Expansion Activities

The Main Event

The topic for Volume 4, Issue 5, is Introducing Yourself. Our guest editor is Aileen Collucci. She has written The Main Event and has provided some terrific tips on introducing yourself.

Some ideas to teach and practice introduction skills include:
1. Ask students to role play the following:
   • Introducing yourself to an adult
   • Introducing yourself to a someone your own age
   • Introducing yourself to a group of kids who are just hanging out (you might want to have the students view the following on www.videojug.com: How to Network at Parties)

2. Discuss what should be said after the introduction:
   Play a video from the TV program The Big Bang Theory (“Sexy Penny and the Geeks”; http://www.youtube.com/watch?v=mDhMoohB2oA). In this clip, Sheldon and Leonard are getting to know their new neighbor, Penny. Have students identify the parts of the introductions that worked and those that did not.
   • Ask students to rewrite the introductions so that they work better.

3. Talk about introducing a person to a third party. Show a video from the 1960s (“Exchanging Greetings and Introductions”; http://www.youtube.com/watch?v=6UvTcElWVg8). Play a brief segment of the video; then stop it and ask how things have changed since the 1960s and how they have stayed the same. There are seven segments that can be used for introductions. Groups of students can each view a portion of the video and provide an update to the class, or the segments can be used as a whole-group activity.

NOTE: Many schools do not allow access to Youtube. You can, however, use a free program at home to convert Youtube videos to a format that can be used on your school computer. The program is called Ixconverter (http://www.ixconverter.net). There is even a Youtube video that shows you how to use Ixconverter (http://www.youtube.com/watch?v=IJ4_EqEJnuE)!
Departments

I Second That Emotion!

This scale addresses the very confusing issue of “reading” other people. It is recommended that you find photos of different facial expressions as well as body language that might fit into each level on the scale. Video modeling is an excellent strategy to use when using this scale. Have your students video tape each other portraying each level.

Coming to Our Senses:

The topic in this issue is getting in sync; it was submitted by Heather Pugh. Some activities include:
1. Have students complete the worksheet below.
2. Have students role play some of the scenarios in the worksheet.
3. Ask students to draw a cartoon of someone who has a negative experience and how he reacts. Students can also search online for a cartoon, look through books of cartoons, or search through daily comic strips in newspapers.
4. Have students make a 5-point scale for themselves about their emotions.

Gets-It Knows!

This is a good letter to read as an introduction to a discussion about individualism. It is important to differentiate “inappropriate” from “individualism,” but be careful not to be too judgmental when talking about what you think of as “inappropriate.” Point out to students that being unique or different does not equal being wrong!

Puzzle Time:

Use the puzzles as a supplemental activity to reinforce the topic lesson. The answers are posted on this website. You can expand on the use of the puzzles by listing the key words on the board and asking your group what they learned about the words.

Tip to Combat Bullying:

1. Brainstorm with students what you can do if you see a person being bullied.
2. Role play how to support a person who has been or is being bullied.

Animal Facts:

Throughout the magazine, fun facts involving animal behavior are interspersed. We hope this will increase the entertainment quotient of the overall magazine experience.
Something to Talk About:

This is a true story. Research indicates that sharing true stories about social dilemmas can actually help a person to understand such situations better. When reviewing this article with your students, try to think of a similar story that you can recall from your own childhood or a friend’s life. This is an interesting story about an interesting situation. Can your students relate to how Winston was feeling about his favorite seat? Winston says that he loved that seat. Have any of your students felt that strongly about an object?

The Cartoon:

Note: The abstract nature of the cartoon is purposeful. Social rules and social faux pas are subtle and this activity gives students an opportunity to analyze the social information, point by point.

It is expected that the teacher or group leader will support this using the following prompt questions:

• What is funny or interesting about this cartoon?
• The joke seems to lie in the words the boy uses to describe the baby.
### A Worksheet on Being In Sync

Check the things that are like you and brainstorm what to do.

<table>
<thead>
<tr>
<th>HOW YOU FEEL WHEN</th>
<th>DO YOU NEED TO DO SOMETHING ABOUT YOUR FEELING?</th>
<th>WHAT YOU CAN DO ABOUT IT</th>
</tr>
</thead>
<tbody>
<tr>
<td>You forgot to do your homework</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Someone bumps into you in the hallway</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>You have just had a really hard time in PE</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>You get a bad grade on a test and you really studied hard</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>You get a bad grade on a test and you didn’t study</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Someone calls you a name</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>You didn’t understand what the teacher wanted you to do</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>The cafeteria is out of your favorite food</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>The girl or boy you like has a new boyfriend or girlfriend</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>
**Contributors to This Issue**

**Aileen Collucci** is a licensed speech-language pathologist with a private practice in Little Falls, New Jersey. She specializes in the diagnosis and treatment of persons with social-communication deficits. Aileen has over 18 years of experience in the field, which includes developing and leading a successful social-communication skills group intervention program in Fairfield, New Jersey. She has conducted training workshops for parents of children with special needs and educational professionals in many areas, including social skills intervention planning, autism, and pragmatic language development and disorders. She holds a master’s degree in speech-language pathology and audiology from New York University and state licenses in speech and language pathology in both New Jersey and New York. She also maintains a Certificate of Clinical Competence from the American Speech-Language and Hearing Association.

**Heather Pugh** is an editorial associate for AAPC and marketing consultant.

**Resources for the Main Event Are:**

To order the following resources, go to www.aapcpublishing.net or call us toll free, 1.877.277.8254.


**Resources Used in This Issue to Address Sensory Issues Include:**

To order, go to www.aapcpublishing.net or call us toll free, 1.877.277.8254.


**Supplemental Research Article**


Introducing Yourself

General Information for All Personnel

Basic communication skills, such as introducing oneself to others, greetings, and farewells, are difficult for learners on the spectrum. While others seem to automatically know this information or pick it up incidentally, students with ASD need direct instruction and a lot of practice.

Help students learn these skills in a natural setting – the school.

For example, when you see a student, greet her. If she does not respond or responds in an unexpected or nontraditional manner, nicely pull her aside and tell her that you are working on greeting skills and would like to “try it again.” Then have her respond with a nod, wave, smile, or “hi.” Create other opportunities around introductions and farewells.

These basic skills are the building blocks of good social interactions that can have not only short-term but also long-term benefits, such as helping students meet new people, establish friendships, and have successful job interviews.
Introducing Yourself – Word Search Answers

Word Bank:
- FRIENDLY
- GREETING
- HELPFUL
- IMPRESSION
- INFORMATION
- INTRODUCE
- NICE
- OPPORTUNITY
- PLEASANT
- POLITE
- POSITIVE
Introducing Yourself – Crossword Answers

ACROSS
1) a two-way verbal communication
2) a vague notion, impression, or belief
5) with good manners; nicely
9) cause to be acquainted
10) a good chance

DOWN
3) qualities that bring pleasure
4) clasping hands to greet someone
6) pretend something did not just happen
7) a way of being that makes others feel good
8) being socially correct
Introducing Yourself – Quiz

Name: ____________________________________

1. There are many different ways to introduce yourself.
   Yes    No

2. Greetings, introductions, and farewells are usually for formal things like parties, job interviews, and meetings.
   Yes    No

3. If someone new is sitting with your friends at lunch, you should wait for someone to introduce you to the new person.
   Yes    No

4. Africa is the only continent without reptiles and snakes.
   Yes    No

5. Sensory regulation means that you understand your senses and know what to do to make yourself feel okay.
   Yes    No
### Introducing Yourself – Quiz Answers

1. There are many different ways to introduce yourself.  
   - **Yes**  
   - **No**

2. Greetings, introductions, and farewells are usually for formal things like parties, job interviews, and meetings.  
   - **Yes**  
   - **No**

3. If someone new is sitting at lunch with your friends, you should wait for someone to introduce you to the new person.  
   - **Yes**  
   - **No**

4. Africa is the only continent without reptiles and snakes.  
   - **Yes**  
   - **No**

5. Sensory regulation means that you understand your senses and know what to do to make yourself feel okay.  
   - **Yes**  
   - **No**
Review

Language Use in Social Interactions of School-Age Children With Language Impairments: An Evidence-Based Systematic Review of Treatment

Sima Gerber, Alejandro Brice, Nina Capone, Martin Fujiki, and Geralyn Timler

Introduction: Pragmatic models were first applied to the treatment of children with language impairment in the late 1970s. Since that time, the study of language use has had considerable impact on language assessment and treatment. Despite the need to address pragmatic language skills clinically, there has been no systematic examination of the efficacy of treatments developed for this purpose.

Method: In accordance with the evidence-based practice policy agenda, the American Speech-Language-Hearing Association (ASHA) convened an ad hoc committee on language use in social interactions in school-age children. The committee’s charge was to develop an evidence-based systematic review of treatment for disorders of language use in social interactions. This charge was conducted in collaboration with ASHA’s National Center for Evidence-Based Practice in Communication Disorders.

Results: This systematic review provided preliminary support for the feasibility of various treatment procedures addressing social communication behaviors. Gains were reported in topic management skills, narrative production, and repairs of inadequate or ambiguous comments.

Conclusion: Because further investigation of these treatments is warranted, the committee is unable to make empirically supported recommendations for changes in standard clinical practice based solely on this review. More research is needed to examine the feasibility of interventions that focus on children’s language use.

Key Words: social communication, language intervention, school-age children, pragmatics

Determining the efficacy of treatment has long been a concern to the health-related professions. In the last decade, this concern has given rise to systematic procedures for evaluating the evidence for various treatment approaches across a range of disciplines. Evidence-based practice (EBP) refers to an approach in which current, high-quality research evidence is integrated with practitioner expertise and client preferences and values into the process of clinical decision making (American Speech-Language-Hearing Association [ASHA], 2005). In the field of speech-language pathology, the first sessions on EBP were presented at the ASHA annual convention in 1999. The construct of EBP was endorsed by ASHA in a technical report (ASHA, 2004) and a position statement (ASHA, 2005; Doolaghan, 2007). In accordance with the EBP policy agenda, in 2006, ASHA convened an ad hoc committee on language use in social interactions in school-age children.1

1 Members of the committee from December 2006 to December 2007 were Sima Gerber (Chair), Alejandro Brice, Nina Capone, Martin Fujiki, Audrey Holland, Norma Rees, and Geralyn Timler. Members of the committee from January 2008 to December 2010 were Sima Gerber (Chair), Alejandro Brice, Nina Capone, Martin Fujiki, and Geralyn Timler. Ann-Mari Pierotti served as the ex-officio, Brian Shultman served as the monitoring officer from 2006 to 2008; Julie Noel served as the monitoring officer from 2008 to 2010. Diane Paul, ASHA’s Director of Clinical Issues in Speech-Language Pathology, served as a consultant to the committee. ASHA’s National Center for Evidence-Based Practice in Communication Disorders (N-CEP) conducted the systematic review and appraisal of the literature and contributed to this report. N-CEP staff members who participated in this work were Tobi Frymark, Rob Mullen, Tracy Schooling, and Beverly Wang.
The charge of the committee was to develop an evidence-based systematic review (EBSR) of treatment for disorders of language use in social interactions. This charge was conducted in collaboration with ASHA's National Center for Evidence-Based Practice in Communication Disorders (N-CEP). The committee was also charged with determining the need for subsequent documents (e.g., technical report, guidelines) based on the results of the EBSR. The current article is a report of the EBSR that was completed by the committee.

