AJSLP

Review Article

A Scoping Review of the Involvement of Children's Communication Partners in Aided Augmentative and Alternative Communication Modeling Interventions

Elizabeth E. Biggs,[a] Erik W. Carter,[b] and Carly B. Gilson[c]

Purpose: The purpose of this study was to inform practice and research by identifying and synthesizing research on interventions in which natural communication partners implemented aided augmentative and alternative communication (AAC) modeling strategies.
Method: A scoping review yielded 29 studies. Data were charted related to participant characteristics, intervention characteristics, partner instruction and assessment, and partner perspectives of social validity.
Results: More than 157 peer and 100 adult communication partners (e.g., parents, special educators, paraprofessionals) implemented aided AAC modeling strategies within included studies. To teach communication partners intervention strategies, researchers frequently reported using (a) oral instruction, (b) modeling, and (c) practice or application opportunities with performance feedback. Partner instruction frequently involved both training and concurrent support (e.g., coaching, facilitation, consultation, follow-up support).
Conclusion: Findings from this review inform the design and delivery of aided AAC modeling interventions by children's natural communication partners. Findings also highlight important avenues for enhancing the rigor of future research on interventions involving aided AAC modeling, including the quality of reporting and application of principles from implementation science.
Supplemental Material: https://doi.org/10.23641/asha.8038505

Communication is a fundamental need and right for all people. However, many children with intellectual and developmental disabilities have complex communication needs and experience challenges developing effective and efficient communication. Often, these children benefit from learning to use aided augmentative and alternative communication (AAC)—such as communication books or speech-generating devices (SGDs)—to supplement or replace the use of speech.

Prior research has identified a range of effective strategies and interventions to promote the communication skills of children with intellectual and developmental disabilities learning to use aided AAC (e.g., Snell et al., 2010). One such strategy involves natural communication partners such as parents, teachers, paraprofessionals, or peers modeling the use of an AAC device (Binger & Light, 2007; Drager, 2009; Romski & Sevcik, 1996). Research indicates interventions involving aided AAC modeling promote meaningful growth in children's receptive and expressive vocabulary, pragmatics, and expressive syntax (Allen, Schlosser, Brock, & Shane, 2017; Biggs, Carter, & Gilson, 2018). When communication partners model aided AAC, it can help children make connections between spoken words, graphic symbols on the AAC system, and their referents (Drager, 2009). Furthermore, aided AAC modeling demonstrates the AAC device is an encouraged mode of communication and cues children to also use it expressively (Romski & Sevcik, 1996).

Different forms of aided AAC models likely serve different functions in improving children's communication skills. First, communication partners may use aided AAC with the primary focus of augmenting (i.e., supplementing) their spoken communication input for a child. When the primary focus of aided AAC modeling is augmenting input, children are not expected or required to respond immediately.

[a]Department of Special Education, University of Illinois at Urbana-Champaign
[b]Department of Special Education, Vanderbilt University, Nashville, TN
[c]Department of Educational Psychology, Texas A & M University, College Station
Correspondence to Elizabeth E. Biggs: eebiggs@illinois.edu

Editor-in-Chief: Julie Barkmeier-Kraemer
Editor: Erinn Finke
Received January 25, 2018
Revision received June 18, 2018
Accepted November 13, 2018
https://doi.org/10.1044/2018_AJSLP-18-0024

Disclosure: *The authors have declared that no competing interests existed at the time of publication.*

Instead, communication partners use aided AAC as a part of their own "voice" during their ongoing, natural interactions. This practice is referred to using a variety of terms, including augmented input, aided language stimulation, and aided language modeling (e.g., Drager, 2009; Romski & Sevcik, 1996). Another way communication partners model aided AAC is with the primary goal of directly encouraging or eliciting a response from the child through models functioning as prompts (Biggs et al., 2018). A third form of modeling involves a communication partner demonstrating the use of aided AAC during a set, episodic time, often as an introduction or to highlight target vocabulary or grammatical forms (e.g., Schepis, Reid, Behrmann, & Sutton, 1998). Biggs et al. described this form of aided AAC modeling as occurring "within instructional demonstrations" (pp. 444).

Three recent systematic reviews evaluated research on the effectiveness of aided AAC modeling interventions. Sennott, Light, and McNaughton (2016) conducted a best evidence synthesis of 10 studies and concluded that naturalistic aided AAC modeling interventions led to meaningful communication gains in areas of pragmatics, semantics, syntax, and morphology. Allen et al. (2017) conducted a systematic review of 19 studies and found that augmented input interventions improved receptive and expressive single-word vocabulary skills, as well as expression of multisymbol utterances. In a broader review, Biggs et al. (2018) categorized interventions in 48 studies according to three approaches to aided AAC modeling—augmented input, as prompts, and within instructional demonstrations. Notably, nearly one third of studies (29%) involved interventions that combined modeling approaches, such as augmented input and models as prompts. Findings indicated interventions involving each of these distinct but related forms of aided AAC modeling improved expressive communication outcomes. Although Biggs et al. found only five studies focused solely on aided AAC modeling, other findings indicated modeling was a salient component in packaged interventions.

The effectiveness of aided AAC modeling interventions to improve outcomes in practice depends on children's natural communication partners implementing them well. Researchers consistently emphasize the importance of communication partner instruction for children with complex communication needs and advocate for giving more attention to partner roles, training, and evaluation within the empirical literature (Kent-Walsh & McNaughton, 2005; Kent-Walsh, Murza, Malani, & Binger, 2015). Natural communication partners hold critical places in children's lives; however, they may not intuitively know how to support the interaction of children learning to use aided AAC. Although they have numerous opportunities to promote communication development within natural environments, communication partners often do not use effective strategies such as aided AAC modeling without being trained and encouraged to do so (Romski & Sevcik, 1996; Smith & Grove, 2003). However, research demonstrates (a) natural communication partners can be taught to use intervention strategies with fidelity and (b) their use of these strategies is associated with improvements in children's language and communication (e.g., Kent-Walsh, Murza, et al., 2015; Roberts & Kaiser, 2011).

Researchers have used many different techniques to teach natural communication partners to use intervention strategies. For example, Lang, Machalicek, Rispoli, and Regester (2009) reviewed procedures used to teach parents to implement communication interventions with their children with autism. They reported the most frequently used instructional strategies were (a) verbal instruction and/or manuals, (b) applied practice, (c) role playing, (d) modeling, and (e) reviewing videos of intervention sessions. An increasing amount of research has highlighted the importance of coaching and related types of support, rather than standalone training without additional feedback (Brock et al., 2017; Kent-Walsh, Murza, et al., 2015). For example, Kaminski, Valle, Filene, and Boyle (2008) conducted a meta-analysis of parent training programs and found that the implementation practice associated with the greatest effectiveness was providing feedback while parents applied intervention strategies with their children. Other researchers have drawn similar conclusions on the importance of coaching and related follow-up support for teachers and paraprofessionals (Brock et al., 2017; Kretlow & Bartholomew, 2010).

Knowing more about the roles of peer and adult partners in aided AAC modeling interventions—and the instruction that may help them learn to model AAC effectively—could ultimately influence the quality with and extent to which interventions are adopted in practice. Understanding the use of intervention strategies by natural communication partners can be pursued through the lens of implementation science—a burgeoning field of research focused on understanding the practices and conditions that promote or impede the use of evidence-based interventions (Dunst, Trivette, & Raab, 2013; Fixsen, Naoom, Blasé, Friedman, & Wallace, 2005). Implementation science differentiates between two types of practices. *Implementation practices* refer to the procedures used to support natural change agents to implement an intervention (e.g., the practices comprising communication partner instruction). *Intervention practices* refer to the actual strategies and components that make up the intervention (e.g., communication partners' use of strategies comprising aided AAC modeling interventions). The field of implementation science also highlights the critical role of fidelity at implementation and intervention levels because both impact child outcomes (Dunst et al., 2013).

We used an implementation science perspective to conduct a scoping review focused on the roles, characteristics, instruction, and assessment of natural communication partners who participate in implementing aided AAC modeling interventions. We focused on the involvement of communication partners in the delivery of aided AAC modeling interventions rather than study quality or intervention effectiveness, as efficacy has been addressed in other reviews (Allen et al., 2017; Biggs et al., 2018; Sennott et al., 2016). We chose scoping review methodology because it was well suited for our goals, which were (a) to map the existing literature base, (b) to provide insight into the ways communication partners have been trained and supported,

(c) to identify gaps and needs in this literature, and (d) to highlight pathways for future research. A scoping review is a form of exploratory knowledge synthesis to inform practice and future research by providing an overview or "lay of the land" (Colquhoun et al., 2014, p. 1292) of a defined area or field. Although scoping reviews share a number of characteristics with systematic reviews, there are some differences. Scoping reviews typically involve broad research questions that are used to identify parameters and gaps in a body of literature (Armstrong, Hall, Doyle, & Waters, 2011; Colquhoun et al., 2014). Conducting a scoping review involves identifying the research question, identifying relevant studies, selecting studies, charting the data (i.e., extracting or coding data), and analyzing and reporting the results (Arksey & O'Malley, 2005; Colquhoun et al., 2014). The central question guiding our scoping review was: What is the nature of published experimental literature on aided AAC modeling interventions implemented—in part or in whole—by natural communication partners? We were particularly interested in gleaning information about the (a) characteristics of communication partners who have implemented aided AAC modeling interventions, (b) strategies partners used within these interventions, (c) intervention contexts and settings, (d) implementation practices used to train and support communication partners, (e) methods researchers used to evaluate partners' use of intervention strategies, and (f) partners' perspectives related to social validity (e.g., importance and acceptance of intervention goals, procedures, outcomes).

