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Observational learning by individuals with autism: A review of teaching strategies

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Abstract

Observational learning is the process used to explain the acquisition of novel behaviors or performance of previously acquired behaviors under novel conditions after observing the behavior of another person and the consequences that follow the behavior. Many learners with autism do not attend to environmental stimuli at a level sufficient to learn a range of prosocial behaviors through observation of others. Modeling, group or dyadic instruction, and explicit observation training can improve the extent to which individuals with autism learn through observation. This article reviews previous research that involved observational learning by individuals with autism and outlines future research that could benefit instructional practices.

Keywords

autism, group instruction, modeling, observational learning

Introduction

Learning through the observation of others is one mechanism by which humans acquire novel behaviors or learn to perform previously acquired behaviors in novel situations (Bandura and Walters, 1963; Miller and Dollard, 1941). It is now widely accepted that typically developing children acquire many skills through observation of others (Bandura, 1977; Catania, 1998; Deguchi, 1984; Greer et al., 2006; Masia and Chase, 1997). However, individuals with autism are characterized by a severe deficit in attentiveness to surroundings (Lovaas and Smith, 1989; Thurm et al., 2007) and therefore may not be as likely to learn skills by observing the behavior of others. This deficit places individuals with autism at a distinct disadvantage when attempting to keep pace educationally, socially, or functionally with their same-aged peers.

Instead of learning within larger group contexts in a manner similar to typically developing peers, individuals with autism often require direct instruction delivered in a one-to-one teacher to student ratio (Stahmer, 2007). This method of service delivery does not align well with current financial constraints faced by many public school districts wherein ratios require a single teacher or teaching assistant deliver instruction to a minimum of three to five students with autism at one time. Procedures that promote learning through observation of others within group contexts are therefore critical for students with autism. The purpose of this review is to define and describe observational learning, examine characteristics of students with autism spectrum disorder (ASD) that may contribute to difficulties in observational learning, and discuss strategies that may facilitate learning through observation for individuals with autism. Finally, future research needs related to observational learning interventions for individuals with autism will be discussed.

Observational learning

Observational learning has been defined as a change in behavior that occurs as a function of observing the behavior of others and the consequences for those behaviors (Catania, 1998). Common characteristics of observational learning include the observation of behavior and consequences for those behaviors, a matching or similar response performed by the observer, and the observer coming into contact with an intermittent schedule of direct consequences that are similar to observed consequences (Bandura, 1977; Greer et al., 2006; Masia and Chase, 1997; Miller and Dollard, 1941). Observational learning terms with definitions and

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Table 1. Terminology for observational learning.

Term	Definition	Example
Observational learning	Change in behavior that occurs as a result of observing the behavior of others and the consequences of those behaviors	Young child demonstrates increased use of the word please when asking mom for cookies after observing an older sibling say "can I please have a cookie?" and receive a cookie
Matched-dependent responding	Behavior that immediately follows and matches the behavior of a model and is dependent on an observer seeing the behavior and the consequences of behavior for a model	An older brother hears his father's footsteps coming to the door at the end of the day and runs to the door to greet his father, who playfully throws the boy up into the air to greet him. The younger brother observes this interaction but did not run to the door, as he did not hear the footsteps. The next day, the younger brother follows his older brother in running to the door despite not hearing the footsteps
Vicarious consequences	Environmental events that follow modeled behavior and cause an increase or decrease in a similar behavior by an observer	Delivering praise to children who are sitting quietly waiting for instruction leads to an increase in the number of children sitting quietly in the classroom
Response suppression	An immediate decrease in behavior that occurs after observing punishing consequences delivered to a model who performed a similar behavior	A driver decreases speed on the highway after observing several police cars pulling over other fast moving vehicles
Formal similarity	The observer's response matches the physical characteristics of the model's response	A child claps his hands two times after observing an adult clapping her hands two times and saying "do this" to the child

examples essential to the current review are outlined in Table 1.

