Review

Parent-implemented naturalistic language interventions for young children with disabilities: A systematic review of single-subject experimental research studies

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\textbf{ABSTRACT}

The purpose of this article was to critically review and examine the empirical literature focused on parent-implemented naturalistic intervention approaches designed to support language development of young children with disabilities who were 60 months or younger. A systematic review of the literature yielded 15 parent-implemented naturalistic language intervention studies that employed a single-subject experimental research design to evaluate functional relationships between (a) parent training and parents’ implementation of the naturalistic intervention approaches, and (b) parents’ implementation of naturalistic interventions and child language learning outcomes. The studies were examined using an investigator-developed coding protocol. The results indicated that parents could learn naturalistic language interventions and were able to implement them with their young children. The review showed that when parents’ implemented these interventions positive changes were identified in the children’s language skills. Critical features of parent-implemented language interventions are discussed. Limitations of the present review as well as the current literature are identified. Future directions to advance research focusing on parent-implemented naturalistic language intervention approaches are highlighted.

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1. Introduction

The acquisition of language skills is very critical for young children as language development is one of the foundations upon which other developmental skills are built. Children with typical development acquire language skills naturally by interacting with their social environment (Hart & Risley, 1968). Children with disabilities, however, may not acquire these skills at the same rate as children without disabilities during the early years of their lives (Harlaar et al., 2008; Snowling, Bishop, & Stothard, 2000).

According to the report of the United States Preventive Services Task Force (2006), delays and deficits in language acquisition are the most prevalent early childhood disabilities that affect about 1 in 12 children (i.e., approximately 5% to 8% of all preschool children and 70% of preschool children with disabilities). Delays and deficits in the acquisition of language skills can cause serious problems in young children’s social, emotional, and educational development (Warren & Rogers-Warren, 1983). To prevent negative influences of language deficits on their development, it is important to provide young children with disabilities with language-focused interventions as early as possible (Moeller, 2000; Warren, 1991; Yoshinaga-Itano, Sedey, Coulter, & Mehl, 1998).

Several intervention approaches have been developed to support the language development of young children with disabilities. Early language interventions were developed based on the behavioral model. Behavioral approaches are developed based on the theory of Skinner (1957) who believed all behaviors are learned and language needs to be directly shaped and reinforced. Early applications of behavioral interventions were highly structured and adult-directed. In early behavioral programs educating young children with disabilities, instruction was often delivered in contrived environments using a discrete trial training method. In this model, each trial begins with an instruction or question from the adult (antecedent), followed by a response from the child, and a consequence (reinforcer) delivered by the adult (Lovaas, Koegel, Simmons, & Long, 1973). In a teaching session, the child and adult sit at a table with environmental distractions minimized and the adult presents consecutive trials until the child performs the behavior to a pre-determined mastery level. In this model, the adult initiates and determines the content of the language teaching regardless of the child’s interests (Delprado, 2001). The consequence provided after the child’s correct response is usually unrelated to the target language response. Abundant empirical evidence exists in the literature supporting the effectiveness of discrete trial training in helping individuals with disabilities develop language skills (e.g., Charlop-Christy & Carpenter, 2000; Lovaas & Taubman, 1981; Lovaas et al., 1973).

Although discrete trial training is effective in terms of rapid language response acquisition, several limitations of this method are noted in the literature. Due to its highly-structured nature, children who acquire the language skills during the intervention context fail to generalize these skills to new contexts and maintain them over time (Hart & Risley, 1968). In addition, because language teaching sessions are conducted outside of natural, everyday communication situations, children often fail to use the language skills they learned during intervention sessions when communicating with others during naturally occurring activities and routines, outside of the intervention contexts (Hart & Risley, 1968). In the late 1960s, after observing the lack of generalization of language skills taught through highly-structured training sessions, using the same behavioral principles, Hart and Risley (1968, 1974, 1975) developed a naturalistic teaching procedure called incidental teaching and demonstrated its effectiveness with children from socio-economically disadvantaged families.

Following the studies by Hart and Risley, researchers continued to investigate the effectiveness of incidental teaching. Incidental teaching requires children to initiate communication and therefore, several modifications were made to use this
In parent-implemented naturalistic language intervention programs, parents become the primary intervention agents. They receive training as to how to implement a naturalistic intervention approach in order to facilitate their children's language development through implementing the strategies they learn. When parents are the primary intervention agents, they work directly with a professional as opposed to their children receiving direct intervention from the professional. Parents and professionals collaboratively develop an intervention plan and select target skills for the intervention. Professionals monitor parents' implementation of the naturalistic intervention and may provide parents with feedback and coaching to improve implementation fidelity. Parents and professionals together evaluate the effectiveness of the intervention in terms of the child outcomes (Kaiser, Hancock, & Hester, 1998).

In parent-implemented naturalistic language intervention programs, parent-implemented language interventions have a significant, positive impact on language skills of young children with language impairments, indicated by effect sizes ranged from 0.15 to .82 for child measures. This meta-analysis only included studies employing a group experimental research design and excluded studies using single-subject experimental research (SSER) designs. However, authors acknowledged the contribution of SSER studies to research on parent-implemented language interventions and briefly described four studies employing SSER (Delaney & Kaiser, 2001; Gillett & LeBlanc, 2007; Hemmeter & Kaiser, 1994; Kashinath, Woods, & Goldstein, 2006). Three of these studies, excluding the Kashinath et al. (2006) met the inclusion criteria and were included in the present review. Moreover, Roberts and Kaiser (2011) noted the need for a comprehensive review of SSER studies across populations and intervention approaches to determine additional evidence for parent-implemented language interventions.

In another review, Meadan, Ostrosky, Zaghlawan, and Yu (2009) reviewed 12 studies of parent-implemented language interventions for children with autism. The review included both group experimental and SSER design studies. The 12 studies investigated 10 different intervention approaches or teaching strategies. These included joint attention and joint engagement intervention (n = 2), in-home training program for fathers (n = 2), modified incidental teaching (n = 1), reciprocal imitation training (n = 1), enhanced milieu teaching (n = 1), functional communication training (n = 1), Denver model (n = 1), language teaching strategies (n = 1), relationship-focused intervention (n = 1), and pivotal response training (n = 1). The authors found all 12 studies reported positive outcomes for parents and children. Three of the 12 studies reviewed by Meadan et al. (2009) met the inclusion criteria and, therefore, were included in the present review (i.e., Kaiser, Hancock, & Nietfeld, 2000 [enhanced milieu teaching]; Moes & Frea, 2002 [functional communication training; Symon, 2005 [pivotal response training]].