Because the original charge to the committee was broad, the first step in the process was to refine the review's focus. The revised charge was to develop an EBSR related to social communication disorders in school-age children with language impairment (LI) in collaboration with ASHA's N-CEP and to determine the need for subsequent documents based on the results of the EBSR. The committee decided to focus its work on school-age children rather than cover the entire lifespan. Further, the committee decided to exclude children whose language performance falls below age-level expectations due to sensory deficits (e.g., hearing loss, neurodevelopmental disorders, autism spectrum disorders [ASDs]), brain damage (e.g., traumatic brain injury), or intellectual disability (as indicated by IQ performance <70). Children with language-based learning disabilities (LLD) were included as well as children with pragmatic language impairments (PLIs) who did not have ASDs. The decision to exclude studies related to children with ASDs in this EBSR was based on the recent publication of an ASHA document (ASHA, 2006) that addressed intervention issues for this population. Our decision to focus on children with LI was motivated by the growing body of evidence revealing social interaction differences in some of these children and the negative consequences of these differences.

Background

When considered from a modular perspective, deficits of language use are identified in relation to strengths and limitations in language form and content. Thus, for a difficulty (e.g., failure to respond to questions) to be considered as a fundamental pragmatic problem, a child would have to perform more poorly than typically developing (TD) children who are at a similar level of language development. When considered in this way, a number of comparisons have found that children with LI performed similarly to their language age–matched peers (Fey & Leonard, 1984; Leonard, 1986). Other studies have shown that children with LI have the same pragmatic functions as TD children; however, they do not use these functions as effectively as their TD peers (Conti-Ramsden & Friel-Patti, 1983). These findings have been interpreted to mean that the observed deficits in language use stem from problems with language form and content rather than a lack of pragmatic knowledge.

There is growing evidence, however, that some individuals with LI have interactional difficulties that are unrelated to their problems with language form and content (Bishop, Chan, Adams, Hertley, & Weir, 2000; Brinton, Fujiki, & Powell, 1997). There are also indications that some children have pragmatic difficulties (e.g., being nonresponsive to conversational partners in the face of relatively good structural skills but do not meet the assessment criteria for ASDs (Conti-Ramsden, Crutchley, & Botting, 1997). Originally identified as “semantic pragmatic deficit syndrome,” this category has since been relabeled as “PLI.” The existence of individuals who seem to fall between the categories of ASDs and specific language impairment (SLI), as well as the variability within each of the categories, has led to the proposal that these impairments exist on a continuum rather than being distinctly separate categories (Bishop, 2003a).

Whether the social interactional difficulties of children with LI stem from structural language limitations or from deficits in other areas, it is clear that these individuals often experience problems performing basic social communication tasks. These difficulties include entering ongoing social interactions (Brinton, Fujiki, Spencer, & Robinson, 1997; Craig & Washington, 1993; Liwa & Cleave, 2005), negotiating with peers (Brinton, Fujiki, & McKee, 1998), participating in cooperative groups (Brinton, Fujiki, & Higbee, 1998), dealing with conflicts (Horowitz, Jansson, Ljungberg, & Hedenbro, 2006; Timler, 2008), and formulating cohesive narratives to retell past events (Swanson, Fey, Mills, & Hood, 2005). Children with LI also experience a range of negative social outcomes, including high levels of withdrawal (Hart, Fujiki, Brinton, & Hart, 2004; Redmond & Rice, 1998), few friends (Fujiki, Brinton, Hart, & Fitzgerald, 1999), low self-esteem (Jerome, Fujiki, Brinton, & James, 2002), and high rates of victimization (Conti-Ramsden & Botting, 2004).

Statement of the Problem

The difficulties described above often indicate the need for treatments designed to address language use in social interactions. Although treatments designed to improve language form and content are critical, it is not likely that such treatments, by themselves, will address difficulties in social interaction. Pragmatic models were first applied to the treatment of children with LI in the late 1970s (Gallagher, 1990). Since that time, the study of language use in social interaction has had considerable impact on language assessment and treatment. For example, there is general acceptance that assessment activities must be planned with consideration of the influence of contextual variables such as examiner, topic
of discussion, and physical location. With respect to treatment, there is greater understanding of the role that context may play in both the acquisition of behavior and the generalization of learning. Context variables for school-age children have focused on the acquisition of pragmatic skills that are critical to specific discourse genres such as conversation and narration (for examples, see Brinjikji, Robinson, & Fujiki, 2004; Godfrey, Pring, & Gascoigne, 2005; Mennis, 1994; Ukrainetz, 1998) and specific social communication situations including entering peer groups, sustaining interactions in cooperative play and work groups, and negotiating and resolving conflicts (Beilinson & Olswang, 2003; Kavale & Mostert, 2004; Thieman & Goldstein, 2004; Timler, Olswang, & Coggins, 2005). Relevant pragmatic skills for these genres and social situations include turn taking, repair of communication breakdowns, contingent commenting, responding to questions as well as initiating questions to request more information or clarification, and other topic management skills. Despite the need to address these areas clinically and the considerable amount of time and energy that clinicians expend to address these skills, there has been no systematic examination of the efficacy of treatments aimed at changing children’s language use in social interactions. To address this gap, the committee used a systematic review process to evaluate such studies.

Research Questions

The ASHA ad hoc committee developed clinical research questions after numerous discussions on the definition of social language use and various treatment approaches. The questions were meant to be inclusive, yet not repetitive, of current treatment approaches in social language use for children with LI. The questions addressed language-based social communication impairments and the effect of the 11 independent variables on language use in social interactions. Specifically, the 11 independent variables consisted of (1) positive behavioral support, (2) parent treatment programs, (3) milieu teaching treatments, (4) communication partners treatment, (5) peer mediation, (6) conversation/discourse treatments, (7) pragmatic treatments, (8) social skills training treatments, (9) applied behavioral analysis, (10) narrative/discourse treatments, and (11) response training treatments.

METHOD

To be included in this systematic review, studies had to have (a) been published in a peer-reviewed journal from 1975 to June 2008, (b) been written in English, and (c) contained original data pertaining to one or more of the 11 clinical questions. Inclusion criteria consisted of school-age children, ages 5 to 11 years, with LI and accompanying social communication/pragmatic deficits as identified and defined by the study’s investigators (i.e., the authors of the reviewed studies) and the treatment goals of the study. Children with LDs were included if one or more language measures was provided in the participant description section of the study. Studies were excluded from the review if the participants had social communication impairments that were secondary to other conditions associated with LI (e.g., attention deficit hyperactivity disorder, ASDs, behavior disorders, developmental disabilities, Down syndrome, mental retardation, selective mutism, stuttering, and traumatic brain injuries).

Literature Search

A systematic search of 22 electronic databases was conducted from October 2007 to June 2008 using key words related to social communication impairments or treatments (see the Appendix). ASHA journals and authors with a history of publications in social communication were also searched. In addition, a hand search of all relevant references from retrieved studies was conducted. Two N-CEP reviewers independently evaluated a total of 836 citations for preliminary inclusion, with 85% agreement. Based on the inclusion criteria, 14 studies were provisionally accepted. Before final inclusion into the EBRS, the full list of accepted and rejected studies with reasons for inclusion/exclusion was reviewed by the ASHA committee. Two additional studies that had initially been rejected by N-CEP were included after review by the committee revealed that the studies met the inclusionary and exclusionary criteria. Seven studies were excluded because the participants had social communication impairments secondary to diagnoses other than LI. One longitudinal case study was excluded because data were not provided for the relevant age range of 5 to 11 years. After a careful review of all studies and their inclusion and exclusion criteria, a total of eight studies was included in this EBRS.

Accepted studies were evaluated for methodological rigor using the levels of evidence scheme adopted by the ASHA N-CEP committee (Mullen, 2007). Two N-CEP reviewers appraised each study independently on six of the seven quality indicators listed below. A point was awarded for each indicator if the following criteria were met:

- **Study protocol**: The design of the study was described in sufficient detail so that it could be replicated.
- **Blinding**: Testers and coders were blind to the participants’ group assignment.
- **Random allocation**: Participants were selected at random and were assigned randomly to groups, with a clear description of the randomization procedures.
- **Treatment fidelity**: Procedures for determining that the treatment was implemented as intended were clearly described.
- **Significance**: A statistical test of either pretest–posttest or between-group gains following treatment was reported.

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or data were provided to allow statistical tests to be performed.

- **Practical significance**: An effect size to evaluate the clinical importance of the reported changes, such as \( d \), was reported along with confidence limits surrounding \( d \), or data sufficient to calculate \( d \) and confidence limits were provided.

- **Intention to treat**: Studies that were identified as efficacy studies (i.e., treatments rigorously tested under ideal, highly controlled conditions) were given 1 point if there were no dropouts from the original group assignments. (Because none of the included studies were efficacy studies, the intention to treat analysis was not relevant).

Each study was appraised by at least two members from the committee who were randomly assigned to an article. Discrepancies in appraisal ratings between N-CEP and the committee were discussed and were resolved via 100% group consensus. Interrater reliability of study quality was determined using the kappa statistic (Cohen, 1960). Agreement between blinded N-CEP reviewers and between N-CEP reviewers and the ASHA committee was \( \kappa = .727 \) and \( \kappa = .680 \), respectively. Level of agreement between reviewers was considered “substantial” (\( \kappa = 0.61–0.80 \); Landis & Koch, 1977).

In addition to determining the methodological quality of the included studies, N-CEP and the ASHA committee completed data extraction on various participant and treatment characteristics and identified the research stage of each study. The continuum of research stages included exploratory research, treatment approaches that were developed and assessed in the context of whether they showed promise of being efficacious; efficacy research, treatments that were rigorously tested under ideal, highly controlled conditions; effectiveness research, treatments that were tested in a “real-world” clinical setting; and cost-benefit/public policy research, treatments that were conducted in the political and economic environment in which they are best delivered.

