

Review

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

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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; Dollaghan, 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

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The charge of the committee was to develop an evidence-based systematic review (EBSR) of treatment for disorders of language use in social interactions.² 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 life span. Further, the committee decided to exclude children whose language performance falls below age-level expectations in the presence of sensory deficits (e.g., hearing loss), neurodevelopmental disorders (e.g., 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, Hartley, & 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; Liiva & 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

²The committee considered which umbrella term would best encompass the language problems of interest. The primary question was whether to use the most familiar term, pragmatics, or a broader term such as language use. Ultimately, the committee decided that language use in social interactions would provide the greatest breadth needed for the systematic review.

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 Brinton, Robinson, & Fujiki, 2004; Godfrey, Pring, & Gascoigne, 2005; Mentis, 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; Thiemann & 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) responsivity 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 LLDs 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 88% agreement. Based on the inclusion criteria, 14 studies were provisionally accepted. Before final inclusion into the EBSR, 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 EBSR.

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 blinding 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,

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 & Merrison, 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/allocation, treatment fidelity, significance, 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 1. Study design, quality indicators, research stage, and clinical question(s) addressed.

<i>Study</i>	<i>Design</i>	<i>Adequate protocol description</i>	<i>Assessor blinding</i>	<i>Random sampling described</i>	<i>Treatment fidelity</i>	<i>Significance</i>	<i>Practical Significance</i>	<i>Intention to treat (when applicable)</i>	<i>Quality indicator score</i>	<i>Research stage</i>	<i>Clinical question^a</i>
Adams (2001)	Case study	No	Yes	No	No	Yes	No	N/A	2	Exploratory	6,7
Adams, Lloyd, Aldred, & Baxendale (2006)	Case series	Yes	No	No	No	Yes	No	N/A	3	Exploratory	7
Bedrosian & Willis (1987)	Single subject	No	No	No	No	No	Yes	N/A	1	Exploratory	6
Dollaghan & Kaston (1986)	Single subject	Yes	No	No	No	No	No	N/A	1	Exploratory	6
Klecan-Aker (1993)	Case study	Yes	No	No	No	No	No	N/A	1	Exploratory	10
Merrison & Merrison (2005)	Group comparison	No	No	No	No	No	No	N/A	0	Exploratory	6
Richardson & Klecan-Aker (2000)	Pretest–posttest design	Yes	No	No	No	No	No	N/A	1	Exploratory	6
Swanson, Fey, Mills, & Hood (2005)	Case series	Yes	Yes	No	Yes	Yes	No	N/A	4	Exploratory	10

^aQuestion #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; Dollaghan & 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 (Dollaghan & 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 (Dollaghan & 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. 295), 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; Dollaghan & Kaston, 1986; Klecan-Aker, 1993; Merrison & Merrison, 2005; Swanson et al., 2005), metapragmatic discussion of behaviors (Adams et al., 2006; Bedrosian & Willis, 1987; Dollaghan & 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; Dollaghan & 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; Dollaghan & 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., Dollaghan & 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 (Dollaghan & Kaston, 1986; Merrison & Merrison, 2005). Changes in skills related to semantic and structural aspects of language were mixed:

Table 2 (p. 1 of 3). Aspects of the studies and their participants.

<i>Study</i>	<i>Population (diagnosis; age; grade; gender; race/ethnicity)</i>	<i>Diagnosis described/ Standardized tests used</i>	<i>Frequency/duration</i>	<i>Outcomes</i>	<i>Limitations</i>
Adams (2001)	PLI; <i>n</i> = 2; 7;3–10;3; NR; 2M; NR	Yes/Yes	3 × week/10 wks	Subject 1: Increase in relevant responses with decreases in inadequate/pragmatically problematic responses Subject 2: Increase in number of cohesive devices “Modest improvements” in use of conjunctions and grammatical structure; improvement in standard score on the Test of Word Finding	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
Adams et al. (2006)	PLI; <i>n</i> = 5; 6;0–9;11; NR; NR; NR	Yes/Yes	3 × week; 1-hr sessions/ 8 weeks	Decreases in conversational dominance, loquacity, verbosity, assertiveness, responsiveness, response problems, and pragmatic problems on a Conversation Assessment task Magnitude of effect is small; increases in the Assessment of Comprehension and Expression (ACE) Narrative and Inferential Comprehension subtests Increases in Clinical Evaluation of Language Fundamentals—Third Edition (CELF; Semel, Wiig, & Secord, 2000) Sentence Recall and Formulated Sentences subtests; positive parent and teacher perceptions of the therapy program and child needs	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
Bedrosian & Willis (1987)	SLI; <i>n</i> = 1; 5;0; K; 1M; NR	Yes/Yes	2 × week; 30-min sessions/ 6 months	Increases in the targets (i.e., memory-related and future-related topic initiations); frequency of “here and now” topic initiations remained stable	Small sample size; no normative information regarding what levels of initiation are expected for a child this age; no maintenance and generalization data
Dollaghan & Kaston (1986)	SLI; <i>n</i> = 4; 5;10–8;2 (<i>M</i> = 6.9); 1st; NR; NR	Yes/Yes	3 × week; 4–5 weeks	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	Small sample size; mixed expressive and receptive language profiles; control behavior was not included; no functional outcome measures used

(table continues)

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

<i>Study</i>	<i>Population (diagnosis; age; grade; gender; race/ethnicity)</i>	<i>Diagnosis described/ Standardized tests used</i>	<i>Frequency/duration</i>	<i>Outcomes</i>	<i>Limitations</i>
Klecan-Aker (1993)	LLI; $n = 1; 8; 8;$ 2nd; 1M; NR	Yes/Yes	2 × week; 1-hr sessions/ 12 weeks	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	Sample size limited to 1 participant; therefore, no replication opportunities or other experimental controls; no maintenance and generalization data
Merrison & Merrison (2005)	SLI-PLI-Normal controls; $n = 9; 7–11$ (M could not be calculated); UK years 1–3; 9M, 11F; NR; NR	Yes/Yes	1 × week; 6 weeks	PLI group initiated various repairs more frequently at completion of treatment (i.e., 78% post treatment vs. 0% pretreatment)	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

(table continues)

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

<i>Study</i>	<i>Population (diagnosis; age; grade; gender; race/ethnicity)</i>	<i>Diagnosis described/ Standardized tests used</i>	<i>Frequency/duration</i>	<i>Outcomes</i>	<i>Limitations</i>
Richardson & Klecan-Aker (2000)	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	Yes/Yes	Weekly; 30 min/6 weeks	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)	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
Swanson et al. (2005)	SLI; $n = 10$; 6;11–8;9 ($M = 7.10$); NR; 8M, 2F; NR	Yes/Yes	3 × week; 50 min/6 weeks	Eight of 10 children showed significant improvement ($p < .014$) 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	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)

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 & Klecan-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 continuous 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 & Klecan-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 interrater 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 clinic 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.

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APPENDIX. LIST OF ELECTRONIC DATABASES AND SEARCH TERMS

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

Note. Searches were also conducted on various combinations of the terms.

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

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located on the World Wide Web at:

<http://lshss.asha.org/cgi/content/full/43/2/235>



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