In general, all naturalistic language intervention approaches share several common principles. These include (1) the adult follows the child’s lead; (2) the activities that provide the context for the intervention are child led; (3) the targets chosen address skills needed by the child to participate in ongoing classroom activities; (4) the adult is highly responsive to the child’s communicative attempts; and (5) instruction is provided by those adults who regularly interact with the child (Horn & Banerjee, 2009; Rule, Losardo, Dinnebeil, Kaiser, & Rowland, 1998).

Parents play a central role in their children’s language development (Hart & Risley, 1995; Roberts & Kaiser, 2011; Smith, Landry, & Swank, 2000; Tamis-LeMonda, Bornstein, & Baumwell, 2001). Parents are usually acknowledged as the first teachers of their children and they are intrinsically motivated to promote their children’s well-being and support their development (Bornstein, 2002; Britto, Brooks-Gunn, & Griffin, 2006; Reese, Sparks, & Leyva, 2010; Roberts & Kaiser, 2011). Therefore, teaching parents to use language interventions at home is considered an effective way of helping children to develop language skills (Kaiser, Hester, Alpert, & Whiteman, 1995). Kaiser (1993) highlighted three important reasons for parent involvement in language interventions. Firstly, parents are usually consistent in the child’s every day environment. Secondly, parent-implemented naturalistic interventions are believed to promote the generalization of newly learned language skills. Thirdly, everyday interaction with a dedicated caregiver is considered critical for facilitating the child’s language development.

The purpose of the present literature review was to examine the empirical literature focused on parent–implemented naturalistic intervention approaches designed to support language development in young children with disabilities. Such a review may help practitioners working with young children with disabilities and their parents to identify characteristics of effective naturalistic language interventions and to determine attributes of successful training programs for parents.
SSER is widely used in the field of special education and plays a critical role in identifying evidence-based practices. This research method, like group experimental research method, allows researchers to draw causal or functional relationships between independent and dependent variables (Tankersley, Harjusola-Webb, & Landrum, 2008). SSER employs within- and between-subject comparison to control for threats to interval validity and requires systematic replication of the treatment effect to enhance interval validity (Horner et al., 2005). Moreover, rigorous single-subject methodology meets the principles of scientific research established by the National Academy of Science (Shavelson & Towne, 2002). Information obtained from SSER studies can provide additional evidence about the effects on an intervention on child learning outcomes. Therefore, this review focused on examining studies employing SSER design to investigate the impact of parent-implemented naturalistic language interventions on the language skills of young children with a range of disabilities.

The following research questions guided the present review:

1. What parent-implemented naturalistic language intervention approaches were studied?
2. What were the attributes of study participants?
3. What were the characteristics of parent training programs?
4. What was the methodological quality of the studies reviewed?
5. What outcomes were observed for parent and child participants with respect to skill acquisition, generalization, and maintenance?

2. Method

2.1. Inclusion/exclusion criteria

For a study to be included in this review, it had to meet five criteria. First, the study had to be published in English. Second, the study had to be empirically-based research focused on training parents to implement a naturalistic language intervention approach. As the focus of this review was the naturalistic language approaches, studies that investigated parents’ use of specific instructional strategies (e.g., mand-model or time delay) were not included in this review. Dialogic reading studies were also excluded. Third, the study had to use a SSER design. Fourth, the study had to provide parent implementation and child outcome data. Fifth, the study had to include at least one child participant with identified disabilities who was 60 months old or younger at the beginning of the study. Age range was determined based on the previous reviews of the literature focused on parent-implemented language and communication interventions (e.g., Meadan et al., 2009; Roberts & Kaiser, 2011).

Studies implemented in clinical settings were included in this review if parents implemented interventions within the context of an activity that was appropriate for their children’s development (e.g., play) rather than in a contrived setting. Although some researchers might not consider studies implemented within play activities in clinics as naturalistic, in the past, parent-implemented interventions typically occurred during highly structured environments in clinics or home settings (Kashinath et al., 2006). Thus, the studies included in this review in which the interventions were implemented during play activities in clinics are more naturalistic than previous studies that were implemented in artificial settings.

2.2. Article search

A literature search was conducted to identify research published in peer-reviewed journals that focused on parent-implemented naturalistic approaches to language instruction for young children with disabilities. The search process to identify potential studies for the review involved three stages.

An electronic database search was conducted in the first stage using PsycInfo, Education full-text, Academic Search Premier, Cumulative Index to Nursing and Allied Health (CINAHL), Linguistics and Language Behavior Abstract, Education Resource Information Center (ERIC), Psychology and Behavioral Sciences, and Web of Science. Following terms were used in multiple combinations: parent, mother, father, implement*, intervention, child*, disabil*, impairment, retardation, delay, communication, language, social, and naturalistic. In the second stage, an ancestral hand search of the reference lists of all articles that met the inclusion criteria from the initial screening was conducted. In the third stage, names of researchers whose studies focused on parent-implemented naturalistic language interventions were searched using the search engines previously described. No time limit was set during any stage of the search.

2.3. Screening and coding

The three-stage process resulted in 519 unique articles. The abstract of each article was screened based on the inclusion/exclusion criteria previously described. When an abstract did not contain sufficient information to make an inclusion/exclusion decision, the full article was briefly reviewed. After the initial screening phase, the number of studies was reduced from 519 to 21. In this phase articles were excluded for four main reasons: (a) the studies did not report an empirically-based research, (b) they did not employ a SSER design, (c) participating children did not have an identified disability or were older than 60 months of age at the onset of the study, and (d) the intervention was implemented in a segregated area in the clinic (not during play activities). The remaining 21 studies were read in their entirety to determine whether each study met the
inclusion criteria. Once each article was examined in detail, six additional studies were excluded. These studies were excluded because they either investigated dialogic reading interventions/specific instructional procedures (not named approaches), or they did not provide both parent and child outcome data. Therefore, the screening process resulted in 15 articles. A systematic coding process was used to extract data from the 15 studies. Two coders read each study in its entirety and recorded information about the study using an investigator-developed coding protocol.