Method

Inclusion Criteria

We included studies meeting five criteria. First, studies evaluated an intervention involving a natural communication partner modeling aided AAC. We defined a natural communication partner as anyone who might interact with a child or be in the natural environment had the study not been implemented (e.g., an educator, a parent, or a peer). This excluded studies with interventions implemented only by members of a research team. Second, studies used either experimental single-case or group design. This excluded nonexperimental and quasi-experimental studies such as pre–post designs and single-case designs with fewer than three opportunities for the demonstration of an effect. Third, participants were children or young adults (i.e., 21 years old or under) with complex communication needs who used aided AAC, which excluded studies focused on adults over 21 years of age, children only using unaided AAC, and typically developing children. Studies could meet the criterion for participants when (a) half of participants had these characteristics or (b) there were three possible demonstrations of effect for participants with these characteristics within a single-case design. Fourth, studies experimentally measured at least one outcome related to the child's expressive communication. Fifth, studies were published in English in a peer-reviewed journal.

Identifying and Selecting Studies

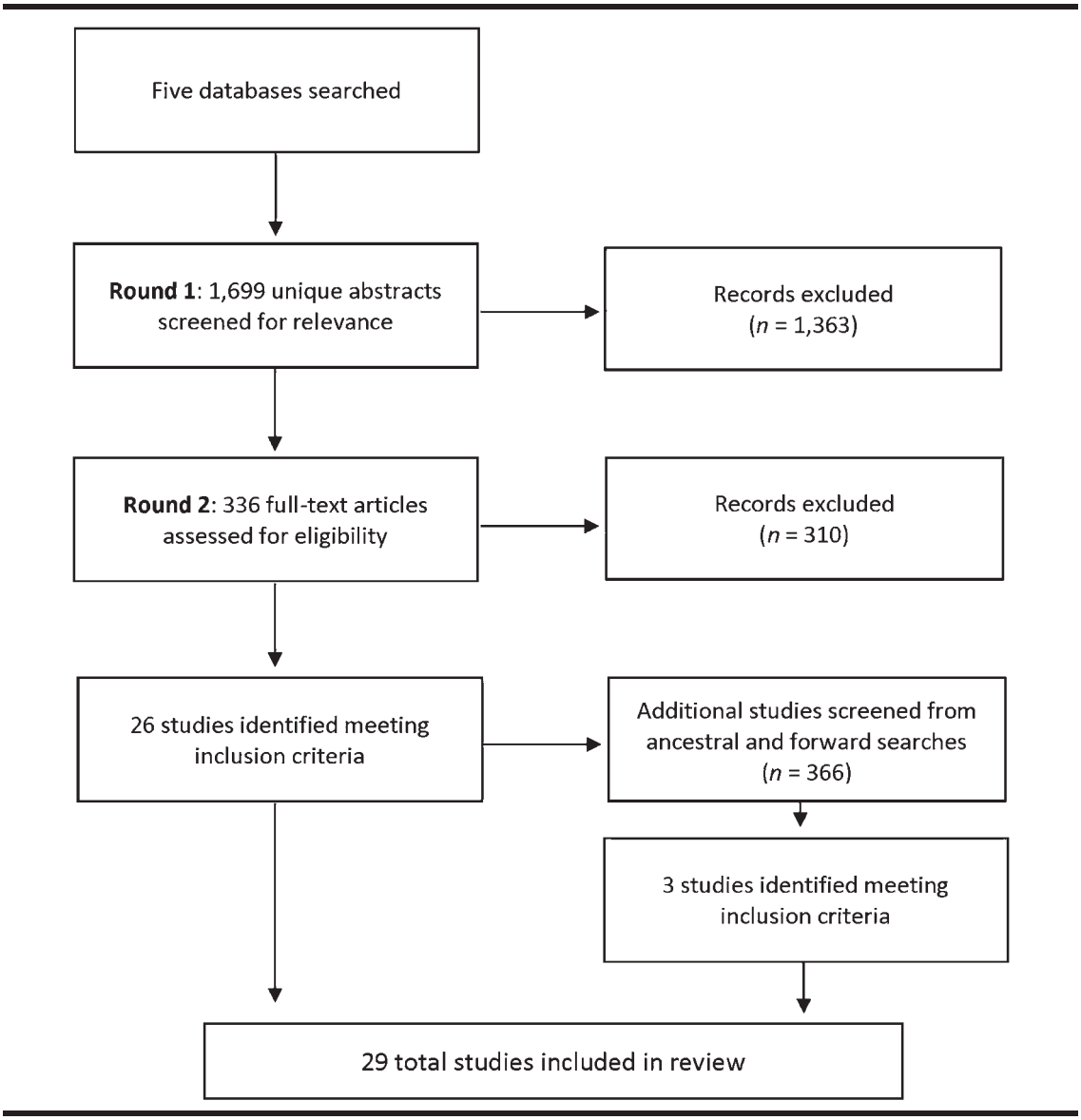
We used two methods to identify studies. First, we searched for studies published in print or available online before May 2018 using five electronic databases (i.e., Communication and Mass Media Complete, Education Full Text, ERIC, Linguistics and Language Behavior Abstracts, and PsycINFO). We used a string search exhausting different combinations of key words describing (a) outcomes, (b) aided AAC types, and (c) study design to identify all potentially relevant articles (i.e., [AAC OR communication OR interaction OR language OR production] AND ["aided communication" OR "aided language" OR "alternative communication" OR "augmentative communication OR "communication board" OR "communication book" OR "communication device" OR "language board" OR "graphic symbol" OR "picture communication" OR "picture exchange" OR "speech generating device" OR "voice output communication"] AND [effect OR efficacy OR experiment* OR impact OR "group design" OR randomize* OR "single subject" OR "single case" OR "multiple baseline" OR "multiple probe"]). Second, we applied ancestral and forward searches to identify other potentially relevant articles.

As depicted in Figure 1, the initial search produced 1,699 unique citations. The first author was the primary rater during two rounds of screening. The first round involved examining the title and abstract to retain studies evaluating interventions designed to promote the communication of children with disabilities. A study was excluded only when the abstract clearly indicated it failed to meet one or more of the specified inclusion criteria (e.g., nonintervention research). The number of potentially relevant studies was reduced to 336 after this screening. The full text of retained articles was reviewed during a second screening, which resulted in identifying 26 studies meeting all criteria. As a final step, the first author used the same procedures to review 366 additional citations from ancestral and forward searches, which resulted in the identification of three additional studies. Thus, 29 studies were included in the review. A second rater (i.e., doctoral-level graduate student) independently screened a minimum of 20% of abstracts in the first round (n = 340) and full-text articles in the second round (n = 68). We calculated interrater reliability by taking the number of agreements divided by the number of agreements plus disagreements, multiplied by 100%. Results indicated high agreement between the two raters, with 98.8% reliability in the first round of screening and 97.1% in the second round. We resolved disagreements through discussion and consensus.

Charting the Data

We extracted data from each study related to participant characteristics, study design and intervention characteristics, partner instruction and assessment, and social validity using a detailed coding protocol (full coding protocol is available as Supplemental Material S1). To evaluate

Figure 1. Flow chart depicting the identification of studies.



the quality of reporting, we coded a variable as unclear if information was not reported.

Participant Characteristics

For each participant meeting criteria for this review, we recorded the child's age and primary disability using categories adapted from the Individuals with Disabilities Education Improvement Act (2004): autism, developmental delay (i.e., 9 years of age or younger with reported developmental delays but no other disability label), orthopedic impairment, multiple disabilities, intellectual disability (i.e., without a diagnosis of autism or orthopedic impairment), and other communication disorder (i.e., speech or language disorder not reported to result from another disability). We coded the number of each of the following types of natural partners who modeled aided AAC within an intervention: peers, paraprofessionals, parents, special educators, and other adult partners. When more than one type of partner applied (e.g., peers and paraprofessionals), we recorded the number of each type. For each partner, we coded sex, race/ethnicity, and age or education level. Age levels for peer partners included preschool aged (i.e., 5 years of age or less), elementary aged (i.e., kindergarten through fifth grade or 6–11 years of age), and secondary aged (i.e., sixth through 12th grade or 12–18 years of age). For adult partners, we coded their highest level of education (i.e., some high school, high school graduate, some college, bachelors, and graduate degree). We also recorded if any researchers directly implemented the intervention alongside the natural partners.

Design and Intervention Characteristics

We recorded whether studies used experimental group design or single-case design. We also coded whether studies were demonstration studies, comparative studies, or component analyses. We used definitions from Biggs et al. (2018) to describe the form of aided AAC modeling as augmented input, models as prompts, and/or within instructional demonstrations (see Supplemental Material S1 for definitions). When studies involved an intervention combining two forms of modeling, we coded both types. We also coded the type of AAC as an SGD or a non-SGD and listed all other intervention strategies used by communication partners in the intervention. We coded the location of the intervention as one or more of the following settings: home, school, a university/private clinic, in the community (e.g., job site), or unclear. We described the specific activity or context of each intervention (e.g., shared reading, interactive play) and determined whether it was naturalistic (i.e., occurring within the same activities/settings and with the same partners as a child's regular routine). To evaluate the extent to which interventions occurred in inclusive settings, we coded whether peers without disabilities were present.

