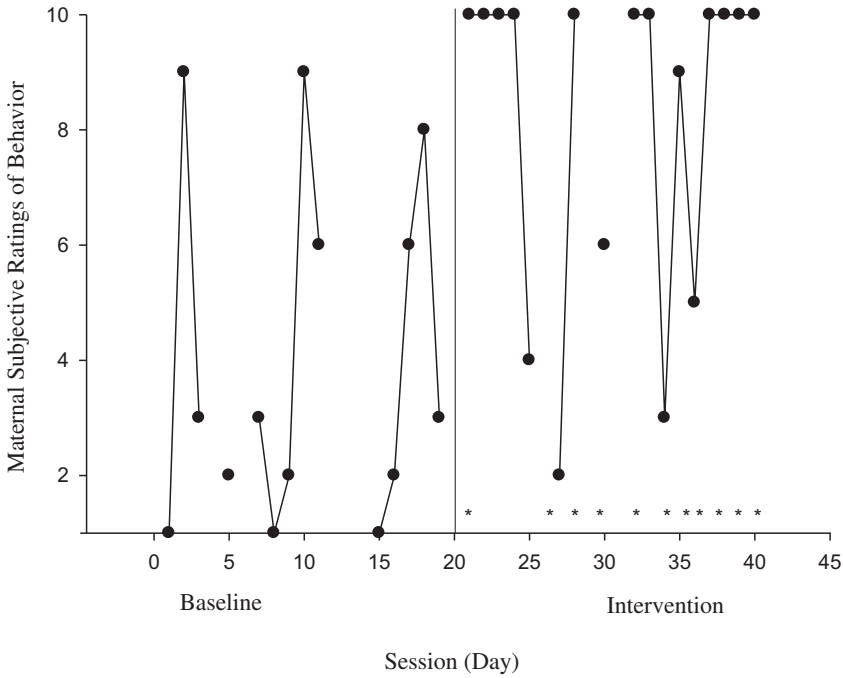

Fig. 1. Maternal subjective ratings of pinching behavior for A (baseline) and B (intervention) phases using a 10-point scale with higher values indicating less problematic behavior. Asterisks indicate the days on which the Social Story was read.

This example highlights some important considerations for using communication to address challenging behaviors. First, it illustrates the use of an Interpretive Strategy for creating meaning-making in socially and culturally relevant ways. Second, it underscores the importance of the information-gathering process and the assemblage of meaningful and accurate information.[34] Third, this example illustrates the importance of adopting an attitude of genuine respect for the individual; one that recognizes the unique perspective of the individual and uses this as a framework to developing a personalized treatment plan.[11] Finally, Kevin's story reminds us of the power of communication and social learning for facilitating introspection and analysis to support more optimal outcomes. Indeed, this mother's reports (and similar reports from parents reported elsewhere[45,46]) support the notion that Interpretive Strategies like Social Stories and Comic Strip Conversations can assist the individual in thinking through challenging situations and problem behaviors to help them make more adaptive behavioral decisions.

REVIEW OF CURRENT EVIDENCE

The interventions described in this article were selected by their strong empiric support. All of the interventions (with a few exceptions noted below for specific treatment strategies within the broader intervention class) have been identified by the National Standards Project[47] as established treatments for ASD. Established treatments are those for which a high level of evidence is available and abundant. In short, they are interventions for which several well-controlled studies have been shown to produce beneficial effects, although, to our knowledge, only Social Stories[48] and PECS[49] have been the subject of randomized controlled trials.

FCT

There are nearly 200 studies, including several reviews, with evidence to support positive outcomes for individuals with ASD/ID and related disorders when using FCT to address challenging behavior.[50–54] FCT meets the criteria for being considered a well-established treatment across a range of challenging behaviors.[51,53,55–58] There are some potential unwanted effects, however, when using FCT. Namely, overuse of the newly trained response or return of the unwanted behavior is possible if reinforcement is delayed or insufficient to meet the original communicative need.[50]

Interpretive Strategies

With regard to Interpretive Strategies, Social Skills Autopsies[35] and SOCCSS[36] have not been evaluated adequately with reports of their effectiveness coming mainly from practitioners.[33] As noted above, Social Stories have been rigorously evaluated and story-based interventions have been identified as 1 of 11 established treatments in ASD/ID by the National Standards Project.[47] They have been found to be effective for addressing a wide range of problem behaviors in school and home settings,[3,46] including disruptive behaviors,[59] tantrums,[46] aggression,[60] and self-injurious acts.[61] It should be noted that tremendous variability in effect size within and across studies has been observed with scant evidence with regard to which participant characteristics predict success.[63,64] Some evidence is accumulating, however, that the concreteness of the target and the clarity with which stories can be written is one predictor of success.[31,62] Although originally intended for individuals with high functioning ASD,[37] more recent evidence confirms that Social Stories and Comic Strip Conversations can be used successfully for individuals who are nonverbal and have the most severe challenges.[60,62,64]

PECS and AAC

Research investigating both PECs and AAC demonstrates effectiveness in supporting the communication of children with ASD who have limited or no functional communication. Much of the efficacy research for PECS reports positive outcomes for increasing verbalizations and social initiations as well as decreasing problem behaviors.[65–69] Researchers have investigated the impact of PECS on the ability to exchange pictures, use words spontaneously,[70,71] make requests,[72,73] and decrease inappropriate behaviors.[69] Not all results, however, are consistently observed for all study participants, highlighting the importance of recognizing and addressing individual variation and needs.