Observational learning has a long history in behavioral (Miller and Dollard, 1941) and cognitive (Bandura, 1965) psychology. Past and current analyses emphasize the functional control of observed consequences over the observer's behavior (Bandura, 1977; Greer et al., 2006; Miller and Dollard, 1941). The observed consequence is therefore a key feature of observational learning that differentiates this phenomenon from imitation, which is another class of matched responding described in the following section (Bandura, 1977; Miller and Dollard, 1941).

Observational learning and imitation

From a behavioral perspective, imitation involves observation of a modeled response and a matching response emitted by the observer immediately following the modeled behavior (Cooper et al., 2007). Imitative behavior is strengthened by direct consequences and not through observation of consequences delivered to a model. That is, a child imitates others because of a previous history of direct reinforcement for matching the behavior of a model. Children with autism often demonstrate deficits in imitative behavior (Smith and Bryson, 1994), and this is typically one of the first instructional programs targeted in early intervention programs for those children (Taylor and DeQuinzio, 2012). Despite the acquisition of an imitative repertoire following explicit instruction, individuals with autism do not necessarily acquire an observational learning repertoire (Taylor and DeQuinzio, 2012).

Observational learning requires several skills in addition to the ability to imitate. Behavior that can be attributed to observational learning is presumed to be under the primary control of the observed consequence, which signals the availability of a similar form of direct reinforcement should the child engage in matching behavior (Masia and Chase, 1997). After learning to imitate, individuals must be able to discriminate between conditions where another person receives a favorable versus no or unfavorable consequence following a specific behavior (Taylor and DeQuinzio, 2012). Once a child has acquired an observational learning repertoire, he can learn the relation between a particular class of behaviors and the consequences that are likely to occur should the child perform the response under environmental conditions similar to those observed. This distinction is important for instructional purposes where it is possible to teach children skills by ensuring that they observe the behavior of others and the consequences for those behaviors.

A final important distinction between observational learning and imitation is that the former could include response suppression that occurs as a result of observing punishing consequences delivered to a model following a behavior of interest. Early experiments demonstrated the effects of observed punishment on children's suppression of aggressive behavior (Bandura, 1965; Bandura and Walters, 1963). These experiments show that observers

Table 2. Features of imitation and observational learning.

Feature	Imitation	Observational learning
Observing antecedent events	A	A
Observing behavior of others	A	A
Observing consequences for those behaviors		A
Student performs observed behavior immediately following the model	A	S
Target behavior has formal similarity to modeled behavior	A	S
Behavior is strengthened by direct consequences	A	S
Target behavior is topographically different though functionally equivalent to model		S
Behavior is under primary control of observed consequence		A
Behavior is under primary control of previous history of reinforcement for matching a model	A	
Behavior can be suppressed if observed consequences are punishing		S

"A" indicates that the feature is *always* a component of the concept; "S" indicates that the feature is *sometimes*, though does not always need to be a component of the concept; and blank space indicates that the feature is *never* a component of the concept.

who see nonpreferred consequences following a modeled behavior can learn not to match the behavior of a model (i.e. response suppression). Conversely, imitation only includes those instances where matched responding occurs. Table 2 provides an overview of similarities and differences between observational learning and imitation.

Observational learning and autism

Skills associated with observational learning including attending to surroundings, imitation, discrimination, sequencing steps in a task, and initiating interactions with others are all noted deficit areas associated with individuals with autism (Hume et al., 2012; Nikopoulos and Keenan, 2003; Taylor and DeQuinzio, 2012). In addition to these deficits, individuals with autism are characterized by restricted interests (Spiker et al., 2012), which may narrow the pool of observed consequences that would function as reinforcers for the individual. Despite these obstacles, developing an observational learning repertoire is an essential component of a successful education. It is not practical to expect that a child will acquire all the skills necessary for postsecondary success through explicit one-to-one instruction.