Partner Instruction and Assessment

We coded whether partner instruction involved preintervention training, concurrent support, or both. *Preintervention training* was any teaching or training sessions that occurred prior to the start of a partner's implementation of the intervention with a child. *Concurrent support* was any teaching or support occurring during part or all of the course of the intervention (e.g., coaching, consultation, facilitation, or follow-up support). When instruction involved preintervention training, we coded training length as the total number of minutes, using the mean if lengths differed across participants. We recorded all instructional strategies used to teach partners using a list of defined possibilities with the option to write other strategies (see Table 1 for definitions).

Related to the assessment of partners' intervention-related behaviors, we adopted terminology from the field of implementation science to record information about two levels of fidelity (Dunst et al., 2013; Fixsen et al., 2005). *Implementation fidelity* was defined as assessment of adherence to the procedures described to instruct partners. *Intervention fidelity* was defined as assessment of partners' use of intervention strategies with participating children. When intervention fidelity was reported, we described when it occurred (i.e., which study conditions) and how it was conducted (i.e., checklist or counted and graphed data). We also recorded if studies reported a training criterion assessment for partners prior to the intervention (e.g., 80% accuracy using a checklist during role play with the researcher).

Social Validity

We coded whether researchers solicited perspectives of social validity through interviews and/or questionnaires and whether they addressed the goals, procedures, and/or outcomes of the intervention, and/or the instruction partners received.

Interrater Reliability

The first author coded all studies, and a second rater (i.e., doctoral-level graduate student) independently coded a random sample of 20.7% of studies (n = 6). Because our coding protocol included a combination of numerical and categorical variables, including many with nonmutually exclusive coding options, we established the stringent criterion that coders must agree on all individual coding options to count as an agreement. Across individual variables, interrater reliability averaged 96.4% (range: 83.3%–100.0%). Coders discussed all disagreements to reach consensus, and the resulting data were used in final analyses.

Results

Within the 29 included studies, 134 children participated who ranged in age from 2 to 21 years (see Table 2 for a summary of each study). Nearly half of the studies (44.8%) focused on early childhood-aged participants, and the largest number of participating children had autism (n = 55, 41.0%). Other children had developmental delay (22.4%), intellectual disability (14.9%), multiple disabilities (11.9%), orthopedic impairment (6.0%), and other communication disorders (e.g., childhood apraxia of speech, 3.7%). Only two studies (i.e., Kasari et al., 2014; Romski et al., 2010) used group designs; the remaining 27 used experimental single-case designs.

What Are the Characteristics of Partners Who Participated?

Across studies, aided AAC modeling interventions were implemented by peer partners and a range of different adult partners (e.g., parents, school staff).

Peer Partners

More than 157 peers implemented interventions in 12 studies. One study involved elementary-aged peers, six involved preschool-aged peers, and five involved secondary-aged peers (see Table 3). Few studies directly reported peers' sex and race/ethnicity (i.e., Chung & Carter, 2013; Hughes et al., 2000; Therrien & Light, 2016, 2018).

Adult Partners

More than 100 adults implemented interventions in 20 studies. The majority of adult communication partners were parents (n = 68). Paraprofessionals, special educators, speech-language pathologists (SLPs)/AAC specialists, and other adult partners (e.g., respite worker, administrator) also participated (see Tables 2 and 3). Reporting of demographic characteristics was limited—eight studies reported sex (21 females, nine males), three reported race/ethnicity, and six reported the highest level of education (ranging from high school to graduate degree).

Table 1. Instructional strategies comprising partner instruction.

Strategy name	Abbreviated definition	Peers *n* = 12	Adults *n* = 20	Any partner[a] *n* = 29
Oral instruction	The instructor gave instruction orally, such as to explain intervention strategies or share information about the child with a disability or the AAC device.	100.0	100.0	100.0
Model strategies	The instructor demonstrated or modeled intervention strategies for the partner.	90.0	91.7	95.0
Authentic application with feedback	The instructor gave prompting, feedback, and/or other support while partners applied intervention strategies directly with the child with a disability.	80.0	75.0	80.0
Role play or rehearsal	The instructor gave opportunities for partners to practice and apply intervention strategies in hypothetical contexts, such as through role play or application to a case example.	50.0	75.0	65.0
Final assessment	The instructor gave partners a final assessment of their knowledge or skills before beginning the intervention.	10.0	58.3	40.0
Printed materials	The instructor presented information in a printed or written form, such as through a handout, binder, or slides.	40.0	50.0	50.0
Discussion	The instructor provided time for discussion and/or for partners to ask questions.	30.0	33.3	35.0
Explain rationale	The instructor explained the rationale for the intervention strategies and/or used another method to solicit the commitment of the partner to use the strategies.	10.0	33.3	25.0
Memory tool	The instructor provided a verbal memory tool (e.g., mnemonic) to help partners remember the sequential steps of an intervention strategy.	20.0	16.7	20.0
Pretest	The instructor gave partners a pretest to assess prior knowledge before beginning instruction.	0.0	25.0	15.0
Individualized plan	The instructor worked with partners to create or review an individualized plan for implementing strategies in a specific context or with an individual child.	10.0	8.3	10.0
Self-reflection	The instruction included a self-evaluation tool to promote partners' reflection on their development of skills and knowledge related to the intervention.	0.0	8.3	5.0
Not reported (*n*)[b]		2	8	9

Note. The table reports percentage of studies reporting each partner role or instructional strategy. AAC = augmentative and alternative communication.

[a]Three studies involved both adult and peer communication partners implementing parts of the intervention. [b]Percentages for instructional strategies are calculated out of the number of studies reporting implementation procedures comprising partner instruction.

What Strategies Have Partners Used Within Aided AAC Modeling Interventions?

We analyzed the extent to which communication partners across studies used three forms of aided AAC modeling—as augmented input, as prompts, and within instructional demonstrations (Biggs et al., 2018; see Supplemental Material S1 for definitions). Figure 2 provides a graphic depiction of which studies involved communication partners using each form of aided AAC modeling. The interventions in six studies (i.e., Binger, Kent-Walsh, Berens, Del Campo, & Rivera, 2008; Binger, Kent-Walsh, Ewing, & Taylor, 2010; Heller, Allgood, Davis, et al., 1996; Heller, Allgood, Davis, Arnold, Castelle, & Taber, 1996; Heller, Ware, Allgood, & Castelle, 1994; Kent-Walsh, Binger, & Hasham, 2010) involved combining different forms of aided AAC modeling. For example, Binger et al. (2008, 2010) and Kent-Walsh et al. (2010) evaluated parent- and paraprofessional-implemented interventions that involved aided AAC modeling within a least-to-most cueing hierarchy and as augmented input through aided recasts and expansions. Across all studies, partners provided augmented input in 19 studies (65.6%), models as prompts in 13 (44.8%), and models within instructional demonstrations in four (13.8%; percentages add to more than 100% because of interventions with combined forms of modeling).

We found patterns in the forms of modeling used by different communication partners. Peers and parents were more likely to provide augmented input than other forms of modeling. Peers provided augmented input in 75.0% of interventions, compared to models as prompts (16.7%) and within instructional demonstrations (8.3%). Parents provided augmented input in 71.4% of interventions, compared to models as prompts (42.9%) and within instructional demonstrations (14.3%; percentages add to more than 100% because of interventions with combined forms of modeling). However, the majority of interventions implemented by school staff (e.g., teachers, paraprofessionals) involved models as prompts (71.4%). Communication partners also used a number of other intervention strategies. Both adult and peer communication partners were often reported to use expectant/time delay, open-ended questions, and other conversational strategies (e.g., turn-taking). Adult partners also used environmental arrangements to create communication opportunities (e.g., placing desired objects out of reach) and provided systematic prompting and reinforcement.

In What Settings Did Interventions Take Place?

Most interventions (82.8%) occurred in schools, but interventions also occurred in community settings (20.7%), homes (17.2%), and private or university-based clinics

Table 2. Evidence map of the involvement of communication partners in aided AAC modeling interventions.