### RESULTS

**Clinical Questions**

The systematic search revealed eight studies that were relevant to the clinical questions and parameters posed by the committee. Only three of the original 11 clinical questions developed by the committee were addressed by these eight studies. Five studies addressed clinical question #6: “Is there an effect of conversation/discourse treatment on language use in social interactions?” Two studies addressed clinical question #7: “Is there an effect of pragmatic treatments on language use in social interactions?” One study addressed clinical question #10: “Is there an effect of narrative discourse treatment on language use in social interactions?” Due to the small number of studies that were identified and the lack of effect size statistics, descriptive analyses of these studies are collapsed across the three clinical questions in the following sections.

**Study Design**

The designs of each study were classified as follows: Two studies (Adams, 2001; Klecan-Aker, 1993) were identified as “case studies”; that is, a study with uncontrolled observation (descriptive) report of events and outcomes in one or more participants. Two studies (Adams, Lloyd, Aldred, & Baxendale, 2006; Swanson et al., 2005) used “case series” designs whereby pretest–posttest data were collected across a sequence of individual participants. One study (Merrison & Morrison, 2005) used a group comparison in which differences in outcomes were explored across three diagnostic groups. Two studies (Bedrosian & Willis, 1987; Dollaghan & Kaston, 1986) used single-subject designs to examine within- and between-subject differences. Finally, one study (Richardson & Klecan-Aker, 2000) used a pretest–posttest group design.

**Methodology Quality and Research Stage**

Table 1 summarizes the presence or absence of the six quality indicators (as noted in the last section, the seventh indicator “intention to treat” was not applicable for any of the studies) and subsequent identification of the research stage, as well as the clinical questions addressed by each study.

The quality indicator scores for the studies ranged from 0 to 4 out of a possible 6 points for study protocol description, blinding, sampling/selection, research design, treatment fidelity, and practical significance. Five of the eight studies provided sufficient description of the study protocol so that the treatment could be replicated (Adams et al., 2006; Dollaghan & Kaston, 1986; Klecan-Aker, 1993; Richardson & Klecan-Aker, 2000; Swanson et al., 2005); however, only two studies (Adams, 2001; Swanson et al., 2005) explicitly stated that the assessors were blind to the study conditions. None of the studies used random assignment. Only one study described measures of treatment fidelity (Swanson et al., 2005). Three studies reported significant differences between pre- and posttreatment measures (Adams, 2001; Adams et al., 2006; Swanson et al., 2005). Only one study (Bedrosian & Willis, 1987) received a point for practical significance (i.e., effect size statistics); this study reported means and standard deviations of the pre- and posttest measures. Due to the uniformly low quality indicator scores, all studies were identified as “exploratory,” that is, the results from each of these studies show promise of feasibility; however, the treatments need to be rigorously tested under highly controlled conditions before the efficacy of the treatments can be demonstrated.


<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Adequate protocol description</th>
<th>Assessor blinding</th>
<th>Random sampling described</th>
<th>Treatment fidelity</th>
<th>Significance</th>
<th>Practical Significance</th>
<th>Intention to treat (when applicable)</th>
<th>Quality indicator score</th>
<th>Research stage</th>
<th>Clinical question$^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams (2001)</td>
<td>Case study</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
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<td>6,7</td>
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<td>Case series</td>
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<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
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<td>Single subject</td>
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<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>N/A</td>
<td>1</td>
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<td>6</td>
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<tr>
<td>Dollaghan &amp; Kasten (1986)</td>
<td>Single subject</td>
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<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>Klecan-Aker (1993)</td>
<td>Case study</td>
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<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>1</td>
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<td>10</td>
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<td>Merrison &amp; Merrison (2005)</td>
<td>Group comparison</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>0</td>
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<td>6</td>
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<td>Richardson &amp; Klecan-Aker (2000)</td>
<td>Pretest-posttest design</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>1</td>
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<td>6</td>
</tr>
<tr>
<td>Swanson, Fey, Mills, &amp; Hood (2005)</td>
<td>Case series</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
<td>4</td>
<td>Exploratory</td>
<td>10</td>
</tr>
</tbody>
</table>

$^a$Question #6 – “Is there an effect of conversation/discourse treatment on language use in social interactions?” Question #7 – “Is there an effect of pragmatic treatments on language use in social interactions?” Question #10 – “Is there an effect of narrative discourse treatment on language use in social interactions?”
Participants

The number of participants in the studies ranged from single cases to a group of 20. Generally, the number of participants enrolled in studies of this kind has increased. The three earliest studies included one to four participants (Bedrosian & Willis, 1987; Doleghan & Kaston, 1986; Klecan-Aker, 1993); the latter five studies included the following number of participants: two (Adams, 2001), five (Adams et al., 2006), nine (Merrison & Merrison, 2005), 10 (Swanson et al., 2005), and 20 (Richardson & Klecan-Aker, 2000). Participants ranged in age from 5:0 (years;months) to 11:0. More males were recruited than females; however, three of the studies did not report the participants’ gender. None of the studies reported ethnicity. A detailed description of the study participants is provided in Table 2.

Treatment Goals and Procedures

Treatment goals were identified using a range of assessment procedures, including conversational language samples (Adams, 2001; Adams et al., 2006; Bedrosian & Willis, 1987; Richardson & Klecan-Aker, 2000; Swanson et al., 2005), narrative samples (Adams, 2001; Klecan-Aker, 1993; Swanson et al., 2005), and investigator-designed criterion-referenced assessments (Doleghan & Kaston, 1986; Merrison & Merrison, 2005). Two of the studies used changes in standard scores to document some of the effects of the treatment (Adams, 2001; Adams et al., 2006); however, none of the studies used norm-referenced assessments to identify treatment goals.

Both comprehension and production goals were developed. Comprehension goals included teaching participants strategies for monitoring their own comprehension (Doleghan & Kaston, 1986) as well as the comprehension of their listeners through repair of communication breakdowns (Merrison & Merrison, 2005). Production goals focused on increasing participants’ topic initiation (Bedrosian & Willis, 1987) and topic maintenance skills (Adams, 2001; Adams et al., 2006; Richardson & Klecan-Aker, 2000) and decreasing irrelevant comments and questions (Adams, 2001; Adams et al., 2006). In studies that used narratives as the context for treatments (Klecan-Aker, 1993; Swanson et al., 2005), the goals included increases in the number of story grammar components such as settings, plans, and resolutions and improvement in the overall cohesion of the narrative (i.e., linguistic devices used to connect the elements of the text such as articles and conjunctions). Some of the studies targeted broader social communication goals such as appropriate use of prosody (Adams, 2001), identification of emotions (Richardson & Klecan-Aker, 2000), and improvement of social understanding and metapragmatics (e.g., “helping the child to become consciously aware of communication rules and knowledge,” Adams, 2001, p. 293), but procedures for obtaining these broader goals were not as explicitly detailed as the procedures for obtaining the more traditional topic management goals.

The treatment procedures implemented to address the treatment goals can be summarized as modeling of behaviors (Adams, 2001; Adams et al., 2006; Bedrosian & Willis, 1987), practice and/or role play of behaviors (Adams, 2001; Adams et al., 2006; Doleghan & Kaston, 1986; Klecan-Aker, 1993; Merrison & Merrison, 2005; Swanson et al., 2005), metapragmatic discussion of behaviors (Adams et al., 2006; Bedrosian & Willis, 1987; Doleghan & Kaston, 1986; Klecan-Aker, 1993; Richardson & Klecan-Aker, 2000), and caregiver training (Adams et al., 2006).

The frequency and duration of the treatments were variable. Seven studies administered treatment one to 3 times a week (Adams, 2001; Adams et al., 2006; Bedrosian & Willis, 1987; Doleghan & Kaston, 1986; Klecan-Aker, 1993; Merrison & Merrison, 2005; Swanson et al., 2005). One study reported that children received 30 min of treatment weekly but did not report the number of sessions each week (Richardson & Klecan-Aker, 2000). Five studies conducted treatment for a period of 4 to 8 weeks (Adams et al., 2006; Doleghan & Kaston, 1986; Merrison & Merrison, 2005; Richardson & Klecan-Aker, 2000; Swanson et al., 2005); two studies had a duration of 10–12 weeks (Adams, 2001; Klecan-Aker, 1993), and one study had a duration of 6 months (Bedrosian & Willis, 1987). The treatment schedule, outcomes, and limitations of each study are provided in Table 2.

Study Outcomes and Limitations

Effect sizes could not be calculated for seven of the eight studies. Therefore, the results will be discussed descriptively. First, of the eight studies, only three were published before 2000, and these were in the years 1986, 1987, and 1993. The remaining five studies were published since 2000. As noted in the Participants section, the eight studies enrolled between one and 20 participants. Power analyses were not computed due to the small size of the samples. In addition to small samples, outcome measures varied considerably across the studies so that cumulative effect sizes could not be calculated.

Individual studies reported improvements in one or more pragmatic targets as assessed by investigator-designed measures (e.g., Doleghan & Kaston, 1986) or standard scores (e.g., Adams, 2001; Adams et al., 2006). Gains in topic management skills were reported, including increases in initiations, relevancy, topic maintenance, and use of cohesion (Adams, 2001; Adams et al., 2006; Bedrosian & Willis, 1987; Richardson & Klecan-Aker, 2000). Gains were also reported in narrative production related to an increase in story grammar components (Klecan-Aker, 1993; Swanson et al., 2005) and in repairs of inadequate or ambiguous comments in direction tasks (Doleghan & Kaston, 1986; Merrison & Merrison, 2005). Changes in skills related to semantic and structural aspects of language were mixed;
<table>
<thead>
<tr>
<th>Study</th>
<th>Population (diagnosis; age; grade; gender; race/ethnicity)</th>
<th>Diagnosis described/Standardized tests used</th>
<th>Frequency/duration</th>
<th>Outcomes</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams (2001)</td>
<td>PLI; n = 2; 7:3–10:3; NR; 2M; NR</td>
<td>Yes/Yes</td>
<td>3 × week/10 wks</td>
<td>Subject 1: Increase in relevant responses with decreases in inadequate/pragmatically problematic responses</td>
<td>Vague diagnostic criteria for PLI; inadequate description of treatment procedures, not possible to replicate; outcomes were assessed from very brief language samples; statistical and clinical significance of results could not be interpreted; no maintenance and generalization data</td>
</tr>
<tr>
<td>Adams et al. (2006)</td>
<td>PLI; n = 5; 6:0–9:11; NR; NR; NR</td>
<td>Yes/Yes</td>
<td>3 × week; 1-hr sessions/8 weeks</td>
<td>Decreases in conversational dominance, loquacity, verbosity, assertiveness, responsiveness, response problems, and pragmatic problems on a Conversation Assessment task</td>
<td>Small sample size; subjects identified as having PLI and not autism, but could have possibly been high-functioning children with pervasive development disorders or on the lower end of the autism spectrum; inadequate description of treatment procedures, not possible to replicate; no maintenance and generalization data</td>
</tr>
<tr>
<td>Bedrosian &amp; Willis (1987)</td>
<td>SLI; n = 1; 5:0; K; 1M; NR</td>
<td>Yes/Yes</td>
<td>2 × week; 30-min sessions/6 months</td>
<td>Increases in the targets (i.e., memory-related and future-related topic initiations); frequency of “here and now” topic initiations remained stable</td>
<td>Small sample size; no normative information regarding what levels of initiation are expected for a child this age; no maintenance and generalization data</td>
</tr>
<tr>
<td>Dollaghan &amp; Kaston (1986)</td>
<td>SLI; n = 4; 5:10–8:2 (M = 6:9); 1st; NR; NR</td>
<td>Yes/Yes</td>
<td>3 × week; 4–5 weeks</td>
<td>Gains were demonstrated in all 4 treatment goals; all participants demonstrated an increase in the percentage of verbal queries of inadequate commands; maintenance demonstrated 3 to 6 weeks after end of treatment</td>
<td>Small sample size; mixed expressive and receptive language profiles; control behavior was not included; no functional outcome measures used</td>
</tr>
</tbody>
</table>