Although not often discussed as a prerequisite, the ability to learn through observation of others may also play an important role in the successful inclusive education of individuals with autism (Perreira and Greer, 2009). In fact, a common argument in favor of inclusive education is that an individual with autism has numerous models from whom they can learn important skills (Charlop-Christy et al., 2000). However, if the learner is not able to attend to pertinent details of both the model and the environment, placement within an inclusive setting is likely insufficient to promote observational learning. It may be necessary to gradually teach the target student to learn through observation prior to expecting that the student will learn new skills by observing peers within an inclusive setting.

Several studies examining observational learning in the 1970s and 1980s identified the potential to use observed reinforcement strategies to efficiently teach language, social skills, academics, and appropriate behavior to individuals with disabilities (Drabman and Lahey, 1974; Goldstein and Mousetis, 1989; Kazdin, 1973; MacDonald et al., 1986; Strain et al., 1976). Despite the positive outcomes of early observational learning research in education for students with disabilities, a relatively small number of studies have been conducted to examine the observational learning repertoires of children with autism (Greer et al., 2006). Additionally, the majority of research in this area has examined how children can learn specific skills through observation of others' behavior and the consequences for those behaviors; observational learning in these cases is an independent variable. Very few research studies exist that examine the acquisition of an observational learning repertoire, that is, observational learning as a dependent variable. This is an important distinction as children with autism may need to acquire an observational learning repertoire and then use that repertoire to acquire specific skills.

Given the potential importance of observational learning, an improved understanding of how children with autism can learn to learn through observation of others seems to be an important step for future research. In order to begin understanding this process, it may be helpful to first analyze previous research that has examined the acquisition of skills through observational learning or the acquisition of observational learning. Such a review may support intervention researchers in the development of strategies that can further promote the acquisition of skills through observation of others for children with autism.

Teaching skills to students with autism through observation

A nonsystematic review of the literature, intended to provide a sampling of relevant research related to observational

Table 3. Strategies for promoting observational learning in students with autism.

Strategy	Description	Sample reference
Live modeling	The target student observes a peer or adult model demonstrate a specific behavior then engages in a similar response. Modeled event MUST include specific antecedent stimuli that is likely to induce target behavior and a consequence that is associated with the antecedent stimuli and target behavior	Charlop et al. (1983)
Video modeling	The target student observes a video display to show a model (adult, peer, or self) engaging in a behavior under specific environmental conditions. After the video, the student is provided with an opportunity to perform the modeled response	Plavnick and Ferreri (2011)
Group and dyadic instruction	The target student observes the peer behavior and consequences for the behavior during group instruction. Then, the target student serves as a model for another student in the group. The role of target student and observer shift throughout the group instruction	Tekin-Iftar and Birkan (2010)
Explicit instruction in the observation of others	The target student is explicitly taught to observe the behavior of others and the consequences of those behaviors in order to learn how to perform a similar response under similar conditions	Bock (2007a)

learning and its application to students with autism, was conducted. Search terms associated with autism and observational learning were entered into the Education Resources Information Center (ERIC) and PsycINFO® databases. A sample of articles involving individuals with autism as participants in experiments wherein observational learning was the independent or dependent variable was found. From this sample, articles were selected that illustrated a variety of observational strategies (e.g. modeling, dyadic or group instruction, explicit instruction), targeted skills across a number of domains (e.g. academic, social, language, life skills), provided instruction in diverse settings (e.g. general and special education classrooms, clinic), and included participants both with and without ASD (e.g. peer confederates).

Several instructional procedures that involve observational learning and individuals with autism were identified. Modeling, dyadic or group instruction, and explicit instruction in observation of others are procedures described in the research literature that involve observational learning by individuals with autism. Table 3 provides a brief overview with exemplars of previous research for each of the observational learning instructional methods.