Study	Participants/*AAC*	Partners	Setting/*activity*	Partner instruction	Partner assessment
Early childhood-aged (birth to 5 years)					
Augmented input					
Romski et al. (2010)[a]	21 with DD *SGD*	21 parents	Home/clinic (N) *Play, shared reading, snack*	Oral instruction, modeling, authentic application, printed materials, discussion (T + S)	Fidelity checklist (I)
Solomon-Rice & Soto (2014)	3 with DD *SGD*	2 SLPs	Clinic *Play-based therapy*	NR	Checklist (B/I)
Therrien & Light (2016)	2 with DD *SGD*	6 peers[b]	School *Storybook reading*	Oral instruction, modeling, authentic application, final assessment (S)	Criterion assessment
Therrien & Light (2018)	5 with ASD or DD *SGD*	5 peers[b]	School *Storybook reading*	Oral instruction, modeling, authentic application (S)	Graphed data (B/I)
Thiemann-Bourque et al. (2016)	4 with ASD *Non-SGD*	7 peers[b]	School (N) *Centers, art, snack*	Oral instruction, modeling, role play/rehearsal, authentic application, printed materials, memory tool, discussion (T + S)	Graphed data (B/I)
Thiemann-Bourque et al. (2017)	3 with ASD *SGD*	3 peers[b]	School (N) *Play, art, table activities*	Oral instruction, modeling, role play/rehearsal, authentic application, printed materials, memory tool, discussion (T + S)	Graphed data (B/I)
Aided AAC models as prompts					
Johnston, Nelson, et al. (2003)	3 with ASD *Non-SGD*	12 peers 4 paras 1 teacher	School (N) *Play centers*	Paras/teacher: oral instruction, role play/rehearsal (T) Peers: oral instruction (T)	Criterion assessment (paras/teacher only)
Johnston, McDonnell, et al. (2003)	3 with DD, OI, or MD *SGD/non-SGD*	52 peers[b]	School (N) *Play, snack, music*	NR	NR
Aided AAC models within instructional demonstrations					
Kent-Walsh, Binger, et al. (2015)	3 with ID or CD *SGD*	3 parents[b]	Clinic *Play-based therapy*	NR	Checklist (I)
Schepis et al. (1998)	4 with ASD *SGD*	3 paras 1 teacher	School (N) *Play and snack*	Oral instruction, modeling, printed materials, discussion (T)	NR
Combined forms of aided AAC modeling					
Binger et al. (2008)	3 with CD *SGD/non-SGD*	3 parents	Home (N) *Shared reading*	Pretest, oral instruction, rationale, modeling, role play/rehearsal, authentic application, printed materials, memory tool, final assessment (T)	Criterion assessment Graphed data (B/I)
Binger et al. (2010)	3 with OI or DD *SGD*	3 paras	School *Shared reading*	Pretest, oral instruction, rationale, modeling, role play/rehearsal, authentic application, printed materials, memory tool, final assessment (T)	Criterion assessment Graphed data (B/I)
Kent-Walsh et al. (2010)	6 with OI or ID *SGD/non-SGD*	6 parents	Home (N) *Shared reading*	Pretest, oral instruction, rationale, modeling, discussion, role play/rehearsal, authentic application, final assessment (T)	Criterion assessment Checklist (B/I)

(*table continues*)

Table 2. *(Continued).*

Study	Participants/*AAC*	Partners	Setting/*activity*	Partner instruction	Partner assessment
Elementary aged (6–11 years)					
Augmented input					
Hunt et al. (1991b)	3 with ID *Non-SGD*	Peers (#NR)[b]	School *Conversation opportunities*	Oral instruction, modeling, role play/rehearsal, authentic application (T + S)	NR
Kasari et al. (2014)[a]	31 with ASD *SGD*	31 parents[b]	Clinic *Play-based therapy*	Oral instruction, modeling, authentic application (T + S)	Checklist (I)
Aided AAC models as prompts					
Johnson et al. (2004)	1 with ASD *SGD*	1 para	School (N) *Classroom activities*	Oral instruction, modeling, role play/rehearsal, authentic application, printed materials, final assessment (T)	Criterion assessment Checklist (I)
McMillan & Renzaglia (2014a, 2014b)	4 with ASD *SGD*	4 teachers	School (N) *Classroom activities*	Oral instruction, modeling, individualized plan, discussion, role play/rehearsal, authentic application, printed materials, final assessment (T + S)	Criterion assessment Graphed data (B/I)
Secondary aged (12–17 years)					
Augmented input					
Ballin et al. (2012, 2013)	2 with OI or MD *SGD*	2 mentors (i.e., experienced AAC users)	Community *Social Conversations*	Oral instruction, rationale, modeling, role play/rehearsal, authentic application, final assessment, self-reflection tool (T + C)	Criterion assessment Graphed data (B/I)
Chung & Carter (2013)	2 with ID *SGD*	7 peers	School (N) *Classroom activities*	Oral instruction, rationale, modeling, individualized plan, printed materials, authentic application (T + S)	Checklist (B/I)
Hunt et al. (1988)	3 with ID *Non-SGD*	5 peers[b] 1 student teacher	School/community *Conversation opportunities*	NR	NR
Hunt et al. (1991a)	3 with ID or MD *Non-SGD*	29 peers[b] 3 parents 1 respite worker	Home/school/community *Conversation opportunities*	Oral instruction, modeling, role play/rehearsal, authentic application (T + S)	NR
Aided AAC models as prompts					
Buzolich et al. (1991)	3 with OI or MD *SGD*	1 teacher 1 AAC specialist	School (N) *Small-group instruction*	NR	NR
Hamilton & Snell (1993)	1 with ASD *Non-SGD*	1 parent 1 teacher 2 paras	Home/school/community (N) *Natural activities*	NR	Checklist (B/I)
Rodi & Hughes (2000)	1 with MD *Non-SGD*	1 para 1 teacher	School/community (N) *Natural activities*	Oral instruction, modeling, role play/rehearsal, final assessment (T)	Criterion assessment Checklist (I)

(*table continues*)

Table 2. *(Continued).*

Study	Participants/*AAC*	Partners	Setting/*activity*	Partner instruction	Partner assessment
Aided AAC models within instructional demonstrations					
Hughes et al. (2000)	3 with ID or MD *Non-SGD*	13 peers	School *Instructional sessions*	Oral instruction, modeling, printed materials, discussion (T)	Checklist (I)
Combined forms of aided AAC modeling					
Heller et al. (1994)	3 with MD *Non-SGD*	1 teacher[b] 1 admin	School *Conversation opportunities*	NR	NR
Transition aged (18–21 years)					
Augmented input					
Hunt et al. (1990)	3 with ID *Non-SGD*	18 peers[b]	School/community *Conversation opportunities*	Oral instruction, modeling, role play/rehearsal, authentic application (T + C)	NR
Combined forms of aided AAC modeling					
Heller, Allgood, Ware, et al. (1996)	4 with MD *Non-SGD*	Special educator (#NR)	School *Instructional sessions*	NR	NR
Heller, Allgood, Davis, et al. (1996)	3 with MD *Non-SGD*	Vocational instructor (#NR)	School *Instructional sessions*	NR	NR

Note. All teachers were special education teachers. AAC = augmentative and alternative communication; Admin = administrator; ASD = autism spectrum disorder; B = baseline; CD = communication disorder (e.g., speech or language disorder not reported to result from another disability, includes childhood apraxia of speech); DD = developmental delay; I = intervention; ID = intellectual disability (i.e., including both children reported to have an intellectual disability not co-occurring with another primary disability and children reported to have specific genetic syndromes typically associated with an intellectual disability [e.g., Down syndrome]); MD = multiple disabilities; N = naturalistic setting (i.e., at least part of the intervention occurred within a child's regularly occurring activities and in regular settings); NR = not reported; OI = orthopedic impairment (e.g., cerebral palsy); para = paraprofessional; SGD = speech-generating device; T = preintervention training (i.e., partner instruction involved one or more training sessions occurring before the start of the intervention); S = concurrent support (i.e., partner instruction involved coaching, performance feedback, facilitation, or other support during part or all of the course of the intervention).

[a]Group design: reports the information relevant only for the intervention condition involving aided AAC modeling. [b]Researcher-interventionists implemented the interventions with the natural partners.

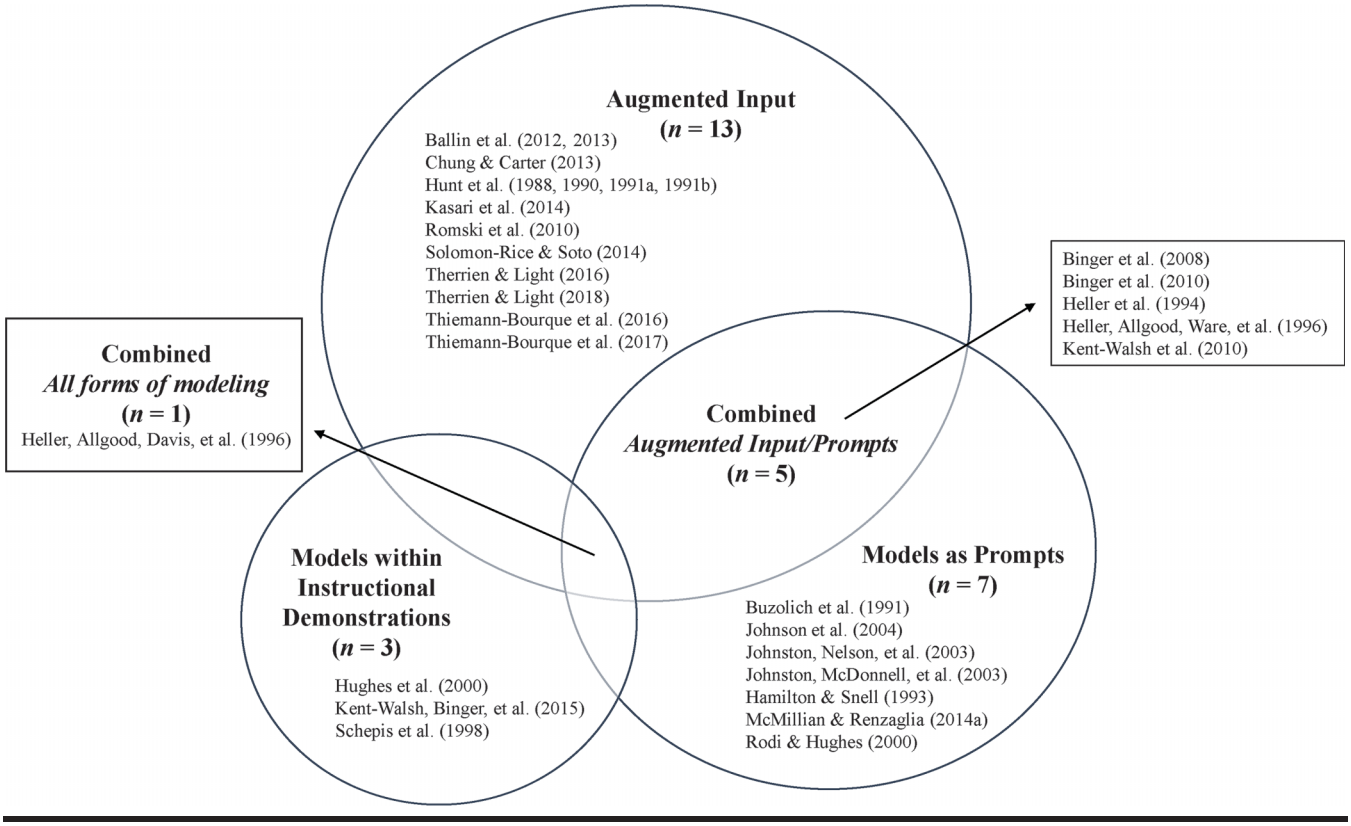
Table 3. Settings and interventionists in studies by age level of children with disabilities.