*(table continues)*
Table 2 (p. 2 of 3). Aspects of the studies and their participants.

<table>
<thead>
<tr>
<th>Study</th>
<th>Population (diagnosis; age; grade; gender; race/ethnicity)</th>
<th>Diagnosis described/Standardized test used</th>
<th>Frequency/duration</th>
<th>Outcomes</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kleeen-Aker</td>
<td>LLT; n = 1; 8,8; 2nd; 1M; NR</td>
<td>Yes/Yes</td>
<td>2 × week; 1-hr sessions/12 weeks</td>
<td>Two oral and written narratives were collected from the participant pre and post treatment; narratives were assigned a level of complexity from level 1 (no use of story grammar components) to level 5 (an initiating event, attempt, consequence, resolution plus a setting or internal response); narrative complexity increased from level 2 to levels 4-5 in pre/post measures; number of t-units increased from an average of 5 to 8-10</td>
<td>Sample size limited to 1 participant; therefore, no replication opportunities or other experimental controls; no maintenance and generalization data</td>
</tr>
<tr>
<td>Morrison &amp; Morrison</td>
<td>SLI-PLI-Normal controls; n = 9; 7-11 (M could not be calculated); UK years 1-3; 9M, 11F; NR; NR</td>
<td>Yes/Yes</td>
<td>1 × week; 6 weeks</td>
<td>PLI group initiated various repairs more frequently at completion of treatment (i.e., 78% post treatment vs. 0% pretreatment)</td>
<td>Subject description and categorization is limited to diagnosis by treating speech and language therapist; no formal testing completed by researchers; small sample size; inadequate description of treatment procedures, not possible to replicate; data reported in percentages based on group performance with no normative information regarding what levels of repair are expected for children this age; no information provided about who completed the data analysis and whether coding reliability was assessed for the outcome measure; no maintenance and generalization data</td>
</tr>
</tbody>
</table>

*(table continues)*
Table 2 (p. 3 of 3). Aspects of the studies and their participants.

<table>
<thead>
<tr>
<th>Study</th>
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<th>Outcomes</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richardson &amp; Klecan-Aker (2000)</td>
<td>LLI; n = 20; Group 1: 7;6–9;8 (M = 8;1); 1–2; 6M, 3F; NR/Group 2: 6;5–8;1 (M = 7;3); K; 5M, 6F; NR</td>
<td>Yes/Yes</td>
<td>Weekly; 30 min/6 weeks</td>
<td>Positive changes in starting a conversation and maintaining a conversation across both classrooms; positive changes for ending a conversation were reported for one group (the other group was already at 100% in baseline so no changes could be noted)</td>
<td>Small sample size; sample of convenience (i.e., two classrooms); limited number of pragmatic indicators investigated and only descriptive data were provided; examples of treatment activities provided but specific stimulus-response instructions are not explicitly stated so replication of study would be difficult; no maintenance and generalization data</td>
</tr>
<tr>
<td>Swanson et al. (2005)</td>
<td>SLI; n = 10; 6;11–8;9 (M = 7;10); NR; 8M, 2F; NR</td>
<td>Yes/Yes</td>
<td>3 × week; 50 min/6 weeks</td>
<td>Eight of 10 children showed significant improvement (p &lt; .014) in NQ score (improvement defined as an increase of ≥1.45 based on the authors' previous work; only 1 child demonstrated clinically significant gains in number of different words; little or no positive change in developmental sentence score and conversational and narrative samples; no significant changes in sentence imitation and nonword repetition)</td>
<td>No control group; small N and heterogeneous N; treatment approach is still under development; relatively brief period of treatment; no maintenance and generalization data; psychometric properties of the narrative task are not known (e.g., test-retest reliability)</td>
</tr>
</tbody>
</table>

Note. PLI = pragmatic language impairment; NR = not reported; SLI = specific language impairment; LLI = language learning impairment.
Gains were reported in word finding (Adams, 2001) and in sentence imitation and formulation (Adams et al., 2006) but not in measures of sentence length and complexity (Swanson et al., 2005). A major limitation to the interpretation of the significance of the reported gains is that the magnitude and external validity and reliability of the outcomes were largely uncalculated. As such, the outcomes of these studies support the feasibility of using various interventions to change specific pragmatic behaviors, but the generalizability of these results has not been demonstrated.

**DISCUSSION**

It is standard practice to discuss the strengths and limitations of research studies. Given the challenges inherent in conducting research in the area of pragmatics, we might consider the core of studies reviewed here as pioneering and look at the “limitations” as considerations for future research in this area. Nonetheless, the conclusions and implications from the studies, individually and as a whole, are best reviewed with an awareness of the studies’ weaknesses.

Although the nature of the research reviewed does not allow for easy summary of the results, the results of the EBSR have been organized into three main sections: First, the quantity and quality of the research reported here can be summarized. This includes the number and type of clinical questions that were addressed in the review, the kind of study designs that were used, the quality of the methodology, and the research stage of the studies. The second issue relates to the nature of the treatment, that is, who the participants in the studies were, the treatment goals that were addressed, the range of treatment procedures that were used, and the outcomes of the studies. Finally, the conclusions from the EBSR itself can be presented.

**Quantity and Quality of the Research**

In reference to the first issue, only eight studies were identified that fit the criteria of the EBSR (e.g., published between 1975 to June 2008), and these studies addressed only three of the original 11 clinical questions. These questions related to the effect of conversation/discourse, pragmatic, and narrative treatments on language use in social interactions. This suggests that for the population of children studied, treatment studies using more specifically defined approaches such as positive behavioral supports, milieu teaching, and applied behavior analysis are not typical. The likelihood that these approaches are used more often with children who are in other diagnostic groups, such as ASDs, would likely explain this finding. In terms of the study design, case studies, case series, single subject, and group designs were used. The methodological quality of the eight studies ranged considerably, with “adequate protocol description” being present in five of the eight studies. The research stage for all eight studies was considered exploratory. A review of these findings suggests that treatment on language use in social interaction, at least with the population targeted here, is clearly in its infancy. It is notable, however, that at the current time, a randomized control trial study on pragmatic language intervention is being conducted at the University of Manchester (Adams, 2008). The results of the Manchester work were not available for inclusion in this EBSR.

As researchers design and carry out pragmatic treatment studies in the future, it will be important to consider the quality standards that were used to evaluate the treatment research. It should also be noted, however, that these standards are most appropriate for evaluating large-group experimental designs. When applied to the study of pragmatic language problems, these standards have potential limitations. Individuals with pragmatic impairments form a heterogeneous group. This heterogeneity impacts the effectiveness of traditional group designs in evaluating treatment effects. For example, in most cases of pragmatic impairment, it cannot be assumed that the individuals in a treatment group have similar problems, or that they will respond in the same way to a treatment. In recognition of this variability, single-subject designs provide a viable alternative method for evaluating pragmatic treatments. These designs may not lend themselves to many of the standards used to evaluate large-group clinical trials, such as blinding, random assignment to treatment, or the calculation of a p value to determine if effects occurred by chance. The development of standards to more fully evaluate single-subject designs in the critical appraisal process is an important need.

A related issue of importance that had a minor impact on this critical appraisal, but could be more influential in the future, is the lack of standards to evaluate qualitative research designs. There are cases in which these designs are likely to provide greater insights into behavior than traditional group designs. As is the case for single-subject designs, it will be important to develop specific standards to assess qualitative outcome measures.

**Nature of the Treatment**

In reference to the second issue, nature of the treatment, or the question of who the participants in the studies were, the nature of the treatment goals that were addressed, and the range of treatment procedures that were used, several points should be made. The number of participants in the studies ranged from single cases to 20 children. As noted earlier, it is possible that future examination of research protocols in the area of language use will be best addressed using single-subject designs. Although some of the studies had a small sample size, of greater concern was the fact that across the studies, children did not represent a homogeneous diagnostic group, and the diagnosis of PLI did not seem to be a
homogeneous construct. In reference to the first concern, the children in the studies included children who had been diagnosed with SLI, LI, or language disorders (Dollaghan & Kaston, 1986; Merrison & Merrison, 2005; Swanson et al., 2005), children who had been diagnosed with semantic-pragmatic language disorder (Adams, 2001), children who had been diagnosed with PLI (Adams et al., 2006; Merrison & Merrison, 2005), children who had been diagnosed with learning disabilities (Richardson & Kelen-Aker, 2000), and children who were not given a diagnosis (Bedrosian & Willis, 1987). As noted previously, studies with participants with ASDs were excluded from this review.

Some subject descriptions raised questions as to who the children were, particularly when the children were described as having PLI. There were questions about whether some of the children included in the studies reviewed here might be more similar to children who were theoretically excluded from this EBSR, for example, children on the autism spectrum. In those studies where the term PLI was used, the criteria varied. For example, in the Adams et al. (2006) study, six children who had been diagnosed as having PLI were included. Among the criteria for inclusion were (a) speech and language practitioners judged them to have communication difficulties principally in the domain of pragmatics; (b) scored less than 21 (cut-off for autism) on the Autism Diagnostic Interview—Revised (ADI-R) (Lord, Rutter, & Le Couteur, 1994); and (c) pragmatic composite scores less than 132 on the Children’s Communication Checklist (Research version) (CCC; Bishop, 1998).