2.4. Coding protocol

Coding protocol used to record information about each study included four major sections: (a) attributes of participants, (b) methodological characteristics, (c) parent training program, and (d) child and family outcomes. The first section was used to record information about the attributes of children, parents, and parent trainers (e.g., gender, age, and race/ethnicity). The second section was used to record information about the methodological characteristics of the studies. These included the name of the naturalistic language approach studied, the country in which the study was implemented, research design used, and activities and settings in which the study was implemented. The third section focused on parent training program and was used to extract information with respect to parent training strategies, dosage of the training program, and implementation fidelity of the parent-training program. Finally, the last section was used to record information related to child and parent outcomes as well as the reliability of the measurement of child and parent behaviors. Coders read each article and recorded information into each section of the protocol as reported by the author(s). When an article did not provide information related to a category (e.g., race/ethnicity), coders recorded N/A (not available) into the space for that category. The coding protocol was adapted from McLaughlin, Denney, Snyder, and Welsh (2011).

2.5. Methodological quality

In addition to assessing various characteristics of the studies using the coding protocol described above, the methodological quality of each study was evaluated using the Single-Case Experimental Design (SCED) Scale (Tate et al., 2008). The scale includes 11 quality indicators: (a) clinical history, (b) target behaviors, (c) design, (d) baseline, (e) sampling behaviors during treatment, (f) raw data record, (g) inter-rater reliability, (h) independence of assessors, (i) statistical analysis, (j) replication, and (k) generalization (see Tate et al., 2008 for description of indicators). Some of the quality indicators were based on the information collected using the coding protocol, but others required the collection of additional information. Each indicator was scored as either 0 or 1 (1 indicating the quality indicator was met). A .5 was given as a score when information was provided for child participants but not for parent participants. To calculate the percentage of quality indicators met, (a) all scores for a study were summed, (b) the sum was divided by 11, and (c) the resulting fraction was multiplied with 100. Based on the percentage obtained, methodological quality of the studies was classified as poor (0–24%), fair (25–49%), good (50–74%), or strong (75–100%).

2.6. Inter-rater agreement for screening, coding, and methodological quality check

Articles were screened and coded by two coders. One coder screened all articles obtained through the search (i.e., 519 abstracts), coded all the studies that met the inclusion/exclusion criteria (i.e., 15 studies), and completed the SCED Scale to determine the methodological quality of the 15 studies. To ensure accuracy and consistency of the screening, coding, and methodological quality check, a second coder independently screened one-third of all abstracts (i.e., 173 studies), coded all 15 studies using the coding protocol, and evaluated the methodological quality of the 15 studies using the SCED Scale. Inter-rater agreement for screening, coding, and quality check was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying the fraction by 100. Inter-rater percentage agreement was 100% for screening, 96% for coding (range = 94–100%), and 95% for quality check (range = 82–100%). Disagreements between coders were resolved by reviewing the articles and discussions.

3. Results

Fifteen studies were located in the extant literature that met the inclusion criteria. The studies were published from 1992 through 2010. Five studies were conducted in the 1990s, nine studies in the 2000s, and one study in 2010. The 15 studies were implemented in three different countries: United States (n = 12), Australia (n = 2), and Canada (n = 1).

Researchers employed several SSER designs across the 15 included studies including a multiple baseline design across participants (n = 11), intervention strategies (n = 1; i.e., environmental arrangements, feedback, modeling the child’s target, and incidental teaching), and communication functions or behaviors (n = 1; e.g., request more, respond to name, and choice making), a multiple probe design across participants (n = 1), and an AB design replicated across participants (n = 1).

3.1. Approaches studied

Across the 15 studies, the researchers trained parents to use six different naturalistic language approaches: milieu teaching (MT; n = 5), pivotal response training (PRT; n = 3), enhanced milieu teaching (EMT; n = 2), blended communication and
Table 1
Definition and procedural components of naturalistic language intervention approaches.

<table>
<thead>
<tr>
<th>Approach</th>
<th>Definition</th>
<th>Procedural components</th>
</tr>
</thead>
</table>
| Milieu teaching                                | A naturalistic, conversation-based approach in which the child's interest in the environment is used as a basis for eliciting elaborated child communicative responses (Kaiser, 1993)                                                                                                                                  | • Arrange the environment  
• Build routines that the child enjoys  
• Encourage spontaneous communication by using "expectant waiting"  
• Wait for the child to initiate interactions by gesturing or indicating interest in a toy/activity  
• Provide prompts and cues for expansion of the child's initiation  
• Reward child responses with access to a toy or activity  
• Provide clear and uncorrected instructions or opportunities  
• Use natural reinforcers to reinforce behavior attempts and approximations  
• Present multiple examples  
• Increase responsiveness to child's verbal behavior  
• Give children an opportunity respond  
• Give simple, clear instructions  
• Increase frequency of instructions  
• Increase positive responses following child compliance and corrective responses following child non-compliance  
• Increase praise  
• Decrease negative verbal responses  
• Provide model of appropriate language  
• Conduct FBA to identify the function of the child's challenging behavior  
• Determine a more desirable form of communication for the child to use as a replacement for the challenging behavior  
• Ignore the challenging behavior  
• Prompt the use of the replacement behavior  
• Use object or activity and praise to reinforce all of the child's verbal attempts  
• Take turn with the stimulus material  
• Use a range of tasks and multiple exemplars  
• Use shared control strategy                                                                 |
| Enhanced Milieu teaching                        | A naturalistic, conversation-based strategy for teaching language and communication skills to children in early stages of language development by combining the principles of milieu teaching and responsive interaction (Hemmeter and Kaiser, 1994)                                                                                           | • Use shared control to increase motivation  
• Use a range of tasks and multiple exemplars  
• Take turn with the stimulus material  
• Use a range of tasks and multiple exemplars  
• Use shared control strategy |
| Pivotal response training                       | An approach developed to promote appropriate social interactions and communicative skills by teaching children to be responsive to multiple cues, improving child engagement, increasing self-management, and self-initiations (Koegel, Koegel, Harrower, and Carter, 1999)                                                 | • Use shared control to increase motivation  
• Use a range of tasks and multiple exemplars  
• Take turn with the stimulus material  
• Use a range of tasks and multiple exemplars  
• Use shared control strategy |
| Blended communication and behavior support intervention | An approach that combines the principles of enhanced milieu teaching and positive behavior support (Delaney and Kaiser, 2001)                                                                                                               | • Balance turns  
• Give children an opportunity respond  
• Increase responsiveness to child's verbal behavior  
• Give simple, clear instructions  
• Decrease frequency of instructions  
• Increase positive responses following child compliance and corrective responses following child non-compliance  
• Increase praise  
• Decrease negative verbal responses  
• Provide model of appropriate language  
• Conduct FBA to identify the function of the child's challenging behavior  
• Determine a more desirable form of communication for the child to use as a replacement for the challenging behavior  
• Ignore the challenging behavior  
• Prompt the use of the replacement behavior  
• Use object or activity and praise to reinforce all of the child's verbal attempts  
• Take turn with the stimulus material  
• Use a range of tasks and multiple exemplars  
• Use shared control strategy |
| Functional communication training               | A approach that involves assessing the function of a behavior through functional behavior assessments (FBA) and then replacing the challenging behavior with a communicative response that serves the same function (Carr and Durand, 1985)                                                | • Use shared control to increase motivation  
• Use a range of tasks and multiple exemplars  
• Take turn with the stimulus material  
• Use a range of tasks and multiple exemplars  
• Use shared control strategy |
| Naturalistic language paradigm                  | A child-initiated approach designed to increase motivation by varying tasks, increase responding by providing direct reinforcers, and enhance generalization through loose structure and multiple exemplars (Koegel and Williams, 1980, Stokes and Baer, 1977) | • Arrage the environment  
• Use object or activity and praise to reinforce all of the child's verbal attempts  
• Take turn with the stimulus material  
• Use a range of tasks and multiple exemplars  
• Use shared control strategy |