Characteristic	Early childhood (*n* = 13)	Elementary (*n* = 4)	Secondary (*n* = 9)	Transition (*n* = 3)	All (*n* = 29)
Intervention setting[a]					
School	9 (69.2%)	3 (75.0%)	8 (88.9%)	3 (100%)	24 (82.8%)
Community	0 (0.0%)	0 (0.0%)	5 (55.6%)	1 (33.3%)	6 (20.7%)
Home	3 (23.1%)	0 (0.0%)	2 (22.2%)	0 (0.0%)	5 (17.2%)
University or private clinic	2 (15.4%)	1 (25.0%)	0 (0.0%)	0 (0.0%)	3 (10.3%)
Intervention context[a]					
Naturalistic[b]	7 (53.8%)	2 (50.0%)	3 (33.3%)	0 (0.0%)	13 (44.8%)
Inclusive[c]	5 (38.5%)	2 (50.0%)	5 (55.6%)	1 (33.3%)	13 (44.8%)
Person(s) delivering intervention[a]					
Researcher	7 (53.8%)	2 (50.0%)	3 (33.3%)	1 (33.3%)	13 (44.8%)
Peer	6 (46.1%)	1 (25.0%)	4 (44.4%)	1 (33.3%)	12 (41.4%)
Special education teacher	2 (15.4%)	1 (25.0%)	4 (44.4%)	1 (33.3%)	8 (27.6%)
Paraprofessional	3 (23.1%)	1 (25.0%)	2 (22.2%)	0 (0.0%)	6 (20.7%)
Parent	4 (30.8%)	1 (25.0%)	2 (22.2%)	0 (0.0%)	7 (24.1%)
SLP or AAC specialist	1 (7.7%)	0 (0.0%)	1 (11.1%)	0 (0.0%)	2 (6.9%)
Other adult partner	0 (0.0%)	0 (0.0%)	4 (44.4%)	1 (33.3%)	5 (17.2%)

Note. SLP = speech-language pathologist; AAC = augmentative and alternative communication.

[a]More than one could be coded for a study. [b]The number and percentage of studies in which at least part of the intervention was delivered during a child's regularly occurring activities and settings. [c]The number and percentage of studies in which typically developing peers were present in the intervention setting, either engaged with the child or alongside the child in similar activities.

Figure 2. Graphic depiction of studies involving communication partners using three forms of aided augmentative and alternative communication modeling.



(10.3%; see Table 2). Partners implemented interventions in children's natural settings and activities in fewer than half of the studies (n = 13, 44.8%), and most naturalistic interventions focused on early childhood-aged participants (see Table 3). The activities comprising intervention contexts varied—such as shared reading and play for early childhood, instruction in general and special education classrooms for elementary, and one-to-one instruction or staged conversation opportunities for secondary and transition. Interventions often occurred in segregated rather than inclusive settings; 13 studies (44.8%) involved settings with peers, of which 11 were peer-mediated interventions.

What Procedures Have Been Used to Train and Support Partners?

Reporting of implementation procedures to instruct partners was limited; nine studies (31.0%) did not report information. Across studies, 12 different instructional strategies were identified comprising partner instruction (see Tables 1 and 2). The most frequently reported were (a) oral instruction (100.0% of studies reporting implementation procedures), (b) modeling of intervention strategies (95.0%), and (c) opportunities to receive support and/or performance feedback when practicing intervention strategies in a controlled situation (e.g., role play, verbal rehearsal, application to a case example; 65.0%) or applying intervention strategies directly with the child (80.0%). Of the 18 studies in which partners received feedback, 11 provided both types of opportunities (i.e., controlled and applied).

We analyzed the extent to which the delivery of partner instruction across studies was composed of preintervention training, concurrent support (e.g., coaching, consultation, facilitation), or both (see Table 2). Of the 20 studies reporting information, eight (40%) used only preintervention training, two (10.0%) used only concurrent support, and 10 (50.0%) combined preintervention training and concurrent support. Four studies involving only preintervention training provided partners' feedback when they applied intervention strategies with the child, but study authors framed this as a part of preintervention training (i.e., within a single-case design before the start of data collection for the intervention phase; Binger et al., 2008, 2010; Johnson, McDonnell, Holzwarth, & Hunter, 2004; Kent-Walsh et al., 2010). Within studies involving preintervention training, 12 (66.7%) reported the length, which ranged from 5 min to 2.5 hr for peer partners (M = 72.5 min) and 45 min to 3 hr for adult partners (M = 125 min). Both studies using only concurrent support focused on peers, and a researcher provided dyadic instruction to peers and the child with a disability simultaneously (i.e., Therrien & Light, 2016, 2018). Overall, studies were more likely to report providing concurrent support to peer partners (80% of studies reporting information) than to adult partners (41.7%). Partner instruction was more commonly delivered individually for adults and in pairs or small groups for peers.

An implementation science perspective underscores the importance of considering adherence not just to intervention practices (i.e., intervention fidelity) but also to implementation practices (i.e., implementation fidelity; Dunst et al., 2013; Fixsen et al., 2005)—in this case, the procedures associated with communication partner instruction. Measurement of implementation fidelity is important to ensure instructional procedures are conducted as planned and to inform the development of evidence-based implementation practices; however, less than a third of studies (31.0%) assessed and reported implementation fidelity (i.e., Ballin, Balandin, & Stancliffe, 2012; Binger et al., 2008, 2010; Chung & Carter, 2013; Kent-Walsh et al., 2010; Therrien & Light, 2016, 2018; Thiemann-Bourque et al., 2016, 2017).

How Have Partners' Behaviors Been Evaluated by Study Authors?

Researchers' assessment and reporting of intervention fidelity are also important (Dunst et al., 2013; Ledford & Wolery, 2013). Less than two thirds of studies (n = 18, 62.1%) reported intervention fidelity that addressed the behaviors of natural communication partners (see Table 2). Although some of these studies reported fidelity data of researcher-interventionist behaviors, they did not assess how well or often communication partners themselves used intervention strategies. Within single-case experiments, researchers have called attention to the importance of assessing fidelity across conditions (e.g., baseline and intervention; Ledford & Wolery, 2013). Eleven studies (37.9%) measured and reported data across baseline and intervention phases, seven of which provided graphed data (see Table 2).

What Are Partners' Perspectives of the Social Validity of Aided AAC Modeling Interventions and the Training and Support They Received?

About half of studies (n = 16, 55.2%) assessed any aspect of social validity of the aided AAC modeling interventions, which included partners' perspective on the intervention goals (n = 7 studies), procedures (n = 15), and/or outcomes (n = 16). Eleven used questionnaires, two used interviews, and three used both. In the subsample of studies addressing the social validity of goals (i.e., Chung & Carter, 2013; Heller, Allgood, Davis, et al., 1996; Hughes et al., 2000; McMillan & Renzaglia, 2014a; Solomon-Rice & Soto, 2014; Therrien & Light, 2016, 2018), researchers reported that stakeholders such as teachers, paraprofessionals, and SLPs indicated the goals were appropriate, aligned with needs, and important. Related to procedures, researchers generally reported that communication partners rated or described interventions as worth the time investment, relatively easy to understand, practical, and applicable for other children. Researchers also reported that partners indicated they would continue using the intervention strategies and/or recommend them to others and that educators viewed them as useful and not disruptive to other students in the class (e.g., Hamilton & Snell, 1993; Johnston, Nelson, Evans, & Palasolo, 2003; McMillan & Renzaglia, 2014a).

When researchers reported suggestions from partners to improve intervention procedures, these suggestions related to (a) wanting guidance about incorporating strategies into children's regularly occurring activities (e.g., Binger et al., 2010; Kent-Walsh et al., 2010), (b) addressing challenges related to vocabulary on the AAC devices (e.g., Chung & Carter, 2013; Heller, Allgood, Davis, et al., 1996), and (c) keeping students engaged and focused (e.g., Chung & Carter, 2013). Related to outcomes, researchers reported that partners rated interventions as effective and shared that children spontaneously communicated more often (e.g., Binger et al., 2008; Chung & Carter, 2013; Johnson et al., 2004), generalized communication skills to other settings (e.g., Binger et al., 2010), and participated more in instructional activities (e.g., Binger et al., 2008, Chung & Carter, 2013).