In the Merrison and Merrison (2005) study, one group had three children with significant pragmatic difficulties, and one group had three children with language disorders but no pragmatic difficulties. The authors suggested that the children were diagnosed by their speech-language pathologist (SLP) following formal testing and clinical informal assessment for more than a year. Although both the group with SLI and the group with PLI had difficulty with language structure, the group with PLI had additional difficulties with language use. Finally, in one study (Adams, 2001), one of the two children had a primary diagnosis of pragmatic impairment, and the other child had a secondary diagnosis of pragmatic impairment. The second subject had more extensive language deficits than the first. Despite the heterogeneity of the children studied, it appeared that most of the children identified were children with language limitations in the face of typical nonverbal intelligence.

The nature of the treatment goals addressed in the studies speaks to the broad continuum of language behaviors that can be considered under the umbrella of language use in social interaction. Both comprehension and production goals were targeted. Examples of production goals included increasing topic initiation and topic maintenance skills and decreasing irrelevant comments and questions. One study focused on nonlinguistic goals (prosody); others addressed metalinguistic goals. In many cases, researchers focused on the individual profiles of the children in treatment rather than enrolling participants into a general treatment program. In some of the studies, the treatment goals were not specific. For example, therapy focused on “pragmatic rules in conversation and discourse; turn-taking; meta-pragmatics; social understanding; social role-playing; conversations; narratives; and, inferential understanding” (Adams et al., 2006, p. 49).

The treatment procedures encompassed modeling, practice, role play, metapragmatic discussion, and caregiver training. In some of the studies, parents and school clinicians assisted in gathering the data. A number of the treatments were described in enough detail that they could be replicated (e.g., Dollaghan & Kaston, 1986; Richardson & Kelen-Aker, 2000); however, some studies did not describe the procedures in a way that would allow for replication: “Intervention...reflected current practice in pragmatics, i.e., building on strengths in communication through exercises and games in interpersonal communication and by developing strategies to promote more effective communication with others in the child’s environment” (Adams et al., 2006, p. 49). In one study (Adams et al., 2006) where metapragmatic therapy was done, there was no description of the nature of the treatment. In four of the studies, the frequency, intensity, and/or duration of the treatment were not reported. There were no control groups in any of the studies.

This review revealed that treatment goals and procedures to address language use in social interactions are highly variable. Operational definitions for treatment goals that focus on pragmatic language behaviors can be difficult to define. Moreover, traditional clinical pullout service delivery models and drill contexts, which are typical of language form and content interventions, may not be sufficient to achieve functional changes in children’s language use across partners, situations, and settings.

In reference to outcomes, as is typical in the study of pragmatics, the absence of normative data for the pragmatic behaviors studied was of concern. In all eight of the studies, primary outcomes were determined from investigator-developed measures related to the treatment targets that were the focus of the intervention. Five of the studies examined the inter-rater reliability of these measures (Adams, 2001; Adams et al., 2006; Bedrosian & Willis, 1987; Dollaghan & Kaston, 1986; Swanson et al., 2005). Only three of these five studies made an explicit statement about using raters who were blind to some aspect of the study (Adams, 2001; Adams et al., 2006; Swanson et al., 2005). A failure to examine whether the gains observed on these various measures generalized to materials, partners, and settings outside of the intervention programs was another concern.

As noted earlier, the “problems” with the studies can be best thought of as a reflection of the infancy of pragmatic treatment research and the inherent issues researchers face when designing treatment studies in this area. Nonetheless, although there was a great deal of variability in populations and methods used, most of the studies showed some gain...
in language use in social interactions. At times these gains were limited, but the fact that researchers across a range of settings, working with a variety of procedures, were able to achieve positive results is encouraging.

Conclusions from the EBSR

In summary, the results from this EBSR provide preliminary support for the feasibility of various treatment procedures to change selected social communication behaviors and pragmatic language skills. Because further investigation of each of these treatments is warranted, the committee is unable to make empirically supported recommendations for changes in standard clinical practice based solely on this review. It is important to remember that clinical expertise is one of the three bases of the current EBP paradigm proposed by ASHA. SLPs who routinely serve children with pragmatic problems and difficulties in language use in social interactions should continue to use the treatment procedures within their clinical practice that have supported positive treatment outcomes in the children they serve. It is likely that SLPs reading this review already use one or more of the treatment procedures reported here. The promise of these procedures needs to be validated by careful collection of treatment outcome data to add to the “clinical expertise” evidence base.

Needless to say, the paucity of the empirical literature in the area of language use in social interactions was surprising, even for experts in the area. As noted, the studies that were identified were exploratory, and the methodological rigor of the studies varied considerably. New methods and standards for evaluating qualitative research, case studies, case series, case control, and single-subject designs must be developed. Future research must also address replication of the approaches, larger sample sizes must be incorporated, and homogeneous treatment groups must be established in addition to the use of comparison control groups. In addition, when the feasibility of a treatment protocol is demonstrated, treatment manuals, which are used in related fields such as special education, must be developed to facilitate replication of the protocol procedures and results. For example, Adams used the results of her feasibility studies, two of which were included in this review, to develop a treatment manual for addressing language use in social interactions of children with PLI; a randomized controlled trial of this intervention is underway (Adams, 2008). In addition, more research is needed to develop and examine the feasibility of outcome measures that document changes in children's language use across various partners (e.g., peers and teachers) and settings (e.g., classroom and playground). Parent and teacher rating scales, such as the Children's Communication Checklist—2 (Bishop, 2003b) and the Clinical Evaluation of Language Fundamentals—Fourth Edition, Pragmatics Profile (Semel, Wiig, & Secord, 2003), may be useful for documenting such changes in future intervention studies.

Only when more systematic studies are completed can the true evaluation of treatment methods designed to improve language use in social interactions be assessed.

The limitations of this review led to a good deal of discussion about the parameters of the review and the nature of the topic itself—pragmatic treatment. In the end, the perspective that was taken was that this EBSR revealed the need for not only future research in the area, but perhaps more importantly, reconsideration of what good treatment research is, particularly in the area of language use in social interactions. Until more empirical evidence is available, the committee members wonder if there might be alternatives to EBSRs as a source of addressing the pressing questions that SLPs are posing, such as (a) what kind of pragmatic treatment is in the scope of practice for SLPs, (b) what are the best methods to identify pragmatic language difficulties in children, (c) how can pragmatic treatment best be conceptualized (particularly in light of individual differences and the contextual nature of pragmatic performance), and (d) how is progress best documented when the goals of therapy are nonlinguistic or linguistic aspects of language use in social interactions. One source of evidence that may be useful to address these issues would be expert clinician opinion. Other critical sources of evidence include the SLP's own understanding of a child's problem and past experience with specific intervention procedures. These sources of evidence, taken in accord with the child and family's view of the problem, may constitute the best solution currently available.

REFERENCES


## APPENDIX. LIST OF ELECTRONIC DATABASES AND SEARCH TERMS

<table>
<thead>
<tr>
<th>Electronic databases searched</th>
<th>Search terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>CINAHL</td>
<td>Positive behavioral support OR positive behavioral interventions and support OR PBS OR PBIS OR positive behav* support)</td>
</tr>
<tr>
<td>Cochrane Library</td>
<td>Parent intervention OR parent*</td>
</tr>
<tr>
<td>Communication and Mass Media Complete</td>
<td>Hanen OR (takes two to talk)</td>
</tr>
<tr>
<td>CSA Neuroscience Abstracts</td>
<td>Milieu teaching OR milieu</td>
</tr>
<tr>
<td>CSA Social Services Abstracts</td>
<td>Communicating Partners OR partner (?)</td>
</tr>
<tr>
<td>Education Abstracts</td>
<td>Peer mediation OR peer mediat*</td>
</tr>
<tr>
<td>ERIC</td>
<td>Conversation/Discourse interventions OR conversation OR discourse</td>
</tr>
<tr>
<td>Evidence-Based Medicine Guidelines</td>
<td>Pragmatic interventions OR pragmatic*</td>
</tr>
<tr>
<td>Health Source: Nursing</td>
<td>Social skills training OR social skills OR social competence (?)</td>
</tr>
<tr>
<td>High Wire Press</td>
<td>Applied Behavior Analysis OR ABA</td>
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<tr>
<td>Linguistics Language Behaviour Abstracts</td>
<td>Narrative interventions OR narrative-based language interventions OR NBLI OR narrative</td>
</tr>
<tr>
<td>National Library for Health</td>
<td>Responsivity training OR Pivotal Response Training</td>
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<tr>
<td>Psychology and Behavioral Sciences Collection</td>
<td>Communication OR communicating</td>
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<tr>
<td>PsyARTICLES</td>
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<td>Cognit*</td>
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<td>ScienceDirect</td>
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<td>Social Science Citation Index</td>
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<tr>
<td>SUMSearch</td>
<td>Mental retardation OR MR</td>
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<tr>
<td>TRIP Database</td>
<td>Semantic-Pragmatic disorder OR SPD</td>
</tr>
</tbody>
</table>

*Note.* Searches were also conducted on various combinations of the terms.
Teaching Social Skills to Children with Autism using Point-of-View Video Modeling

Allison Serra Tetreault
Dorothea C. Lerman

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For additional information about this article
http://muse.jhu.edu/journals/etc/summary/v033/33.3.tetreault.html
Teaching Social Skills to Children with Autism using Point-of-View Video Modeling

Allison Serra Tetreault and Dorothea C. Lerman
University of Houston – Clear Lake

Abstract

Video-modeling (VM) is a widely used instructional technique that has been applied to the education of children with developmental disabilities. One form of VM that lacks in-depth analysis is point-of-view video modeling (POVM). The current study investigated the use of POVM to teach three children diagnosed with autism to initiate and maintain a conversation with a conversant. Using a multiple baseline across scripts design, the participants were taught to engage in both eye contact and vocal behavior without the presentation of a vocal discriminative stimulus from the conversant. The treatment package included both the presentation of the target video and reinforcement of target behavior. Although this combination proved successful for increasing the social behavior of two participants, prompts were necessary to achieve acquisition for a third. These data suggest that while POVM may be a successful technique for teaching some social skills, limitations exist that should be further investigated.