Modeling

Modeling is an evidence-based teaching procedure for individuals with autism (National Standards Project (NSP); National Autism Center, 2009) that involves a target student first observing a peer or adult model demonstrate a specific behavior and then engaging in a similar response (Cooper et al., 2007). When used to teach novel behavior to individuals with autism, modeling often involves a premeditated situation whereby a model is used to show a learner how to perform a particular behavior under a specific set of circumstances. To classify modeling as observational learning, the modeled event must include specific antecedent stimuli that reliably evoke a particular response (i.e. the target behavior) and a consequence that is associated with the antecedent stimuli and target behavior. The critical feature is the observed consequence as it is the defining feature of learning that takes place via observation (Greer et al., 2006). For example, a teacher could teach hand-raising behavior by creating a situation wherein a child with autism is instructed to observe a peer raising his hand, waiting for the teacher to call his name, asking for a snack, and then receiving the requested snack. The child with autism could then be given an opportunity to emit the same response (i.e. hand raising and requesting food) followed by the same consequence.

As an observational learning approach, modeling has been used to teach skills such as language, play, vocational behavior, academics, and social interaction to individuals with autism (Matson et al., 2007). Most research involving modeling has placed an emphasis on recruiting peer confederates to perform a planned behavior under certain environmental conditions while a teacher instructs the learner to watch the model (Blew et al., 1985; Carr and Darcy, 1990; Charlop et al., 1983; Charlop and Walsh, 1986). Charlop et al. (1983) trained individuals with autism to receptively identify objects and then recruited those individuals as models for participants, also diagnosed with autism. Participants learned to receptively identify the objects after observing peer models demonstrate correct identification and receive edibles and praise for accurate responding. Participants learned to identify objects faster when modeling versus trial and error teaching was used and also demonstrated higher levels of generalization and maintenance during the modeling condition. Numerous replications and extensions provide overwhelming support for the effectiveness of peer modeling as an observational learning procedure for individuals with autism (see NSP; National Autism Center, 2009).

Despite the many positive aspects of modeling as an observational learning strategy, there may be several barriers to using modeling in many instructional settings for individuals with autism. Conditions for modeling may be difficult to arrange due to the demands it places on the model's time and the need to train the model to perform the response in a consistent and precise manner (Gena et al., 2005). Additionally, as individuals with autism demonstrate inattentiveness to surroundings (Lovaas and Smith, 1989; Thurm et al., 2007), a student may not attend to the relevant details of the environment, behavior, or consequences that would support acquisition of the target response.

Video modeling. Recent advances in technology may mitigate barriers that prevent the use of modeling within instructional settings. Video modeling is an observational learning procedure that utilizes a video display to show a model (adult, peer, or the learner herself) engaging in a behavior under specific environmental conditions (Bellini and Akullian, 2007). At some point following the video display, the learner is provided with either an explicit or incidental opportunity to perform the modeled response. Video modeling has been very effective for teaching skills such as social initiations, reciprocal play, vocational behavior, communication, and academics to individuals with autism (Bellini and Akullian, 2007).

Video modeling has several features that are not possible with in vivo modeling (Charlop-Christy et al., 2000). For example, once a video is created, the learner can observe the same behavior under the same circumstances several times without occupying a model for an extended period of time. This can facilitate easier recruitment of models and removes the potential for variation that may occur during repeated in vivo presentations. Video modeling can also enhance the extent with which instructors accurately deliver the intervention as the video model provides the primary source of information to the learner. Finally, video clips can be used with multiple learners, which can drastically increase the overall efficiency after the initial video is created.

Similar to live modeling tactics, video modeling procedures may or may not include observed consequences that are explicitly manipulated to promote acquisition of the response for the observer. Plavnick and Ferreri (2011) actively manipulated observed consequences within a video modeling intervention to show that previously nonvocal children with autism acquired vocal requests when, and only when, the observed consequence was a known reinforcer. Video modeling interventions that do not incorporate observed consequences would be more similar to generalized imitation training and would not constitute an observational learning intervention.