Consideration of the social validity of the implementation practices used to instruct partners was more limited; five studies addressed partners' perspectives on their experiences learning to use intervention strategies (i.e., Ballin et al., 2012; Binger et al., 2008, 2010; Kent-Walsh et al., 2010; McMillan & Renzaglia, 2014a). Researchers reported partners indicated they would recommend similar training programs and found the training beneficial. In Kent-Walsh et al. (2010), parents indicated they thought it was important to receive individualized instruction in their home. In McMillan and Renzaglia (2014a), teachers indicated the individualized training and support they received were more beneficial than large-group workshops.

Discussion

There is promising evidence regarding the effectiveness of aided AAC modeling interventions to help children with complex communication needs develop language skills and learn to use AAC (Allen et al., 2017; Biggs et al., 2018; Sennott et al., 2016). Although their involvement is critical, children's parents, teachers, paraprofessionals, and peers may not know how to use different forms of aided AAC modeling without training and support (Romski & Sevcik, 1996; Smith & Grove, 2003). The focus of this review was to map the ways children's communication partners participated in implementing aided AAC modeling interventions across 29 experimental studies. Our findings provide information about how researchers have involved natural partners and equipped them to support the communication of children with complex communication needs. Additionally, this scoping review identifies gaps and weaknesses in the existing literature and highlights important pathways for future research.

First, a substantial number of different communication partners implemented interventions involving aided AAC modeling within experimental studies. These communication partners comprised more than 250 peers, special educators, paraprofessionals, parents, and other adults with a wide array of characteristics (e.g., relationship with the child, age, educational background). Despite this diversity of communication partners, the authors of many studies gave limited attention to reporting how partners were selected or their specific characteristics. Detailed participant information is critical for future replication of studies and to afford the possibility of exploring whether specific partner characteristics are associated with stronger intervention fidelity and greater effectiveness.

We were interested in learning the extent to which children's communication partners used three different forms of aided AAC modeling—augmented input, models as prompts, and models within instructional demonstrations. In a previous review, interventions involving each of these distinct but related forms of modeling were found to improve expressive communication outcomes for children with complex communication needs (Biggs et al., 2018). Although a variety of communication partners used each form of modeling, peers and parents most often provided augmented input, whereas educators most often used models as prompts. Although not addressed directly by most study authors, we posit that peers might have been more likely to be taught augmented input because it allows for reciprocal interactions and opportunities for children to develop mutual relationships (Therrien & Light, 2018). Teaching peers to provide AAC models as prompts may encourage them to act more like a teacher than a friend. Educators and service providers interested in engaging peers in aided AAC modeling interventions should consider whether the roles they encourage peers to assume facilitate or hinder the development of reciprocal interactions and relationships (Biggs, Carter, & Gustafson, 2017). Conversely, school staff such as teachers and paraprofessionals already assume instructional roles in the lives of children and thus may be more appropriate communication partners to provide aided AAC models that function as prompts.

Second, children's communication partners implemented interventions across a range of settings—including in schools, homes, and the community. However, there is still much to learn about how to equip natural partners to model aided AAC within naturalistic settings, particularly for school-age children. Although a subset of interventions focused on aided AAC modeling within day-to-day routines and activities, most of these focused only on early childhood-aged participants. The large portion of early childhood studies taking place in naturalistic settings may not be surprising given (a) the empirical support for naturalistic and embedded instruction and (b) emphasis of early intervention and early childhood education on these approaches (Snyder et al., 2015). However, it is equally important to identify ways to support older, school-age children's communication in natural settings. This need is underscored by a legislative emphasis on supporting students within natural educational contexts that are their least restrictive environment (U.S. Department of Education, 2014). In our examination of social validity, we found that several adult partners requested more direction on how to use intervention strategies within a child's regularly occurring activities. Additional research is needed on implementing aided AAC modeling interventions within children's day-to-day contexts that also assess partners' perceptions of

the feasibility, acceptability, and sustainability of intervening in these settings. More information is also needed about using strategies within inclusive settings, as fewer than half of studies were implemented in settings involving peers without disabilities.

Third, descriptions of implementation practices highlight strategies that may be associated with improving partners' knowledge and skills. In more than half of the studies, partner instruction involved some form of concurrent support (e.g., coaching, consultation, facilitation) beyond preintervention training. Elsewhere in the literature, others have (a) raised concern that traditional trainings focused on disseminating information may not lead to behavior change of practitioners (e.g., Fixsen et al., 2005) and (b) addressed the importance of coaching and related follow-up support to behavior change (e.g., Brock et al., 2017; Kaminski et al., 2008; Kretlow & Bartholomew, 2010). Future research might directly investigate whether peer and adult communication partners more effectively learn to implement aided AAC modeling interventions when their instruction involves this type of concurrent support. Our findings also indicated that support during the intervention was reported more for peer than adult communication partners. This raises important questions about how much guidance and support partners need and whether peers and adults need different amounts and types of instruction and supports.

Across diverse implementation practices, the most frequent strategies to teach peer and adult partners were the same—orally sharing information, modeling intervention strategies, and providing practice opportunities with performance feedback (i.e., in controlled settings, applied settings, or both). Coupled with information from the broader literature about the importance of modeling and performance feedback (e.g., Brock & Carter, 2013; Kent-Walsh, Murza, et al., 2015), this may indicate that the combination of these strategies can be helpful for partners learning to use different forms of aided AAC modeling. Furthermore, many studies reported partners had opportunities to practice and receive feedback both in controlled situations and when using strategies directly with the child. Each type of practice opportunity may provide a different but important role in helping partners build confidence and competence.

Fourth, our review indicated patterns of limited or omitted reporting across a number of key aspects that are cause for concern—including intervention fidelity, implementation practices, and implementation fidelity. Rigorous assessment and reporting of intervention fidelity is important for many reasons, the principal of which is to increase internal validity by demonstrating that intervention practices were implemented fully and accurately (Dunst et al., 2013; Ledford & Wolery, 2013). Within communication partner interventions, intervention fidelity data are also critical to addressing questions of (a) whether these natural partners can implement aided AAC modeling interventions accurately, (b) what constitutes sufficient training and support for partners, and (c) why inconsistent child-level outcomes might exist (e.g., variations in fidelity might be related to outcome variability). Single-case design—which was used by most researchers represented in this review—allows an opportunity to begin to address these types of questions when procedural fidelity is collected across experimental conditions (Ledford & Wolery, 2013). Although most studies in this review reported some form of intervention fidelity, only a third reported data across baseline and intervention conditions. Furthermore, only two thirds of studies reported the implementation practices comprising partner instruction, and among studies containing this information, many did not describe procedures with the detail required for replication. Even fewer studies assessed implementation fidelity related to partner instruction (i.e., Ballin et al., 2012; Binger et al., 2008, 2010; Chung & Carter, 2013; Kent-Walsh et al., 2010; Therrien & Light, 2016, 2018; Thiemann-Bourque et al., 2016, 2017).

Implementation features are as critical to the effectiveness of these interventions in practice as the intervention practices themselves (Dunst et al., 2013). Answering questions about the effectiveness of communication partner instruction on child communication outcomes requires experimental analysis not only of child-focused communicative behaviors but also of partner-focused behaviors. In other words, empirical links must be identified (a) between specific implementation practices and a change in partner behaviors and (b) between the change in partner behaviors and a change in child outcomes. Because few studies involved such a rigorous approach, we are unable to provide conclusions about the effectiveness of different approaches to partner instruction. To address this concern, future researchers might adopt a layered or cascading design used in a few studies in this review (e.g., Binger et al., 2008; Kent-Walsh et al., 2010; McMillan & Renzaglia, 2014a, 2014b), which experimentally controls the introduction of partner instruction within a single-case design and assesses both partner- and child-focused dependent variables for demonstrations of change. Furthermore, using comparative designs would provide insight into which strategies or combinations of partner instructional strategies are more effective. Future research should also address questions related to partners' long-term maintenance of strategies, whether they generalize their use (e.g., to new vocabulary, AAC devices, students, or activities), and how perspectives of social validity relate to the fidelity with which partners use intervention strategies.

Limitations

Limitations should be considered related to this review. First, the interventions often involved a number of different strategies that varied across included studies. Although all studies involved aided AAC modeling as a salient intervention component, we did not examine whether partner instruction differed related to the number or types of other strategies partners learned to use. Second, our ability to describe the involvement and instruction of partners was limited by the details provided by individual study authors. Some authors did not provide thorough details and may have omitted any information they did not consider important.

Conclusions should be made with caution whenever information was not reported.