behavior support intervention (BCBS; n = 2), functional communication training (FCT; n = 2), and naturalistic language paradigm (NLP; n = 1). A definition and procedural components of each approach is provided in Table 1.

3.2. Attributes of participants

3.2.1. Child participants

Seventy children participated in the studies: 55 male (79.7%) and 15 female (20.3%). Children ranged in age from 16 to 95 months (M = 43.5 months). However, each study included at least one child who was 60 months old or younger at the onset of the study. Information about participating children's ethnic background was provided in one study (Gillett & LeBlanc, 2007). This study was conducted in the United States and included children who were Caucasian (n = 1), Asian-American (n = 1), and African-American (n = 1). All participating children had delays in their language development and 69 had identified disabilities. Disability categories included autism spectrum disorders (n = 29), language impairments (n = 19), Down syndrome (n = 6), spastic quadriplegia (n = 6), pervasive developmental disorder (n = 4), developmental disability (n = 3), cerebral palsy (n = 1), and Asperger syndrome (n = 1). One child in Hester, Kaiser, Alpert, and Whiteman (1995) did not have an identified disability but he was reported to have a 7 month-delay in expressive and receptive language. Children's initial language status were reported in 13 studies: 41 children had expressive language delays (ELD;
<table>
<thead>
<tr>
<th>Citation</th>
<th>Child</th>
<th>Parent</th>
<th>Trainer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Table 2</strong>&lt;br&gt;Attributes of participants.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Citation</strong></td>
<td><strong>Child</strong></td>
<td><strong>Parent</strong></td>
<td><strong>Trainer</strong></td>
</tr>
<tr>
<td></td>
<td>Language status: ELD: at least 10 months Measure: HTLD, GFTA</td>
<td>SES: Mid. (4)-Low (2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gender: 5 boys-1 girl / Age: 17–51 (M = 34)</td>
<td>Disability: Autism (1), PDD (1), Down s. (2), language impairment (1)</td>
<td>Role: 5 mothers-1 father</td>
</tr>
<tr>
<td></td>
<td>Language status: ELD: 7–24 (M = 13), RLD: 5–28 (M = 13); Measure: SICD</td>
<td>Education: High school (2), post high school (3), college (1)</td>
<td></td>
</tr>
<tr>
<td>Hester et al. (1995)</td>
<td>Gender: 5 boys-1 girl / Age: 27–43 (M = 36)</td>
<td>Disability: Down s. (3), developmental disability (2)</td>
<td>Role: 3 mothers</td>
</tr>
<tr>
<td></td>
<td>Language Status: LCD: 7–22 (M = 12), GDD: 10–26 (M = 16), Measure: RLD5-R</td>
<td>Education: Post high school (2), master (1)</td>
<td></td>
</tr>
<tr>
<td>Iacono, Chan, and Waring (1998)</td>
<td>Gender: 4 boys-1 girl / Age: 28–43</td>
<td>Disability: Autism (3)</td>
<td>Role: 3 mothers</td>
</tr>
<tr>
<td></td>
<td>Language Status: GDD: 20–46</td>
<td>Education: High school (1), bachelor (2)</td>
<td></td>
</tr>
<tr>
<td>Kaiser, Hester et al. (1995)</td>
<td>Gender: 2 boys-1 girl / Age: 27–43 (M = 36)</td>
<td>Disability: Language impairment (2), developmental delay (1)</td>
<td>Role: 5 mothers</td>
</tr>
<tr>
<td></td>
<td>Language Status: ELD: 9–15 (M = 12), RLD: 11–15 (M = 13), Measure: SICD</td>
<td>Age: 35–38 years (M = 36)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gender: 3 boys / Age: 40–95 (M = 67)</td>
<td>Disability: Autism (3)</td>
<td>Role: 3 mothers</td>
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<tr>
<td></td>
<td>Language Status: GDD: 20–46</td>
<td>Education: High school (1), bachelor (2)</td>
<td></td>
</tr>
<tr>
<td>Mancil et al. (2009)</td>
<td>Gender: 2 boys / Age: 34–64 (M = 45)</td>
<td>Disability: Autism (3)</td>
<td>Role: 3 mothers</td>
</tr>
<tr>
<td></td>
<td>Language Status: CD: 15–31 (M = 23), Measure: VABS</td>
<td>Ethnicity: Cau. (3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disability: Autism (3)</td>
<td>Education: Bachelor (1), master (2)</td>
<td></td>
</tr>
<tr>
<td>Pivotal response training (PRT)</td>
<td>Gender: 7 boys / Age: 28–56 (M = 46)</td>
<td>Disability: Autism (8)</td>
<td>Role: 5 mothers-3 fathers</td>
</tr>
<tr>
<td>Coolican, Smith, and Bryson (2010)</td>
<td>Language Status: ELD: 6–29 (M = 22), RLD: 8–34 (M = 20), Measure: PLS-4</td>
<td>Education: Minimum 8 grade-level reading ability was required</td>
<td></td>
</tr>
<tr>
<td>Koegel et al. (2002)</td>
<td>Gender: 2 boys-3 girls / Age: 46–67 (M = 54)</td>
<td>Disability: Autism (5)</td>
<td>Role: 5 mothers-4 fathers</td>
</tr>
<tr>
<td></td>
<td>Language Status: Descriptive information provided.</td>
<td>Language Status: Descriptive information provided.</td>
<td></td>
</tr>
<tr>
<td>Symon (2005)</td>
<td>Gender: 3 boys / Age: 34–64 (M = 45)</td>
<td>Disability: Autism (3)</td>
<td>Role: 3 mothers</td>
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<tr>