The use of AAC with individuals with ASD has a growing body of evidence,[74] although it is often not immediately considered for individuals with ASD/ID because of fears that speech development will be hindered.[41,75] Millar and coworkers[76] reported, however, that AAC is an effective strategy for decreasing challenging behavior without limiting the development of speech in individuals with ASD and related disorders.

PRT

PRT has strong evidence for supporting parent education and facilitating social communication. Children with ASD have been taught to imitate words that, generalized across settings,[77] improve their speech intelligibility,[78] decrease their tantrums and physical aggression,[20,78,79] and increase their social communication.[80,81]

DISCUSSION

In a vital sense, there is no distinction between communication and behavior. The act of communication itself is behavioral and all observed behaviors, whether they are intended as communicative, have message value. Herein lies a major challenge (and source of anxiety) for individuals with ASD/ID who lack recognition, not only of this relationship between communication and behavior,[82] but also of the power of communicative behaviors for shared meaning-making, cultural learning, and satisfying needs more generally.

This article considered several strategies for using communication to address challenging behaviors in ASD/ID. Each approach targeted one or more of the communication impairments characteristic of ASD/ID, which contribute to deficits in the pragmatic domain. Whichever strategy is used, the authors agree with Twatchman[11] that a genuine attitude of respect for the individual and his/her perspective must be adopted. There are misunderstandings between people and what is called challenging behaviors that makes perfect sense when viewed by the person with autism. In short, an attitude of respect and nonjudgment helps toward understanding the reasons behind maladaptive behaviors so that they may be addressed effectively and with the most careful consideration.

With the exception of a few AAC strategies, all of the reviewed approaches are designed to support communication initiation; this is critically important because initiation provides a means for affecting one's environment and satisfying needs. As described previously, communication strategies—even those that do not support reciprocity and initiation—can be effective for some purposes; however, the authors strongly suggest that they be viewed as one tool in a larger communication system that supports the ability to initiate communication in more conventional ways. At the same time, the communication system should be effective at reducing challenging behaviors from the moment of its introduction even if the ultimate goal is to progress to a

more sophisticated symbolic system,[11] which also does not mean that a focus on the foundational processes of joint attention and shared meaning-making cannot be emphasized. In fact, strategies like joint attention training can be beneficial for all individuals with ASD/ID and may be particularly important for those with the most limited language skills.[83] Of course, creating opportunities for joint attention and promoting a child's functional language understanding is likely to be a more challenging and less immediately rewarding task for the interventionist. Nevertheless, "such an approach will focus on addressing the child's fundamental, rather than the more outwardly observable, aspects of a language impairment."[13(p688)]

SUMMARY AND FUTURE DIRECTIONS

The literature is promising in the area of communication intervention to address challenging behaviors in individuals with ASD/ID. The interventions described in this article are evidence-based and highly feasible for addressing behavioral challenges across settings. The empiric research, however, usually involves children, with little investigation of adult populations—a much-needed area of research foci. In a related vein, interventions with individuals with ASD/ID are not uniformly effective. Thus, an important direction for research involves identifying the participant, context, and intervention variables that predict success with communicative strategies to address challenging behaviors. It will also be important to continue the investigation of interventions that specifically address the challenging behaviors that are common in individuals with ASD/ID while capturing the critical role that communication or the lack of communication plays.

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APPENDIX

Kevin's Social Story

What to do when I want to pinch?

My name is Kevin.
I am 9 years old and I go to [name of school].
I know lots of people at home and at school.
Sometimes when I am at home or school or somewhere else, I might pinch someone.
Sometimes I pinch because it makes me feel relaxed, like when I snuggle with my Mom.
Sometimes I pinch when I get excited, like when I goof around with [stepsister] and [dog's name] or wrestle with [stepfather].
Other times, I pinch when I am bored and tired of waiting.
When I pinch, this can make others think, "Hmmm, that's strange." "I wasn't expecting that." "I wonder why Kevin pinched me."
They might also think, "Ouch! That hurts!" or "I wish he wouldn't do that."
I have worked hard with [interventionist] to learn how to stop pinching.
When I want to pinch at home, I can talk to my mom about it.
I can also hug my mom or squeeze her hand.
I might also do a thumb-war or a hand massage to help me stop pinching.
When I want to pinch at school, I can snap my fingers.
I can also tell [school SLP's name] that I feel like pinching and she can try to help me to stop.
I am still learning how not to pinch and that is ok.
It makes my Mom happy when I do things that help me stop pinching.