Multistudent instruction

Dyadic and group instruction involves the delivery of instruction to more than one individual at a time. It is the primary method by which instruction is delivered to typically developing students within public school settings, which makes the ability to learn in multistudent contexts an important skill for individuals with autism. Observational learning occurs in multistudent instruction when each student in the instructional arrangement learns skills targeted for another student(s) in the arrangement through observation of peer behavior and consequences for the behavior (e.g. Ledford et al., 2008). This is slightly different than modeling as all students have opportunities to learn through observation in multistudent instruction; the role of target student and observer shifts from one student to another during the course of instruction. Thus, each student within the multistudent grouping may learn skills targeted for himself as well as his peers. Teaching procedures must be carefully programmed to ensure that observational learning occurs for students with autism during multistudent instruction (Greer et al., 2006).

Reading skills (Ledford et al., 2008; Rehfeldt et al., 2003), social skills (Kroeger et al., 2007), and meal preparation (Tekin-Iftar and Birkan, 2010) have been targeted by researchers examining observational learning of individuals with autism within a multistudent context. In contrast to the more commonly described one-to-one teacher to learner ratio for individuals with autism, multistudent instruction offers a more practical approach in public educational settings where resources do not typically allow a one-to-one ratio (Stahmer, 2007).

A primary benefit of group instruction is the potential to deliver highly efficient instruction. Rehfeldt et al. (2003) employed group instructional tactics to teach sight words to individuals with autism and other developmental disabilities. The experimenters prompted participants to watch one another during instructional trials, provided praise for attending to the model (i.e. target learner), and praised the model for correct sight word responses; thus, each participant observed the delivery of positive feedback to the model when another learner received explicit instruction. In addition to learning their own targeted sight words, the three participants learned sight words targeted for peers through observation of the instructional sessions. This investigation showed that students with autism could learn academic skills through observation of others, which is a critical skill for success within inclusive educational environments.

Ledford et al. (2008) examined the effects of a dyadic teaching strategy on observational learning of early elementary-aged students (i.e. K-2) with autism. Dyadic strategies are similar to modeling in that a peer serves as a model for the target learner. However, dyadic strategies can be differentiated from modeling as both participants receive explicit instruction in target skills. This creates a situation whereby

the role of "model" and "observer" rotates back and forth as one partner in a dyad receives instruction while the other partner observes and then vice versa. Ledford et al. instructed both students in a dyadic instructional arrangement to "look" at a flashcard as one student called the word. Correct responses were followed by praise and a token that could later be traded in for a terminal reinforcer for the target student; the observer received no explicit feedback. Future probe sessions revealed that five of the six participants acquired sight words for which they had observed instruction delivered to peers but had received no explicit instruction. The results support the findings of Rehfeldt et al. (2003) that multiparticipant instructional arrangements are not only effective but can also be very efficient for learners with autism.

Tekin-Iftar and Birkan (2010) used group-based observational tactics to teach food and drink preparation to three elementary-aged students with autism. Participants were instructed to observe their peer, who received direct instruction to prepare a preferred snack or drink. Observers were praised for attending to the instructional sequence, and all participants sampled the snack or drink once it was completed. In addition to learning to prepare their targeted snacks or drinks, participants learned to prepare the snacks and drinks targeted for their peers with 100% accuracy. This strategy demonstrated the efficiency of embedding observational learning within a group instructional format as each participant was explicitly taught three behavior chains for snack or drink preparation yet mastered a total of nine behavior chains for snack or drink preparation.

The primary challenge of promoting observational learning within a group instructional format is to determine whether the complex procedures can be implemented within common public school settings where the majority of individuals with autism receive educational services. Research examining observational learning within a group context has either been delivered by private providers in home settings (Rehfeldt et al., 2003), graduate students conducting research projects (Ledford et al., 2008), or within the context of research training centers where service providers receive intensive training in the delivery of the interventions (Tekin-Iftar and Birkan, 2010). Group instruction often requires fast-paced instruction to ensure multiple learning opportunities for each participant, contingencies to ensure participants observe one another, simultaneous data collection for multiple students, and often the implementation of behavioral programs that inhibit interfering behavior (e.g. disruptive vocalizations, motor stereotypy, off-task, out of seat). In some cases, educational service providers may need specific training in each of these areas (i.e. explicit fast-paced instruction, data collection, and behavior management) in order to administer effective group instruction.