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<td>Language Status: CD: 15–31 (M = 23), Measure: VABS</td>
<td>Ethnicity: Cau. (3)</td>
<td></td>
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<tr>
<td></td>
<td>Disability: Autism (3)</td>
<td>Education: Bachelor (1), master (2)</td>
<td></td>
</tr>
<tr>
<td>Enhanced milieu teaching</td>
<td>Gender: 3 boys / Age: 25–49 (M = 36)</td>
<td>Disability: Down s. (1), language impairment (1), PDD (1), cerebral palsy (1)</td>
<td>Role: 3 mothers-1 father</td>
</tr>
<tr>
<td></td>
<td>Language Status: ELD: 9–30 (M = 18), RLD: 7–20 (M = 17), Measure: SICD</td>
<td>Age: 30–37 (M = 35)</td>
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<tr>
<td></td>
<td>Role: 2 Trainers</td>
<td>Education: Post high school (3), bachelor (2), master (1)</td>
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</tr>
<tr>
<td></td>
<td>Experience: 1–16 years in parent training</td>
<td>Education: PhD (1), doctoral student (1)</td>
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<table>
<thead>
<tr>
<th>Citation</th>
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<th>Parent</th>
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<tbody>
<tr>
<td>Delaney and Kaiser (2001)</td>
<td><strong>Blended communication and behavior support</strong></td>
<td><strong>Gender: 3 boys-1 girl/Age: 41–47 (M = 43)</strong></td>
<td><strong>Role: 4 mothers</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Disability: Mild language impairment (4)</strong></td>
<td><strong>Age: 24–42 (M = 31)</strong></td>
<td><strong>Education: Master (1), doctoral student (1)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Language Status: GLD: 2–16 (M = 8), Measure: PLS</strong></td>
<td><strong>SES: Low (4)</strong></td>
<td><strong>Experience: Child. w./dis. (5–10 years) and parent training (1–2 years)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Education: Minimum high school diploma (4)</strong></td>
<td><strong>Gender: 3 female</strong></td>
</tr>
<tr>
<td>Hancock et al. (2002)</td>
<td><strong>Gender: 3 boys-2 girl/Age: 38–46 (M = 42)</strong></td>
<td><strong>Age: 20–48 (M = 28)</strong></td>
<td><strong>Ethnicity: Cau. (3)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Disability: Mild language impairment (5)</strong></td>
<td><strong>Ethnicity: AA (4), Ca. (1)</strong></td>
<td><strong>Education: Bachelor (2), master (1)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Language Status: GLD: 2–18 (M = 11), Measure: PLS-3</strong></td>
<td><strong>SES: Low (5)</strong></td>
<td></td>
</tr>
<tr>
<td>Moes and Frea (2002)</td>
<td><strong>Functional communication training</strong></td>
<td><strong>Gender: 2 boys-1 girl/Age: 39–43 (M = 41)</strong></td>
<td><strong>Role: 3 mothers</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Disability: Autism (3)</strong></td>
<td><strong>Language Status: ELD: Significant (2), RLD: Significant (2)</strong></td>
<td><strong>Role: 2 Trainers (researcher)</strong></td>
</tr>
<tr>
<td>Tait et al. (2004)</td>
<td><strong>Gender: 3 boys-3 girls/Age: 16–47 (M = 30)</strong></td>
<td><strong>Disability: Spastic quadriplegia (6)</strong></td>
<td><strong>Gender: 1 female</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Language Status: ELD: 9–36 (M = 20), RLD: 4–45 (M = 16), Measure: REEL-2</strong></td>
<td><strong>Age: 34–38 (M = 36)</strong></td>
<td><strong>Education: Doctoral student</strong></td>
</tr>
<tr>
<td>Gillett and LeBlanc (2007)</td>
<td><strong>Naturalistic language paradigm</strong></td>
<td><strong>Gender: 3 boys/Age: 48–60 (M = 52)</strong></td>
<td><strong>Role: 3 mothers</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Ethnicity: Ca. (1), Asi-A (1), AA (1)</strong></td>
<td><strong>Age: 34–38 (M = 36)</strong></td>
<td><strong>NR</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Disability: Autism (3)</strong></td>
<td><strong>Education: High school (1), master (1), doctoral</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Language Status: Unstable on PPVT-III (2), a few months delay (1)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note.** Language status notes children’s language delay at the onset of the study as range (mean) in months. Age is reported in years for trainers and parents, and in months for children. Numbers in parenthesis are frequencies.


* One child in this study did not have an identified disability.

b Participants with post high school education are those who completed high school and has some college education.
range = 9–45 months), 35 had receptive language delays (RLD; range = 4–45 months), 12 had general language delay (GLD; range = 2–18 months), 5 had language comprehension delay (LCD; range = 7–22 months), and 3 had communication delay (CD; range = 15–31 months). Table 2 shows the characteristics of the child participants by study and approach.