The effective use of video modeling to help remediate the behavioral excesses and deficits of children with autism is well documented (Bellini & Akullian, 2007). This strategy has been shown to help establish a variety of skills, including those related to joint attention (e.g., LeBlanc et al., 2003), play (e.g., D’Ateno, Mangiapanello, & Taylor, 2003), self help (e.g., Shipley-Benamou, Lutzker & Taubman, 2002), academic instruction (e.g., Kinney, Vedora, & Stromer, 2003), communication (Wert & Neisworth, 2003), and community survival (e.g., Haring, Kennedy, Adams & Pitts-Conway, 1987). Additionally, video modeling is potentially more effective than teaching through in vivo modeling (Charlop-Christy, Le & Freeman, 2000), and can improve the effectiveness of instructional prompts (Murzynski & Bourret, 2007).

The use of videos to teach social skills has been examined in a recently expanding body of literature. The majority of studies investigating social skills instruction via video models, however, focused on relatively simple behaviors. For example, Bidwell and Rehfeldt (2004)
used video models and contingent praise to teach adults with severe disabilities to initiate an interaction by bringing a cup of coffee to an adult peer. Nikopoulos and Keenan (2004) demonstrated that video models alone were sufficient for teaching three children with autism to initiate an interaction by gesturing or vocally requesting an adult to join the child in play.

A few studies investigated video-based training for more complex social skills. Using video models alone, Maione and Mirenda (2006) obtained increases in the frequency of social initiations and responses of a young boy with autism during two different play contexts. The participant watched videos of two adults engaging in appropriate verbalizations and playing with the target activities. With the implementation of video modeling, the frequency of the participant's use of both scripted and unscripted verbalizations (including initiations and responses) increased during these play sessions. However, reinforcement, video feedback, and prompting were needed to increase behavior in a third play context. The authors reported that some of the modeled statements were novel, while others already existed in the child's repertoire. Charlop and Milstein (1989) showed that video models and reinforcement increased conversational responding for three children with autism. Prior to the intervention, each child exhibited utterances of three to four words in length. The children were taught scripted exchanges consisting of statements with up to eight words per utterance. Each scripted exchange involved an appropriate response to the conversant's question, followed by a reciprocal question to the conversant. While this target represents the most complex set of social behavior taught through video models to date, all of the exchanges were initiated by the conversant. Thus, further investigation of the utility of video models for teaching complex social skills, including those involving initiation of conversation in the appropriate context, is warranted.

Several authors suggest that video modeling is effective because it reduces the amount of irrelevant stimuli in the learning environment, increasing the likelihood that the participant will focus on the most relevant cues (Charlop-Christy et al, 2000; Krantz, MacDuff, Wadstrom, & McClannahan, 1991). If so, video formats that further reduce irrelevant stimuli may help promote learning. One format that may serve to reduce additional irrelevant stimuli in the learning environment is point-of-view modeling (POVM). In this type of modeling, the camera angle is presented at the participant's eye level and shows only what the participant might see within the context of the targeted activity, skill, or context (i.e., from his or her own viewpoint). Depending on the target skill, the participant might view a specific setting or a pair of hands completing a task.
One potential advantage of POVM over the typical, or scene view, video model is that it further restricts the stimuli to those that are directly related to the target behavior, eliminating the necessity of identifying optimal characteristics of the model (Hine & Wolery, 2006). The extent to which POVM has been utilized is unclear, however, because many prior studies did not include detailed descriptions of the video modeling procedures. To date, only four studies have explicitly evaluated the POVM technique (Alberto, Cihak, & Gama, 2005; Hine & Wolery, 2006; Schreibman, Whalen, & Stahmer, 2000; Shipley-Benamou et al., 2002) and these studies included a few specific procedural features in common while other features varied. For example, participants received prompts and praise for watching the video model in each case and some degree of generalization and maintenance of behavioral gains was observed in each study. However, many aspects of POVM differed across studies. For example, only Alberto et al. (2005) prompted rehearsal during video viewing and incorporated least-to-most prompts during post-viewing practice sessions. The delay between video viewing and practice opportunities was not specified in this study and in Schreibman et al. (2000), whereas practice occurred immediately after the presentation of the video in Shipley-Benamou et al. (2002) and Hine and Wolery (2006). Finally, participants received reinforcement for correct responding during practice sessions in some studies (e.g., Shipley–Benamou et al., 2002; Hine & Wolery, 2006) with no explicit mention in others.

The above investigations demonstrated the effectiveness of POVM for teaching self-help skills, play skills, and compliance with transitions. However, additional research is needed to determine the ease with which social and communication skills – two primary core deficit areas for children diagnosed with autism – may be acquired through this teaching approach. The purpose of the current study was to investigate the efficacy of POVM for teaching children with autism to initiate and maintain social interactions with others. The extent to which these skills generalized across materials and maintained over time also was evaluated.

Method

Participants

Participants were three children diagnosed with mild-moderate to severe autism by an independent psychologist. During the course of the study, all participants received behavior analytic services at a private center for 6 hours each day, 5 days per week. They lived at home with their parents and received various other therapies outside of the private center (e.g., occupational therapy, auditory integration
training, dietary supplementation). Each child’s language abilities and autism severity were assessed prior to the study using the Preschool Language Scale, Fourth Edition (PLS-4; Zimmerman, Steiner, & Pond, 2002) and the Childhood Autism Rating Scale (CARS; Schopler, Reichler, & Renner, 1988), respectively. Zhane was 5 years, 5 months at the time of the study and had attended the center for 2.5 years. His receptive language abilities were assessed to be the age-equivalent of 2 years, 3 months, and his expressive language abilities were 2 years, 9 months. Zhane’s autism severity score was 39, which falls in the severe range of symptomatology. Randall was 8 years, 2 months and had attended the center for 2 years, 3 months. His receptive language abilities were assessed to be the age-equivalent of 3 years, 4 months, and his expressive language abilities were 3 years, 1 month. Randall’s autism severity score was 35.5, which falls in the mild-moderate range of symptomatology. Janet was 4 years, 4 months and had attended the center for 10 months. Her receptive and expressive language abilities both were assessed to be the age-equivalent of 3 years, 10 months. Janet’s autism severity score was 32.5, which falls in the mild-moderate range of symptomatology. The children were selected for the study because they did not engage in spontaneous social initiations but could imitate three- to four-word sentences. None of the participants had exposure to video models as an instructional strategy prior to the study.

Setting and Stimulus Materials

All sessions were conducted in a small (2.4 m by 4.6 m) room at the day treatment center. The room contained a child-sized table and chairs, a filing cabinet, a bookcase, and a tripod-mounted video camera, as well as any materials relevant to the session (described below). During training sessions, a portable DVD player played the video of the designated script.

Three scripted sequences of social initiations were prepared (see sample script in Table 1). Each script focused on a different situation that would set the occasion for a social initiation by the participant. These activities were selected in consultation with the day treatment center supervisor and incorporated free-play items available during breaks from instructional time. Each script modeled on the video was associated with specific materials. The “Get Attention” script involved getting a conversant’s attention for the purpose of displaying a creation made with a marker and a dry erase board. The “Request Assistance” script was designed to teach a request for a conversant’s assistance in attaining and opening a clasped plastic box that contained a bottle of bubble solution. The “Share a Toy” script involved offering a Mr. Potatohead® doll to a conversant and then requesting it back.
again. In addition, two sets of generalization materials were selected for each script. The scripted statements were designed to allow for different materials to be presented in the situation. For example, the conversation created for “Share a Toy” could be used to offer and request any toy, not just the Mr. Potatohead® doll used in the video and practice sessions (see Table 1). The materials shown in each video clip and the materials used to evaluate generalization are listed in Table 2. Relevant materials were present in the baseline and post-viewing practice sessions for each target script.

Each video model began with a brief visual introduction (separate slides which showed “1”, “2”, “3”, “GO!”) followed by three repetitions of the target script. Subsequent to the first presentation, a brief visual transition (“READY!”, “GO!”) preceded the two consecutive presentations. The total durations for the “Get Attention”, “Request Assistance”, and “Share a Toy” videos were 2:21, 2:33, and 2:31, respectively. All camera angles on the video were shot from the first person perspective (i.e., POVMs) as illustrated in the Figure 1 screen shots that correspond with the script in Table 1. During filming, the camera was swiveled on the tripod to mimic natural head movements and brief (e.g., 2 s to 3 s) eye contact with the conversant, who was an unfamiliar graduate student. A female adult who was not in view (the first author) spoke the target verbalizations. Because of this person’s proximity to the camera, the participant’s lines were spoken more loudly than the conversant’s lines in the final videos. All videos were recorded in a location unfamiliar to the children.

Response Measurement and Reliability

All post-viewing practice sessions were videotaped for data collection purposes. During these sessions, the tripod and camera were placed in an unobtrusive position over the left shoulder of the conversant (i.e., the adult with whom the participant practiced the target skills) to adequately capture eye contact. Data were collected on the behavior in the target script, as well as on all of the children’s novel vocal behavior. All scripts were composed of five specific exchanges (see example in Table 1). For the purpose of this study, an exchange was defined as eye contact and vocal behavior from the child that occurred prior to the vocal behavior of the conversant. Each script began with a social initiation from the child in the form of a greeting (“Get Attention”: “Hi there!”; “Request Assistance”: “I’m glad to see you!”; “Share a Toy”: “Hey there!”). Correct and incorrect vocal behavior and eye contact were scored for each exchange. A correct vocal behavior was scored if the child said the exact sentence from the video or a sentence that differed by no more than two words (added or deleted)
Table 1
An Example Script: “Share a Toy”

<table>
<thead>
<tr>
<th>Exchange</th>
<th>Conversant</th>
<th>Participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>enters the room, looks at the participant</td>
<td>looks up from the toy, looks at the conversant</td>
</tr>
<tr>
<td>2</td>
<td>maintains eye contact, sits at the table</td>
<td>looks at the toy, looks at the conversant</td>
</tr>
<tr>
<td>3</td>
<td>looks at the toy, looks at the participant</td>
<td>looks at the toy, looks at the conversant</td>
</tr>
<tr>
<td>4</td>
<td>looks at the toy, looks at the participant</td>
<td>looks at the toy while the conversant plays, looks at the conversant</td>
</tr>
<tr>
<td>5</td>
<td>looks at the toy, looks at the participant</td>
<td>looks at the toy, plays with the toy, looks at conversant</td>
</tr>
</tbody>
</table>

from the target script (e.g., “Circle” instead of “It’s a circle.”). For the initial social exchange, any appropriate greeting (e.g., “Hi”, “Hello”, and the script examples above) said by the child was scored as correct regardless of the modeled greeting for that script. Correct eye contact was scored if the child looked at the conversant for any amount of time immediately prior to, during, or following (within 2 s) the target vocal behavior. These data were collected using pen-and-paper data sheets that listed the target vocal behavior for each exchange. Each sheet also included space to transcribe novel vocal behavior; however, no increases in appropriate novel language occurred for any of the children during treatment and therefore no data are presented for this measure. The number of exchanges consisting of both correct eye contact and vocal behavior was totaled for each post-viewing practice session. Data were collected during sessions by the experimenter and were verified by videotape at the end of each day.