Implications for Practice

Aided AAC modeling interventions hold promise to help many children build communication skills to connect with others, gain and share information, and influence their environments (Allen et al., 2017; Biggs et al., 2018). Understanding how peer and adult partners learn to implement aided AAC modeling interventions is a critical step to moving these interventions into practice. Through this review of existing research, we found a variety of natural partners—including peers, parents, teachers, and paraprofessionals—have implemented a breadth of different but related aided AAC modeling interventions within empirical studies. Teaching natural partners to use simple, effective interaction techniques such as modeling AAC can improve the reach of communication intervention for children with complex communication needs. These natural partners typically have numerous opportunities to interact with a child throughout the day. When parents, teachers, paraprofessionals, or peers model AAC during meaningful, motivating activities and interactions, children can acquire the meaning of new vocabulary words, learn to use more complex grammatical structures, have opportunities to imitate target communicative behaviors, and see aided AAC as a valid and encouraged means of communication (Biggs et al., 2018; Drager, 2009; Romski & Sevcik, 1996). Children learning to use aided AAC should be given frequent opportunities at school, at home, and in community settings to see others communicate with AAC systems and map graphic symbols to events, actions, and objects in their environments.

Unfortunately, parents, peers, and educators often have minimal knowledge or skills related to supporting communication for children who use aided AAC. For example, special educators often receive limited or no preservice training related to AAC interventions (Costigan & Light, 2010). Peers may not know how to have a successful interaction with a classmate who is learning to use aided AAC (Carter, Huber, & Biggs, 2015). Baseline data patterns from studies in this review suggest children's peer and adult communication partners did not model the use of aided AAC prior to receiving targeted instruction (e.g., Binger et al., 2008, 2010; Chung & Carter, 2013; Hamilton & Snell, 1993; Kent-Walsh et al., 2010; McMillan & Renzaglia, 2014a). Without training and support, communication partners may not know how or why to use different forms of aided AAC modeling. Although peers, parents, and educators can implement aided AAC modeling interventions, they likely need direction, planning, and instruction to do so. SLPs and AAC specialists should consider approaches to service delivery that emphasize providing instruction for a full range of natural communication partners to learn to use different forms of aided AAC modeling. An important implication from this review, underscored by implementation science research (e.g., Brock et al., 2017; Dunst et al., 2013; Fixsen et al., 2005; Trivette, Dunst, Hamby, & O'Herin, 2009), is that communication partners benefit from receiving concurrent support while learning to implement different forms of aided AAC modeling—such as coaching, consultation, and facilitation—in addition to preintervention training. SLPs serving children with complex communication needs who seek to incorporate partner instruction should leverage high-impact implementation practices (e.g., modeling, performance feedback; Brock et al., 2017; Trivette et al., 2009) to train and support a range of different partners. Ensuring these partners gain skills and knowledge to interact with and promote the communication of children with complex communication needs may have a critical impact on children's success in learning to use aided AAC.

Acknowledgments

Partial support for this research was provided by a grant from the Tennessee Department of Education to Vanderbilt University (CFDA No. 84.027A) and from the Office of Special Education Programs, U.S. Department of Education, through Grant H325D100010 to Vanderbilt University.

References

References marked with an asterisk (*) indicate studies included in the review.

Allen, A. A., Schlosser, R. W., Brock, K. L., & Shane, H. C. (2017). The effectiveness of aided augmented input techniques for persons with developmental disabilities: A systematic review. *Augmentative and Alternative Communication, 33,* 149–159. https://doi.org/10.1080/07434618.2017.1338752

Arksey, H., & O'Malley, L. (2005). Scoping studies: Toward a methodological framework. *International Journal of Social Research Methodology, 8*(1), 19–32. https://doi.org/10.1080/1364557032000119616

Armstrong, R., Hall, B. J., Doyle, J., & Waters, E. (2011). Cochrane update. 'Scoping the scope' of a Cochrane review. *Journal of Public Health, 33,* 147–150. https://doi.org/10.1093/pubmed/fdr015

***Ballin, L., Balandin, S., & Stancliffe, R. J.** (2012). The speech generating device (SGD) mentoring program: Training adults who use an SGD to mentor. *Augmentative and Alternative Communication, 28,* 254–265. https://doi.org/10.3109/07434618.2012.708880

***Ballin, L., Balandin, S., & Stancliffe, R. J.** (2013). The speech generating device (SGD) mentoring program: Supporting the development of people learning to use an SGD. *Journal of Developmental and Physical Disabilities, 25,* 437–459. https://doi.org/10.1007/s10882-012-9322-0

Biggs, E. E., Carter, E. W., & Gilson, C. B. (2018). Systematic review of interventions involving aided AAC modeling for children with complex communication needs. *American Journal on Intellectual and Developmental Disabilities, 123*(5), 443–473. https://doi.org/10.1352/1944-7558-123.5.443

Biggs, E. E., Carter, E. W., & Gustafson, J. (2017). Efficacy of peer support arrangements to increase peer interaction and AAC use. *American Journal on Intellectual and Developmental Disabilities, 122,* 25–48. https://doi.org/10.1352/1944-7558-122.1.25

***Binger, C., Kent-Walsh, J., Berens, J., Del Campo, S., & Rivera, D.** (2008). Teaching Latino parents to support the multi-symbol message productions of their children who require AAC.

Augmentative and Alternative Communication, 24, 323–338. https://doi.org/10.1080/07434610802130978

***Binger, C., Kent-Walsh, J., Ewing, J., & Taylor, S.** (2010). Teaching educational assistants to facilitate the multisymbol message productions of young children who require augmentative and alternative communication. *American Journal of Speech-Language Pathology, 19,* 108–120. https://doi.org/10.1044/1058-0360(2009/09-0015)

Binger, C., & Light, J. (2007). The effect of aided AAC modeling on the expression of multi-symbol messages by preschoolers who use AAC. *Augmentative and Alternative Communication, 23,* 30–43. https://doi.org/10.1080/07434610600807470

Brock, M. E., Cannella-Malone, H. I., Seaman, R. L., Andzik, N. R., Schaefer, J. M., Page, E. J., . . . Dueker, S. A. (2017). Findings across practitioner training studies in special education: A comprehensive review and meta-analysis. *Exceptional Children, 84,* 7–26. https://doi.org/10.1177/0014402917698008

Brock, M. E., & Carter, E. W. (2013). A systematic review of paraprofessional-delivered educational practices to improve outcomes for students with intellectual and developmental disabilities. *Research and Practice for Persons with Severe Disabilities, 38*(4), 211–221. https://doi.org/10.1177/154079691303800401

***Buzolich, M. J., King, J. S., & Baroody, S. M.** (1991). Acquisition of the commenting function among system users. *Augmentative and Alternative Communication, 7,* 88–99. https://doi.org/10.1080/07434619112331275753

Carter, E. W., Huber, H. B., & Biggs, E. E. (2015). The importance of peers as communication partners. In J. E. Downing, A. Hanreddy, & K. D. Peckham-Hardin (Eds.), *Teaching communication skills to students with severe disabilities* (3rd ed., pp. 233–258). Baltimore, MD: Brookes.

***Chung, Y.-C., & Carter, E. W.** (2013). Promoting peer interactions in inclusive classrooms for students who use speech-generating devices. *Research and Practice for Persons with Severe Disabilities, 38,* 94–109. https://doi.org/10.2511/027494813807714492

Colquhoun, H. L., Levac, D., O'Brien, K. K., Straus, S., Tricco, A. C., Perrier, L., . . . Moher, D. (2014). Scoping reviews: Time for clarity in definitions, methods, and reporting. *Journal of clinical epidemiology, 67*(12), 1291–1294. https://doi.org/10.1016/j.jclinepi.2014.03.013

Costigan, F. A., & Light, J. (2010). A review of preservice training in augmentative and alternative communication for speech-language pathologists, special education teachers, and occupational therapists. *Assistive Technology, 22,* 200–212. https://doi.org/10.1080/10400435.2010.492774

Drager, K. D. R. (2009). Aided modeling interventions for children with autism spectrum disorders who require AAC. *Perspectives on Augmentative and Alternative Communication, 18,* 114–120. https://doi.org/10.1044/aac18.4.114

Dunst, C. J., Trivette, C. M., & Raab, M. (2013). An implementation science framework for conceptualizing and operatio nalizing fidelity in early childhood intervention studies. *Journal of Early Intervention, 35,* 85–101. https://doi.org/10.1177/1053815113502235

Fixsen, D. L., Naoom, S. F., Blasé, K. A., Friedman, R. M., & Wallace, F. (2005). *Implementation research: A synthesis of the literature (FMHI Publication #231)*. Tampa, FL: University of South Florida, Louis de la Parte Florida Mental Health Institute, The National Implementation Research Network.

***Hamilton, B. L., & Snell, M. E.** (1993). Using the milieu approach to increase spontaneous communication book use across environments by an adolescent with autism. *Augmentative and Alternative Communication, 9,* 259–272. https://doi.org/10.1080/07434619312331276681

***Heller, K. W., Allgood, M. H., Davis, B., Arnold, S. E., Castelle, M. D., & Taber, T. A.** (1996). Promoting nontask-related communication at vocational sites. *Augmentative and Alternative Communication, 12,* 169–180. https://doi.org/10.1080/07434619612331277618

***Heller, K. W., Allgood, M. H., Ware, S., Arnold, S. E., & Castelle, M. D.** (1996). Initiating requests during community-based vocational training by students with mental retardation and sensory impairments. *Research in Developmental Disabilities, 17,* 173–184. https://doi.org/10.1016/0891-4222(95)00040-2

***Heller, K. W., Ware, S., Allgood, M. H., & Castelle, M.** (1994). Use of dual communication boards with students who are deafblind. *Journal of Visual Impairment & Blindness, 88,* 368–376.