3.2.2. Parent participants
The 74 participating parents included 64 mothers in 15 studies, 9 fathers in 4 studies, and 1 grandmother. Across the studies reviewed, researchers reported information regarding intervention agents' age in 5 studies, ethnicity in 2 studies, socioeconomic status (SES) in 4 studies, and level of education in 11 studies. For the five studies that reported age, parents ranged in age from 20 to 48 years (M = 33 years). Two studies reporting ethnicity of parent participants included 4 Caucasian and 4 African-American parents. In four studies that reported SES, 11 parents were from low SES group and 13 parents were from middle to high SES group. Across the 11 studies, parents' level of education included high school (n = 10), some college (n = 12), associate’s degree (n = 2), bachelor’s degree (n = 13), master’s degree (n = 6), and a doctoral degree (n = 1). In addition, two parents had a medical degree and eight parents had at least eight years of schooling. Table 2 presents background information of parent participants by study and approach.

3.2.3. Parent trainers
Eight studies reported the number of parent trainers participated in the study: a total of 17 individuals delivered trainings to parents. Parent trainers’ gender was provided in four studies (10 female), age in two studies (range = 24–36 years), and ethnicity in one study (3 Caucasian). Level of education was reported for 14 trainers in 8 studies. These included 10 individuals with a master’s degree, 4 with a bachelor’s degree, 4 doctoral students, and 1 individual with doctoral degree. Parent training sessions were delivered individually to each parent by one (n = 6) or two (n = 2) trainers. Table 2 presents information about parent trainers by study and approach.

3.3. Characteristics of parent training programs

3.3.1. Strategies
Description of parent training strategies was provided in 14 studies. Hester, Kaiser, Alpert, and Whiteman (1995) only reported frequency and length of training sessions and did not report the strategies used. A variety of training and follow-up techniques were used in the 14 studies to teach parents to use naturalistic language interventions: verbal or graphical performance feedback (n = 11), family-friendly handouts or manuals describing the intervention strategies (n = 9), verbal presentation (n = 7), video examples (n = 6), modeling (n = 6), role play (n = 5), discussion including problem solving (n = 3), and demonstration with another child (n = 2). In addition, parents in the EMT studies received coaching from the trainers during their implementation. Table 3 presents information about training strategies used by study and approach.

3.3.2. Dosage
Information regarding training dosage was provided in 13 studies. Type of information reported varied across the studies and approaches. A MT study (Mancil, Conroy, & Haydon, 2009) and the NLP study (Gillett & LeBlanc, 2007) did not provide any information about the training dosage. Table 3 shows information about the dosage of training sessions by study and approach.

In MT studies, training sessions lasted 30–60 min (n = 3) and 10 min (n = 1). Total number of sessions required for parents to reach a criterion level of performance reported in one study and ranged 28–86 sessions across parents (Alpert & Kaiser, 1992). PRT studies reported the total number of hour for parent training sessions. The total length of training sessions were 25 h (n = 2; 5 days and 5 h each day) and 6 h (n = 1; 3–2 h training sessions in a two-week period) across the studies.

EMT studies reported the frequency and length of training sessions as well as the total number of training sessions required for parents to reach a criterion level of performance. In both EMT studies, parent training sessions were implemented twice a week for 45 min. In Hemmeter and Kaiser (1994), the total number of training sessions to criterion ranged from 17 to 24 sessions across parents. In Kaiser et al. (2000), each parent received 24 training sessions.

BCBS studies also reported the frequency and length of training sessions, and total number of training sessions required for parents to reach a criterion level of performance. Two 45-min-long training sessions a week were delivered to parents across the studies. In Delaney and Kaiser (2001), the total number of training sessions to criterion ranged from 20 to 35 sessions across parents. In Hancock, Kaiser, and Delaney (2002), each parent received 30 training sessions. FCT studies reported very limited information about the dosage of parent training. Moes and Frea (2002) reported that parents received 1–2 training sessions a week. Parents in Tait, Sigafoos, Woodyatt, O’Reilly, and Lancioni (2004) received a 30-min-long training session each week.

3.3.3. Settings and activities
Across the 15 studies, parent training and parents’ implementation of the naturalistic language interventions occurred in three settings: child’s home (n = 5), a clinic (n = 4), and a childcare center or an early intervention program (n = 3). Three studies were implemented both in a clinic and home or other community settings. Parents implemented the naturalistic language interventions most often during play activities alone (n = 11), followed by play activities and other home routines (n = 2). In two studies, naturalistic language approaches were implemented during naturally occurring activities and routines of the family. Table 3 presents information about settings and activities by study and approach.
Table 3
Study Characteristics.

<table>
<thead>
<tr>
<th>Citation, origin, and quality rating</th>
<th>Study design, setting, and activity</th>
<th>Independent variable (parent training)</th>
<th>Dependent variable</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Milieu teaching (MT) (quality rating = strong: 75%)</strong></td>
<td></td>
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<tr>
<td>Alpert and Kaiser (1992) USA</td>
<td>Multiple baseline across participants</td>
<td>-4 clinic-based training sessions (30–60 min) followed by 15 min home-based play interaction -Strategies: Discussion, handouts, video examples, and demonstration -Descriptive, graphic and verbal feedback provided for 10 min after each home based training sessions</td>
<td>Parent Behavior: Use of model, mand-model, time delay, incidental teaching -Reliability*: 67–100</td>
<td>Parent: 6 mothers learned to apply MT strategies to a criterion (75% correct use in two sessions), generalized use of procedures to a non-training situation and maintained them across three monthly maintenance probes. Session number to criterion: 28–86 Child: Increases on MLU and novel/total words produced observed for all children. An increase in frequency of requests was observed for four children</td>
</tr>
<tr>
<td></td>
<td>-Home</td>
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<tr>
<td></td>
<td>-Play</td>
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<tr>
<td></td>
<td>Rating: 77%</td>
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<tr>
<td></td>
<td>-Clinic</td>
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<td></td>
<td>-Play</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>Parent Behavior:</strong></td>
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<tr>
<td></td>
<td><strong>Delay, incidental teaching</strong></td>
<td></td>
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<tr>
<td></td>
<td><strong>Milieu teaching (MT) (quality rating = strong: 75%)</strong></td>
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<td><strong>Parent Behavior:</strong></td>
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<tr>
<td></td>
<td><strong>Delay, incidental teaching</strong></td>
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<tr>
<td>Hester et al. (1995) USA</td>
<td>Multiple baseline across participants</td>
<td>Training sessions were conducted twice a week and lasted 30 to 60 min</td>
<td>Parent Behavior: Use of model, mand-model, questions, directives, and total utterances -Reliability: M = 80</td>
<td>Parent: 6 parents increased their use of MT strategies to a criterion level of performance (correct use in 80% of the time) and generalized them to home setting Child: 6 children increased their use of language targets, but only 4 generalized their use</td>
</tr>
<tr>
<td></td>
<td>-Clinic</td>
<td></td>
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<tr>
<td></td>
<td>-Play</td>
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<tr>
<td></td>
<td>Rating: 82%</td>
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<tr>
<td></td>
<td>-Clinic</td>
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<tr>
<td></td>
<td>-Play</td>
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<tr>
<td></td>
<td><strong>Parent Behavior:</strong></td>
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</tr>
<tr>
<td></td>
<td><strong>Delay</strong></td>
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</tr>
</tbody>
</table>
Enhanced milieu teaching (EMT)  
*quality rating = strong: 82%*