A secondary observer collected data from video independently during 38%, 42%, and 43% of post-viewing practice sessions for
Zhane, Randall, and Janet, respectively. These data were compared for each instance of eye contact and vocal behavior during a session. An agreement was scored if both the primary and secondary observer mutually recorded the occurrence or nonoccurrence of a specific vocal or play target behavior. Interobserver agreement was calculated by dividing agreements by agreements plus disagreements and multiplying by 100. Across all subjects, scripts, and conditions, interobserver agreement averaged 93% (range, 70% to 100%). Observers also collected data on the conversant’s presentation of scripted statements to ensure integrity. Across all subjects, scripts, and conditions, accuracy of scripted conversant behavior averaged 99% (range, 80% to 100%). Data were not collected on other forms of conversant or experimenter behavior (e.g., reinforcer and prompt delivery).
Table 2  
Materials for Video-Model and Generalization Scripts  

<table>
<thead>
<tr>
<th>Video Model</th>
<th>“Get Attention”</th>
<th>“Request Assistance”</th>
<th>“Share a Toy”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dry erase board</td>
<td>Clasped plastic box</td>
<td>Mr. Potatohead®</td>
</tr>
<tr>
<td></td>
<td>Dry erase marker</td>
<td>Bottle of blowing bubbles</td>
<td></td>
</tr>
<tr>
<td>Generalization Set A</td>
<td>Playdoh®</td>
<td>Key-locked shape sorter</td>
<td>Plastic toy bus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bottle of blowing bubbles</td>
<td></td>
</tr>
<tr>
<td>Generalization Set B</td>
<td>Interlocking building blocks</td>
<td>Bottle of blowing bubbles</td>
<td>Plastic toy dragon</td>
</tr>
</tbody>
</table>

Note. For “Share a Toy”, generalization to a third and fourth toy were tested for Randall. Generalization Set C included a plastic toy dinosaur and Set D included a twirling toy.

Experimental Design and Procedure

The study employed a multiple baseline across behaviors (scripts) design. Initial script assignment was counterbalanced across participants. Each participant began treatment on one of the three scripts while baseline data were collected for the remaining two scripts. Probes for generalization to novel sets of materials were conducted throughout all baseline and treatment phases. Once a participant attained mastery on the first intervened-upon script (see below), treatment began on a subsequent script. Therapists from the treatment center acted as conversants and were randomly rotated throughout all conditions and across all participants. The adult presented in the video model was not employed by the day treatment center and was never present.

Baseline. During baseline sessions, the child sat at a table with the relevant stimulus materials for the target script. One adult conversant was present. The child was instructed that the conversant
would return shortly and that he or she should play nicely at the table until then. No video was presented. Within 20 s of exiting the treatment room, the conversant re-entered the room by knocking lightly on the door, stepping into the room, and closing the door behind her. The conversant performed each action and stated each assigned line within 10 s of the beginning of an exchange in the script (see Table 1), regardless of participant behavior. For example, if the participant did not respond within 10 s of the conversant entering the room, the conversant stated the scripted line of Exchange 1 and waited another 10 s for the participant to initiate the next exchange. This procedure ensured that each participant behavior could occur with equal opportunity in every session. No contingencies were programmed for eye contact or vocal behavior.

Video plus food. This treatment phase was conducted by one adult acting as the conversant and a second acting as the trainer (the first author) during video viewing and practice sessions. The trainer was responsible for setting up session materials, delivering reinforcers, and cueing the conversant (as described below). The trainer was constant across all treatment conditions for all participants.

The participant was seated at the table with the DVD player and the video model for the target script. The trainer sat behind the participant for the duration of the video viewing and the post-viewing practice session. Prior to beginning the video, the trainer stated, “Let’s watch a movie!” During viewing, reinforcement was periodically provided contingent on attention to the video model (i.e., every 10 to 15 s for eye contact with the television screen) using food items identified via a multiple-stimulus-without-replacement preference assessment (DeLeon & Iwata, 1996) conducted immediately before each training session. Immediately following the video viewing, the trainer initiated a post-training practice session by placing the relevant materials on the table and stating, “Let’s practice.” These sessions were identical to baseline with the following exceptions. Food items were delivered by the trainer contingent on scripted exchanges with the conversant (see Table 1). Immediately following the child’s scripted behavior, the conversant engaged in the scripted vocal response. If the child did not engage in any part of an exchange, the trainer cued the conversant when 10 s had elapsed by holding up the next written statement on an index card behind the participant and out of the participant’s view. A participant attained mastery if any 8 (out of 10) scripted eye contact and vocal behaviors occurred per session across three consecutive sessions. Under this criterion, a given trial might have included the vocal behavior without the eye contact, for example, and have been counted as one correct behavior (i.e., mastery was not based on the occurrence
of both correct behaviors on every exchange).

*Video only.* During this condition (Janet only), the video model was shown as described above and the adult roles were the same as described above, but no additional components of the treatment package were in effect. That is, no food reinforcers were delivered during video viewing or during the post-viewing practice session. During the video-plus-food condition, Janet began to orient towards the trainer instead of the conversant each time the conversant spoke suggesting that conversant statements became discriminative for the delivery of food reinforcers although they were only delivered contingent on correct participant behavior. Previous research using video models indicated that it was possible for some participants to acquire skills through video modeling without the inclusion of programmed reinforcer delivery (e.g., Charlop-Christy et al., 2000, see Krantz et al., 1991, for a review). Therefore, this condition was implemented to test for acquisition in the absence of arbitrary reinforcers, as well as to eliminate the strengthening of inappropriate stimulus control (i.e., looking for a food item each time the conversant spoke). Sessions were otherwise identical to those in the video-plus-food condition.

*Least-to-most prompts.* This phase was introduced to facilitation acquisition of the target behaviors for Janet after she did not meet the mastery criteria during prior conditions. These sessions were identical to video-plus-food sessions with the following alteration. If a correct vocal response did not occur within 10 s of an opportunity during post-viewing practice sessions, the trainer instituted a three-step least-to-most prompting procedure (Horner & Keillitz, 1975). First, the trainer provided a gesture prompt by pointing to the conversant. If the child did not engage in the vocal response within 2 s to 3 s, the trainer continued to provide a gesture prompt along with a partial verbal model of the beginning of the child’s scripted line (e.g., “I’m glad ...”). If the child did not engage in the target behavior within 2 s to 3 s, the trainer combined the gesture prompt with a full vocal model of the child’s scripted line (e.g., “I’m glad to see you”). In this phase, food items were delivered if behavior occurred independently or with only a partial model; edibles were not delivered if a full model was used. In a later repetition of this phase, the trainer was eliminated from the post-viewing practice session and the conversant delivered prompts and food items. This alteration was made because, as mentioned above, Janet began to attend to and engage with the trainer instead of the conversant. The mastery criteria were identical to those in the video-plus-food condition.

*Generalization.* Probes with the generalization materials were conducted throughout all conditions of the study using the procedures described in the baseline condition.
Maintenance. The procedures were identical to those in the baseline condition with a modification introduced for Randall and Janet after a decrement in responding was observed. Contingent food items were reintroduced to determine if this decrease in behavior was due to extinction effects (labeled “Food Only” on graphs). Sessions were identical to those in the video-plus-food condition except that the children did not watch the video prior to the practice session, and the trainer was not present during these sessions. Instead, the conversant delivered food items contingent on correct behavior.

Follow-up. Procedures were identical to those in baseline. Follow-up data were collected 10 days after the last maintenance session for Zhane only, as his rapid performance during treatment allowed for follow-up assessment during the study timeline.

Results

For each participant, two figures are presented with the first illustrating the number of correct (i.e., both eye contact and vocal behavior) exchanges in each session while the second depicts data on the occurrence of eye contact and scripted vocal behavior separately. Because either behavior could occur in the absence of the other on each exchange, the information presented in the second figure provides a more sensitive analysis of behavior over the course of intervention. Furthermore, the mastery criterion was based on the independent occurrence of eye contact and vocal behavior, regardless of whether they occurred together during the same exchange (i.e., any 8 of 10 behaviors across three consecutive sessions). However, data in the first figure also are important to evaluate because reinforcement was delivered contingent upon a fully correct exchange (i.e., both aspects correct for a given exchange).

Zhane’s performance is depicted in Figures 2 and 3. During the “Request Assistance” script (top graph of each figure), Zhane did not engage in any correct exchanges (Figure 2) during baseline with a gradual increase during the video-plus-food condition and mastery in 14 sessions. A return to the baseline condition during maintenance produced a brief decrease in exchanges with subsequent maintenance at or above the mastery criterion and skill maintenance at follow-up. No correct exchanges were observed during the generalization probes until the maintenance condition, and generalization sessions for both sets of stimuli met mastery levels during the follow-up condition. Figure 3 shows that eye contact occurred more frequently than vocal behavior in baseline. With the implementation of the video-plus-food condition, eye contact increased more rapidly than vocal behavior, and eye contact continued to occur at a higher frequency than vocal
Figure 2. Number of correct exchanges during baseline and treatment phases for Zhane. Open triangles represent generalization probes.
Figure 3. Number of correct eye contacts (closed circles) and scripted responses (open circles) during baseline and treatment phases for Zhane. (Generalization probes are not shown.)
responses during maintenance. For the “Share a Toy” script (middle graphs), no correct exchanges (Figure 2) occurred during baseline but increases occurred once treatment was implemented with mastery in 9 sessions. Correct exchanges continued during the maintenance and follow-up sessions. In the generalization probes, no correct responding occurred until treatment and the increases were not maintained during the maintenance and follow-up phases. Figure 3 illustrates that no correct vocal responses occurred during baseline, though eye contact did increase during baseline. The video-plus-food condition resulted in increases in both eye contact and vocal responses that maintained at approximately the same frequency during maintenance and follow-up. Similar results were obtained for the third script, “Get Attention” (bottom graphs), with the mastery criterion for exchanges (Figure 2) obtained in 6 sessions of intervention and maintained during maintenance and in follow-up. Eye contact and vocal behavior (Figure 3) increased simultaneously during intervention; however, little generalization to the novel materials was observed.