***Hughes, C., Rung, L. L., Wehmeyer, M. L., Agran, M., Copeland, S. R., & Hwang, B.** (2000). Self-prompted communication book use to increase social interaction among high school students. *Research and Practice for Persons with Severe Disabilities, 25,* 153–166. https://doi.org/10.2511/rpsd.25.3.153

***Hunt, P., Alwell, M., & Goetz, L.** (1988). Acquisition of conversation skills and the reduction of inappropriate social interaction behaviors. *Research and Practice for Persons with Severe Disabilities, 13,* 20–27. https://doi.org/10.1177/154079698801300103

***Hunt, P., Alwell, M., & Goetz, L.** (1991a). Establishing conversational exchanges with family and friends: Moving from training to meaningful communication. *The Journal of Special Education, 25,* 305–319. https://doi.org/10.1177/002246699102500304

***Hunt, P., Alwell, M., & Goetz, L.** (1991b). Interacting with peers through conversation turntaking with a communication book adaptation. *Augmentative and Alternative Communication, 7,* 117–126. https://doi.org/10.1080/07434619112331275783

***Hunt, P., Alwell, M., Goetz, L., & Sailor, W.** (1990). Generalized effects of conversation skill training. *Research and Practice for Persons with Severe Disabilities, 15,* 250–260. https://doi.org/10.1177/154079699001500404

Individuals with Disabilities Education Improvement Act, 20 U.S. C. § 1400 (2004).

***Johnson, J. W., McDonnell, J., Holzwarth, V. N., & Hunter, K.** (2004). The efficacy of embedded instruction for students with developmental disabilities enrolled in general education classes. *Journal of Positive Behavior Interventions, 6,* 214–227. https://doi.org/10.1177/10983007040060040301

***Johnston, S. S., McDonnell, A. P., Nelson, C., & Magnavito, A.** (2003). Teaching functional communication skills using augmentative and alternative communication in inclusive settings. *Journal of Early Intervention, 25,* 263–280. https://doi.org/10.1177/105381510302500403

***Johnston, S. S., Nelson, C., Evans, J., & Palasolo, K.** (2003). The use of visual supports in teaching young children with autism spectrum disorder to initiate interactions. *Augmentative and Alternative Communication, 19,* 86–103. https://doi.org/10.1080/0743461031000112016

Kaminski, J. W., Valle, L. A., Filene, J. H., & Boyle, C. L. (2008). A meta-analytic review of components associated with parent training program effectiveness. *Journal of Abnormal Child Psychology, 36,* 567–589. https://doi.org/10.1007/s10802-007-9201-9

***Kasari, C., Kaiser, A., Goods, K., Nietfeld, J., Mathy, P., Landa, R., . . . Almirall, D.** (2014). Communication interventions for minimally verbal children with autism: A sequential multiple assignment randomized trial. *Journal of the American Academy of Child & Adolescent Psychiatry, 53,* 635–646. https://doi.org/10.1016/j.jaac.2014.01.019

*Kent-Walsh, J., Binger, C., & Buchanan, C. (2015). Teaching children who use augmentative and alternative communication to ask inverted yes/no questions using aided modeling. *American Journal of Speech-Language Pathology, 24,* 222–236. https://doi.org/10.1044/2015_AJSLP-14-0066

*Kent-Walsh, J., Binger, C., & Hasham, Z. (2010). Effects of parent instruction on the symbolic communication of children using augmentative and alternative communication during storybook reading. *American Journal of Speech-Language Pathology, 19,* 97–107. https://doi.org/10.1044/1058-0360(2010/09-0014)

Kent-Walsh, J., & McNaughton, D. (2005). Communication partner instruction in AAC: Present practices and future directions. *Augmentative and Alternative Communication, 21,* 195–204. https://doi.org/10.1080/07434610400006646

Kent-Walsh, J., Murza, K. A., Malani, M. D., & Binger, C. (2015). Effects of communication partner instruction on the communication of individuals using AAC: A meta-analysis. *Augmentative and Alternative Communication, 31,* 271–284. https://doi.org/10.3109/07434618.2015.1052153

Kretlow, A. G., & Bartholomew, C. C. (2010). Using coaching to improve the fidelity of evidence-based practices: A review of studies. *Teacher Education and Special Education, 33,* 279–299. https://doi.org/10.1177/0888406410371643

Lang, R., Machalicek, W., Rispoli, M., & Regester, A. (2009). Training parents to implement communication interventions for children with autism spectrum disorders (ASD): A systematic review. *Evidence-Based Communication Assessment and Intervention, 3,* 174–190. https://doi.org/10.1080/17489530903338861

Ledford, J. R., & Wolery, M. (2013). Procedural fidelity: An analysis of measurement and reporting practices. *Journal of Early Intervention, 35,* 173–193. https://doi.org/10.1177/1053815113515908

*McMillan, J. M., & Renzaglia, A. (2014a). Supporting speech generating device use in the classroom. Part 1: Teacher professional development. *Journal of Special Education Technology, 29,* 31–47.

*McMillan, J. M., & Renzaglia, A. (2014b). Supporting speech generating device use in the classroom. Part 2: Student communication outcomes. *Journal of Special Education Technology, 29,* 49–61.

Roberts, M. Y., & Kaiser, A. P. (2011). The effectiveness of parent-implemented language interventions: A meta-analysis. *American Journal of Speech-Language Pathology, 20,* 180–199. https://doi.org/10.1044/1058-0360(2011/10-0055)

*Rodi, M. S., & Hughes, C. (2000). Teaching communication book use to a high school student using a milieu approach. *Research and Practice for Persons with Severe Disabilities, 25,* 175–179. https://doi.org/10.2511/rpsd.25.3.175

Romski, M. A., & Sevcik, R. (1996). *Breaking the speech barrier: Language development through augmented means*. Baltimore, MD: Brookes.

*Romski, M. A., Sevcik, R. A., Adamson, L. B., Cheslock, M., Smith, A., & Bakeman, R. (2010). Randomized comparison of augmented and nonaugmented language interventions for toddlers with developmental delays and their parents. *Journal of Speech, Language, and Hearing Research, 53,* 350–364. https://doi.org/10.1044/1092-4388(2009/08-0156)

*Schepis, M. M., Reid, D. H., Behrmann, M. M., & Sutton, K. A. (1998). Increasing communicative interactions of young children with autism using a voice output communication aid and naturalistic teaching. *Journal of Applied Behavior Analysis, 31,* 561–578. https://doi.org/10.1901/jaba.1998.31-561

Sennott, S. C., Light, J. C., & McNaughton, D. (2016). AAC modeling intervention research review. *Research and Practice for Persons with Severe Disabilities, 41,* 101–115. https://doi.org/10.1177/1540796916638822

Smith, M., & Grove, N. (2003). Asymmetry in input and output for individuals who use augmentative and alternative communication. In J. Light, D. Beukelman, & J. Reichle (Eds.), *Communicative competence of individuals who use augmentative and alternative communication* (pp. 163–195). Baltimore, MD: Brookes.

Snell, M. E., Brady, N., McLean, L., Ogletree, B. T., Siegel, E., Sylvester, L., . . . Sevcik, R. (2010). Twenty years of communication intervention research with individuals who have severe intellectual and developmental disabilities. *American Journal of Intellectual and Developmental Disabilities, 5,* 364–380. https://doi.org/10.1352/1944-7558-115-5.364

Snyder, P. A., Rakap, S., Hemmeter, M. L., McLaughlin, T. W., Sandall, S., & McLean, M. (2015). Naturalistic instructional approaches in early learning: A systematic review. *Journal of Early Intervention, 37,* 69–97. https://doi.org/10.1177/1053815115595461

*Solomon-Rice, P. L., & Soto, G. (2014). Facilitating vocabulary in toddlers using AAC: A preliminary study comparing focused stimulation and augmented input. *Communication Disorders Quarterly, 35,* 204–215. https://doi.org/10.1177/1525740114522856

*Therrien, M. C. S., & Light, J. (2016). Using the iPad to facilitate interaction between preschool children who use AAC and their peers. *Augmentative and Alternative Communication, 32*(3), 163–174. https://doi.org/10.1080/07434618.2016.1205133

*Therrien, M. C. S., & Light, J. (2018). Promoting peer interaction for preschool children with complex communication needs and autism spectrum disorder. *American Journal of Speech-Language Pathology, 27*(1), 207–221. https://doi.org/10.1044/2017_ajslp-17-0104

Thiemann-Bourque, K., Brady, N., McGuff, S., Stump, K., & Naylor, A. (2016). Picture exchange communication system and pals: A peer-mediated augmentative and alternative communication intervention for minimally verbal preschoolers with autism. *Journal of Speech, Language, and Hearing Research, 59*(5), 1133–1145. https://doi.org/10.1044/2016_jslhr-l-15-0313

Thiemann-Bourque, K., McGuff, S., & Goldstein, H. (2017). Training peer partners to use a speech-generating device with classmates with autism spectrum disorder: Exploring communication outcomes across preschool contexts. *Journal of Speech, Language, and Hearing Research, 60*(9), 2648–2662. https://doi.org/10.1044/2017_jslhr-l-17-0049

Trivette, C. M., Dunst, C. J., Hamby, D. W., & O'Herin, C. E. (2009). Characteristics and consequences of adult learning methods and strategies (*Winterberry Research Synthesis*, Vol. 2, No. 2). Asheville, NC: Winterberry Press.

U.S. Department of Education. (2014). *2012 IDEA part B child count educational environments*. Washington, DC: Author.