<table>
<thead>
<tr>
<th>Study</th>
<th>Setting</th>
<th>Training Procedures</th>
<th>Reliability</th>
<th>Child Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemmeter and Kaiser (1994)</td>
<td>USA</td>
<td>-Multiple baseline</td>
<td>M</td>
<td>Parent Behavior: Use of environmental arrangements, feedback, modeling, incidental teaching</td>
</tr>
<tr>
<td></td>
<td>-Clinic</td>
<td>across intervention</td>
<td></td>
<td>Child Behavior: Spontaneous utterances, target use, child enjoyment, receptive communication, expressive communication, and MLU</td>
</tr>
<tr>
<td></td>
<td>-Play</td>
<td>strategies</td>
<td></td>
<td>-Reliability: 77–94 (M = 82)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Parent Behavior: Parent behaviors were identical to those reported in Hemmeter and Kaiser (1994)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-Reliability: 71–100 (M = 90)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Child Behavior: Social communication skills, expressive and receptive communication, and linguistic complexity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-Reliability: 61–98 (M = 77)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Parent: All parents learned to use strategies to criterion levels (70% correct use) in 17 to 24 sessions and generalized their use to home</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Child: Improvements were observed for all children across all skills during training. Generalization was observed for spontaneous target use (n = 4) and total use of targets (n = 4)</td>
</tr>
<tr>
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<td>Parent: All parents demonstrated mastery of the EMT skills and scored above the 80% criterion level</td>
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<tr>
<td></td>
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<td>Child: All children increased use of functional verbal responses and appropriate social communication</td>
</tr>
</tbody>
</table>

Blended communication and behavior support (BCBS)  
*quality rating = strong: 80%*

<table>
<thead>
<tr>
<th>Study</th>
<th>Setting</th>
<th>Training Procedures</th>
<th>Reliability</th>
<th>Child Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delaney and Kaiser (2001)</td>
<td>USA</td>
<td>-Multiple probe</td>
<td>M</td>
<td>Parent Behavior: Use of balance turns, give opportunity to respond, responsiveness to child verbal behavior, simple/clear instruction, positive responses, following child compliance/noncompliance, praise, corrective responses, negative verbal responses, model of appropriate language</td>
</tr>
<tr>
<td></td>
<td>-Child care center</td>
<td>across participants</td>
<td></td>
<td>-Reliability: 0–100 (M = 79)</td>
</tr>
<tr>
<td></td>
<td>-Play</td>
<td></td>
<td></td>
<td>Child Behavior: Verbal and nonverbal turns, spontaneous utterances, diversity of vocabulary, MLU, and compliance and noncompliance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-Reliability: 33–100 (M = 83)</td>
</tr>
</tbody>
</table>

(continued on next page)
<table>
<thead>
<tr>
<th>Citation, origin, and quality rating</th>
<th>Study design, setting, and activity</th>
<th>Independent variable (parent training)</th>
<th>Dependent variable</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hancock et al. (2002) USA Rating: 82%</td>
<td>-AB design replicated across participants -Child care center -Play</td>
<td>-Training procedures were identical to those reported in Delaney and Kaiser (2001) -Fidelity: NR</td>
<td>Parent -Child Behavior: Parent and child were identical to those reported in Delaney and Kaiser (2001) -Reliability: Parent: 72–100 (M = 88) Child: 91–100 (M = 96)</td>
<td>Parent: 5 parents learned the strategies, generalized them to interactions at home, and maintained positive changes 6 months after the intervention. Mothers reached criterion for using each strategy. Session number to criterion was 30 Child: Positive changes were observed for 5 children in all study measures and 3 children generalized their gains from training setting to home</td>
</tr>
<tr>
<td><strong>Functional communication training (FCT)</strong> (quality rating = strong: 75%) Moes and Frea (2002) USA Rating: 59%</td>
<td>-Multiple baseline across participants -Home -Family routines</td>
<td>-Families were seen 1–2 times a week -Strategies: Modeling, direct instruction, and feedback -Fidelity: NR</td>
<td>Parent Behavior: Implementation of FCT strategies -Reliability: NR Child Behavior: Functional communication response and tantrum behavior -Reliability: NR</td>
<td>Parent: Mothers reached 80% criteria on fidelity of implementation Child: Problem behavior reached near zero levels and functional communication responses continued to show an increasing trend for all children. These effects were observed in the generalization probes and follow-up Parent: Mothers’ correct use of the procedures increased and maintained during the follow-up sessions (3 to 6 months) Child: Increases in desired replacement behavior and decreases in corresponding prelinguistic behaviors were observed for all 6 children and effects were maintained during follow-up sessions</td>
</tr>
<tr>
<td>Tait et al. (2004) Australia Rating: 68%</td>
<td>-Multiple baseline across communication functions -Home -Play, meal, social activities</td>
<td>-30 min session each intervention day -Strategies: description of intervention plan, feedback on child’s progress and on implementation of the plan after each session -Fidelity: NR</td>
<td>Parent Behavior: Use of encourage -acknowledge -react -procedure strategies -Reliability: NR Child Behavior: Use of pre-linguistic and replacement behaviors -Reliability: 79–99 (M = 93)</td>
<td>Parent: Mothers’ correct use of the procedures increased and maintained during the follow-up sessions (3 to 6 months) Child: Increases in desired replacement behavior and decreases in corresponding prelinguistic behaviors were observed for all 6 children and effects were maintained during follow-up sessions</td>
</tr>
<tr>
<td><strong>Naturalistic language paradigm (NLP)</strong> (quality rating = good: 73%) Gillett and LeBlanc (2007) USA Rating: 73%</td>
<td>-Multiple baseline across participants -Clinic (2 children) and home (1 child) -Play</td>
<td>-Strategies: Instructions and modeling, rehearsal and feedback -Fidelity: NR</td>
<td>Parent Behavior: Implementation of NLP strategies -Reliability: 80–100 (M = 96) Child Behavior: Vocalization -Reliability: M = 100</td>
<td>Parent: 3 parents learned NLP strategies with an average of 96% (range = 95%–100%) correct implementation in training. Parents’ accuracy remained very high (M = 97.25%, range = 96%–98%) during implementation Child: Increases in spontaneous (n = 2) and prompted (n = 1) vocalization were observed</td>
</tr>
</tbody>
</table>