Explicit instruction in observation of others

A final approach to teaching students with autism to learn through observation is to explicitly teach the learner to observe the behavior of others and the consequences of those behaviors in noncontrived settings in order to learn how he should respond to a wide range of stimuli. The ability to learn in this manner represents the generalization of observational learning and has received little attention in previous research (Greer et al., 2006).

Bock (2007a, 2007b) successfully used a social–behavioral learning strategy entitled "Stop–Observe–Deliberate–Act" (SODA) to teach learners with Asperger's syndrome how to participate in novel social interactions. The SODA strategy teaches a learner to stop and privately ask himself questions about who, where, and what he should observe after encountering a novel social situation. The learner is then taught to explicitly observe the nature of the social interaction including qualities pertaining to formality, length of conversational turns, and topics of conversation before joining the social context. The learner asks himself a series of private questions pertaining to how he can be involved in the social situation in a manner that is similar to his social peers. Finally, the learner acts by joining the social situation and carrying forward the plan he conceived during previous steps.

Pereira and Greer (2009) taught two children with autism to monitor academic behavior of peers in order to acquire novel academic skills within instructional settings. Participants were required to signal whether a peer emitted a correct or incorrect response after observing the teacher deliver reading and spelling instruction to the peer. An instructional unit consisted of the presentation of the target word, the peer response, and teacher feedback. After explicit observational training in peer monitoring, participants demonstrated the acquisition of novel academic skills such as picture labeling when instruction was delivered to a novel peer. Importantly, the experimenters delivered positive reinforcement to participants for correct monitoring responses but did not provide reinforcement or error correction for responding to academic probes. Thus, the behavior that was targeted and reinforced was observational learning rather than specific academic targets.

The investigations by Bock (2007a, 2007b) and Pereira and Greer (2009) demonstrate the importance of teaching observational learning as a target behavior. Although similar to procedures that use observational learning to teach specific target skills, these investigations are exemplary in that they specifically target a skill that is believed to be essential for students with autism in inclusive settings.

Current state of observational learning research with individuals with autism

When a distinction is drawn between observational learning as an instructional approach (e.g. modeling) and as a target behavior (e.g. teaching peer monitoring), there is very little research documenting methods for teaching observational learning to individuals with autism. The absence of research in this area is likely a result of

challenges associated with research design. Specifically, accurate measurement and demonstrations of experimental control over observational learning repertoires require a number of explicit research tactics that may be difficult to program into natural environments.

In order to show that an individual acquires the ability to learn new skills by observing the behavior of others and the consequences for those behaviors, an experimenter must first demonstrate that an observational learning repertoire does not exist prior to intervention (Greer et al., 2006). Because the majority of research with individuals with autism involves observational learning as an independent variable (i.e. the teaching method as in modeling), the baseline conditions typically demonstrate the pre-intervention levels of the specific target behavior (e.g. social initiations, object identification, vocational task) as opposed to levels of observational learning. No clear conclusions about the acquisition of an observational learning repertoire can be obtained from such studies.

Although Bock (2007a, 2007b) explicitly taught students with autism to observe peers, the baseline conditions did not involve an examination of observational capacities prior to the intervention. Thus, the only valid conclusion that can be drawn is that the observational training sequence led to the acquisition of targeted social behavior (e.g. playing games or visiting with peers during lunch). The only known intervention to specifically demonstrate the acquisition of observational learning repertoires for individuals with autism was the peer monitoring response used by Pereira and Greer (2009). The latter investigation provides important pilot data demonstrating how an observational learning repertoire may be assessed prior to, during, and following an intervention designed to teach such a skill. However, this study was limited to two participants with autism, which makes it difficult to draw clear conclusions about the relation between the intervention and the acquisition of observational learning. Future research that clearly measures observational learning as a behavior and controls for threats to internal validity is needed to better understand how individuals with autism can learn to learn through observation.