Randall’s performance is depicted in Figures 4 and 5. During the “Share a Toy” script (top graphs), Randall did not engage in any correct exchanges (Figure 4) during baseline, and there was no increase during the video-plus-food condition. Figure 5 shows that both eye contact and vocal responses occurred at baseline levels. However, Randall’s therapists at the day treatment center reported that he was using the scripted vocal behavior appropriately during his extra-experimental teaching sessions. It was hypothesized that the presentation of the video immediately before practice sessions may have created an abolishing operation for responding. Therefore, a baseline probe was conducted, during which Randall responded with all 10 of the modeled behaviors. Subsequent baseline sessions were conducted (labeled “Maintenance” on the figures), but there was a drastic decrease in correct exchanges after 4 sessions. Figure 5 shows that a decrease occurred for both eye contact and vocal behavior. Because a change from treatment to baseline conditions included the removal of both the video viewing component and the delivery of response-contingent food items, a food-only condition was initiated and correct exchanges met mastery in 4 sessions and responding continued in maintenance (only 2 sessions were conducted due to study timeline). Across all phases, Randall’s exchanges during generalization probes did not increase above baseline levels.

With the implementation of treatment for the “Request Assistance” script (middle graphs), correct exchanges gradually increased to mastery in 15 sessions and continued in maintenance, though generalization was limited (Figure 4). Eye contact increased during
baseline for this script when intervention began with the first script (Figure 5) and maintained with the introduction of video-plus-food condition, although both eye contact and vocal behavior continued at approximately the same frequency during maintenance. During baseline for the “Get Attention” script, correct exchanges never exceeded one (the initial greeting; Figure 4, bottom graph). With initiation of the video-plus-food condition, Randall’s responding reached mastery in 14 sessions and continued in maintenance, though little generalization occurred. Although eye contact increased during baseline with this script as well, the behavior decreased prior to the intervention. Similar increases in eye contact and vocal behavior occurred during the video-plus-food condition (Figure 5).

Data for Janet are displayed in Figure 6 and Figure 7. Janet’s baseline responding during the “Get Attention” script (top graphs) was at zero levels with little increase after 12 sessions in the video-plus-food condition. Both eye contact and scripted vocal behavior remained infrequent (Figure 7). Anecdotally, it was noted that Janet was attending more to the experimenter seated behind her (who provided the food reinforcers) than to the target conversant, although no eye contact or other forms of attention were delivered by the experimenter. To control for this behavior, the video-only phase was initiated after a return to baseline; however, correct exchanges did not increase (Figure 6) and both eye contact and vocal behavior decreased (Figure 7). The least-to-most-prompts condition was then implemented correct exchanges quickly increased with mastery in 10 sessions. Figure 7 shows that there was a more rapid increase in vocal responses than eye contact. However, an immediate decrease in exchanges occurred during a return to baseline. Because the video, prompts, and response-contingent food items had been removed, a food-only condition was introduced based on the assumption that the removal of reinforcement had extinguished correct responding. Nonetheless, correct exchanges did not increase under this condition. It was hypothesized that the decrease in exchanges during maintenance could instead have been due to the absence of the experimenter (who had previously delivered prompts). To establish stimulus control in the presence of the conversant alone, the conversant began to provide prompts in the next phase (labeled “Conversant Prompts” on the graph) and correct exchanges met mastery in 2 sessions with maintenance across 3 additional sessions. Figure 7 shows that both eye contact and scripted vocal responses increased concurrently. In the next phase, the prompts were removed while the delivery of response-contingent food items continued and Janet’s performance maintained. Across all phases, generalization to new stimuli did not occur.
Figure 4. Number of correct exchanges during baseline and treatment phases for Randall. Open triangles represent generalization probes (Sets A and B). Generalization Sets C and D of “Share a Toy” are represented by open diamonds and open squares respectively.
Figure 5. Number of correct eye contacts (closed circles) and scripted responses (open circles) during baseline and treatment phases for Randall. (Generalization probes are not shown.)
Figure 6. Number of correct exchanges during baseline and treatment phases for Janet. Open triangles represent generalization probes.
Figure 7. Number of correct eye contacts (closed circles) and scripted responses (open circles) during baseline and treatment phases for Janet. (Generalization probes are not included.)
Similar results were obtained for the “Request Assistance” script (middle graphs). Treatment began with the least-to-most-prompts condition, and correct exchanges reached mastery in 5 sessions. As with the first script, a food-only condition was introduced briefly, but behavior decreased to only one correct exchange immediately. Correct exchanges returned to mastery in 2 sessions and maintained across 3 additional sessions during the conversant-prompts condition, and maintained when prompts were removed in the following phase. Figure 7 shows that frequency of eye contact increased during baseline but decreased during the video-plus-food condition. As with the first script, vocal behavior increased more rapidly than eye contact when least-to-most prompts were introduced, but both behaviors occurred at approximately the same level during the conversant-prompts and food-only conditions. There was limited generalization across all conditions. With the implementation of the least-to-most-prompts condition for the “Share a Toy” script (bottom graphs), mastery was met in 6 sessions and correct exchanges continued in the conversant-prompts and food-only conditions, though no generalization occurred. It can be seen in Figure 7 that both eye contact and vocal behavior increased simultaneously with the implementation of treatment for this script.

Discussion

Results of this study are inconclusive regarding the overall effectiveness of POVM to teach social exchanges to children with autism. Responding on all three scripts came under the control of the video and reinforcement contingencies for 1 of the 3 participants (Zhane). For a second participant (Randall), two scripts were readily taught using the video modeling package intervention whereas an additional script required modification. For a third participant (Janet), response prompts were necessary to increase the frequency of eye contact and social initiations.

For all participants, eye contact appeared to generalize across baselines to some extent and was acquired and maintained somewhat more often than scripted vocal behavior (see Figures 3, 5 and 7). There are two likely explanations for these findings. First, the eye contact modeled in each video involved the same topography of shifting gaze from the materials to the person in all three scripts, while target vocal behavior was different in each case. Second, the action of eye contact (e.g., the motion of the camera) was clearly visible in the video model, whereas the scripted vocal responses were stated by a person not seen on the video which is a potential drawback of the POVM compared to a scene model. However, these findings were not robust, so further analysis of POVM for teaching various forms of social behavior should be investigated.
Although Zhane’s frequency of correct exchanges clearly increased with the introduction of treatment across all scripts, his behavior did not generalize to the materials used during probes for two of the three scripts. Randall’s response to treatment was perplexing. Anecdotal reports indicated that he had acquired the behavior shown in the video (i.e., saying lines from the script while engaging in eye contact), but it is not clear why he did not engage in these behaviors during post-viewing practice sessions for the first script. His mother reported that he frequently engaged in delayed echoing of lines from his favorite movies at home. However, it appeared that he did not generalize from the video model to the in-vivo practice session. The intervention was nonetheless effective with the other two scripts. For Janet, the video model and reinforcement alone were insufficient to increase correct exchanges and response prompts were necessary to increase her eye contact and vocal behavior. The obtained results suggested that Janet’s responding was at least partly controlled by the behavior of the experimenter, who during treatment delivered prompts and reinforcement for Janet’s exchanges with the conversant. However, the treatment components responsible for the increase in correct exchanges are unclear. Additional analyses comparing the efficacy of video modeling alone to the prompting procedure alone would provide more information about Janet’s acquisition of social behavior.

Although the general treatment effects were replicated across three scripts for each participant, few correct social exchanges occurred in the presence of materials that did not appear in the videos. For example, Zhane could talk about and share Mr. Potatohead®, but he did not do so with a toy bus or with a toy dragon. These results suggest that generalization is unlikely to occur if training is restricted to a single set of materials. However, the scripts were designed to be maximally different while including components of social referencing and verbal initiations. The “Get Attention” script involved showing off an item that the child had created (a drawing, a model built from Playdoh®, or a structure built from blocks), the “Request Assistance” script focused on requesting an out-of-reach item and assistance to open it (a clasped, screw-top, or locked container with bubbles visible inside), and the “Share a Toy” script was about sharing a toy and then requesting it back again (Mr. Potatohead®, a bus, or a dragon).

It is unclear why the current study failed to replicate the results of previous research on POVM. One possibility is our use of an off-screen modeled response (e.g., the scripted vocal statements), as mentioned above. When the intended model is not clearly visible on camera, as in the case of hands manipulating materials, the stimuli that should signal behavior may be more ambiguous. Another possibility
is the complexity of the social exchanges examined in this study. The current analysis selected target behaviors that have not been previously studied using POVM and that have rarely been studied with traditional video models. Participants not only were required to make brief eye contact with each social exchange, but they also were required to make a statement that was not dependent on the previous statement of another person (i.e., initiation of the interchange). It is possible that these skills would not have been acquired through traditional scene video modeling either. Further analysis of the usefulness of the POVM technique to teach social skills to children with autism is needed. An intermediary step between simple social skills (e.g., greetings) and more complex skills like those assessed here is warranted.

It would also be beneficial to determine which components of the present procedure were necessary to produce the desired results. For example, while a model and reinforcement were sufficient to change the behavior of one participant, these components were not entirely sufficient for another, and prompts were necessary for behavior change in a third. Also, it may have been unnecessary to include both a trainer and a conversant. From Janet’s results, one person may have sufficed to implement the intervention. A component analysis may help to identify the necessary ingredients for an effective video modeling treatment package. It is unclear to what extent the addition of an arbitrary reinforcer aided in the acquisition of target behavior. It is possible that the inclusion of highly preferred activities, assessed for each participant, may have made the social interaction itself more reinforcing and reduced the need for arbitrary reinforcers. Although not included in many other studies of video modeling, reinforcement was included here because of the unlikelihood that parity of behavior alone (i.e., similarity to a model) would have acted as a reinforcer (e.g., Horne & Erjavec, 2007). This assumption should be tested further with video modeling techniques.

Anecdotally, the intervention was associated with collateral decreases in self-stimulatory vocalizations in the post-viewing practice sessions for all children. During baseline sessions prior to treatment, both Zhane and Randall mumbled statements to themselves that were difficult for others to hear. Once treatment began, these responses did not occur in practice sessions, although they were noted in probes for generalization. Future studies should further analyze the potential relationship between video-viewing and verbal behavior that appears to be maintained by automatic reinforcement.

More research needs to be conducted to determine if POVM is limited in its capacity to teach these or other behaviors (e.g., academic, other expressive skills, other social behavior). Future investigations
should determine the characteristics of children who would be considered best responders to the point-of-view procedure or skills best suited to point-of-view perspective in models. Additionally, a comparative analysis should test the relative efficacy of traditional video modeling and POVM.

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