Directions for future research

Research examining strategies that promote observational learning repertoires, as opposed to simply demonstrating the acquisition of various skills through interventions that involve observation, is a critical area for future research. One strategy that merits investigation is multiple-exemplar modeling instruction whereby an individual with autism is taught to observe the behavior and consequences for multiple models under a variety of conditions to determine whether such training leads to the generalization of an observational learning repertoire. That is, would the participant learn to spontaneously observe others in natural settings after being explicitly taught to observe a range of models? This type of intervention could be carried out using live or video models, though video models ease the burden if repeated viewings are necessary, which could occur for some individuals with autism.

A second area for future research would be to examine the impact of group-based instruction on observational learning repertoires for learners with autism. There is a great deal of empirical support for the feasibility and benefit of small-group instruction for individuals with autism (Kamps et al., 1992; Leafet al., 2010; McDonnell et al., 2006). The majority of this research examines the acquisition of targeted skills for each participant when instruction is delivered within a group as opposed to one-to-one context. However, a second potential benefit of small-group instruction is that participants may be able to learn skills targeted for other participants, in addition to their own targets. Despite the potential of this procedure for efficient instruction, there are relatively few empirical examinations of the benefits of group instruction for learning through observation of instruction delivered to peers (e.g. Rehfeldt et al., 2003). Future research that leads to the development of explicit, and perhaps manualized, procedures could aid educational service providers in the delivery of effective group instruction for learners with autism.

A third important area for future research is the implementation of observational learning interventions (e.g. modeling) by public educational service providers. The majority of observational learning interventions in previous research have been implemented in private educational settings by highly trained personnel (e.g. Rehfeldt et al., 2003) or by researchers (e.g. Plavnick and Ferreri, 2011). Although public schools provide many opportunities for modeling (live or video) and group instruction, complex procedures may limit the extent to which educational service providers implement observational learning interventions (Rosenberg et al., 2010). Service providers may need explicit training to (a) develop modeling procedures with observed consequences, (b) utilize video-based technology, or (c) effectively teach individuals with autism to observe peer models.

Finally, the present review provides a description of a sample of the literature on interventions that promote observational learning among children with autism. It does not systematically review the literature or quantitatively evaluate empirical outcomes. Future research that systematically reviews the intervention literature and employs standards to discriminate high-quality research (e.g. Kratochwill et al., 2010) may help evaluate experimental analyses of intervention outcomes. A meta-analysis with effect-size estimation could help researchers and practitioners predict which observational learning strategies are likely to be most effective for individuals with autism. Such a review could also assess whether there are sufficient studies to identify evidence-based practices that promote observational learning as a dependent variable (e.g. Pereira and Greer, 2009).

Conclusion

Many interventions that use observational learning have been effective for teaching a variety of specific skills to individuals with autism. These interventions suggest that individuals with autism can learn new skills by observing the behavior of others and the consequences for that behavior. This is important research as it suggests the potential for individuals with autism to learn through observation within inclusive educational settings. However, this research is limited in that it does not provide necessary information regarding methods for teaching individuals with autism to learn through observation of others in natural environments.

A generalized observational learning repertoire, or the ability to learn via observation of others within natural environments, is a critical skill to teach individuals with autism. As the number of students diagnosed with autism in public school settings increases, the importance of teaching this group of learners to acquire new skills via observation becomes a high priority for educational service providers. In order to meet this demand, researchers need to provide empirical demonstrations of replicable teaching procedures that promote the acquisition of observational learning repertoires for individuals with autism.

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