*Note.* (a) Values reported as reliability are interobserver percentage agreement scores.

*Abbreviations.* MLU = mean length of utterance.
3.3.4. Fidelity

Across the 15 studies, one study focused on BCBS reported fidelity data on the implementation of parent training program (Delaney & Kaiser, 2001). In this study, treatment fidelity data were collected for 20% of all training sessions. For each individual training session, the treatment fidelity was above 85%. Table 2 presents information about fidelity by study and approach.

3.4. Methodological quality

Overall, the percentage of quality indicators met across the studies was 76% (range = 59–91%), indicating a good to strong methodological quality for parent-implemented naturalistic language intervention studies. As shown in Table 3, percentages of the methodological quality indicators met varied across the six approaches: 82% (strong) in PRT and EMT studies, 80% (strong) in BCBS studies, 75% (strong) in MT studies, 73% (good) in the NLP study, and 64% (good) in the FCT studies. With respect to individual quality indicators, we found that majority of the studies (77–100%) met 8 of 11 quality indicators. Only 47% of the studies met the quality indicator related to generalization, 20% met independent assessor indicator, and 7% met statistical analysis indicator.

3.5. Parent implementation and child learning outcomes

3.5.1. Reliability

Interobserver agreement (IOA) percentage scores for parent and child behaviors were provided in 12 and 14 studies, respectively. In addition to IOA, kappa scores were reported for child behaviors in 2 studies, and parent behaviors in 1 study. Overall, across studies reporting IOA, IOA ranged from 33% to 100% for child behaviors and 0–100% for parent behaviors. Table 3 presents parent and child behaviors observed in each study and reliability scores reported for the observation of these behaviors under the dependent variable column.

3.5.2. Parent implementation outcomes

Parent outcomes with respect to acquisition of the skills related to the implementation of naturalistic language intervention approaches during parent training, generalization of these skills to other settings, and maintenance of them over time were investigated by conducting visual analyses and using the information provided by the author(s).

Acquisition: Across the 15 studies, all 74 parents learned the approaches taught during training sessions and applied them while working with their children during play or other activities in the clinic, at home, or other community settings. The frequency or percentage of the correct use of language teaching strategies increased for all 74 parents across 15 studies, only after they participated in training sessions.

Generalization: Generalization data were reported for 39 parents in 8 studies. These included three MT (n = 15), two EMT (n = 10), two BCBS (n = 9), and one PRT studies (n = 5). The only type of generalization data collected was generalization across settings, often from clinic to home or other community settings. Across the 8 studies, authors reported some type of evidence that 38 parents generalized the skills they learned to another setting. A parent in Kaiser et al. (1995) was not able to generalize the use of MT strategies from clinic to home setting.

Maintenance: Maintenance data were reported for 40 parents in 6 studies. Studies included two PRT (n = 17), one MT (n = 6), one EMT (n = 6), one BCBS (n = 5), and one FCT (n = 6) studies. Across the 6 studies, all 40 parents maintained their use of language approaches above their baseline performance during the follow-up conducted 1 to 12 months after the intervention ended.

3.5.3. Child learning outcomes

Impacts of parent’s implementation of naturalistic language intervention approaches on their children’s acquisition, generalization, and maintenance of language skills were also examined using visual analyses and information provided by the author(s).

Acquisition: Positive outcomes associated with parents’ use of naturalistic language interventions were observed for a total of 66 children with disabilities. Three children in two MT studies and one child in a PRT study did not demonstrate an improvement on their language performance measured in the study after their parents implemented the naturalistic language interventions.

Generalization: Data on generalization across settings were reported for 34 children with disabilities across 8 studies. Studies included three MT (n = 12), two EMT (n = 10), two BCBS (n = 9), and one FCT (n = 3) studies. Across the 8 studies, authors reported some type of evidence that 27 children generalized the skills they learned to other settings (e.g., home or community settings). Four children in two BCBS studies and three children in two MT studies did not generalize the skills they learned during training to other settings.

Maintenance: Maintenance data were reported for 25 children in 5 studies. Studies included two PRT (n = 13), two FCT (n = 9), and one MT (n = 3) studies. All 25 children for whom maintenance data were reported maintained the skills they learned during follow-up sessions conducted between 1 to 12 months after intervention ended.
4. Discussion

The purpose of the present review was to examine the empirical literature focused on parent-implemented naturalistic language intervention approaches designed to support language development of young children with disabilities. A total of 15 studies met the inclusion criteria and were analyzed using an investigator-developed coding protocol. Overall, the studies included in this review received a methodological quality rating score of 76% (range = 59–91%), indicating a good to strong quality. All 15 studies reported that parents were able to learn and implement new language teaching approaches with their young children with delays and disabilities. In addition, parents’ implementation of these approaches resulted in positive changes on their children’s language skills.

Six naturalistic language intervention approaches were studied in the literature including milieu teaching (MT; n = 5), pivotal response training (PRT; n = 3), enhanced milieu teaching (EMT; n = 2), blended communication and behavior support intervention BCBS; n = 2), functional communication training (FCT; n = 2), and naturalistic language paradigm (NLT; n = 1). MT was found to be effective in teaching language skills to children who were approximately 40 month olds, had mild language delays (10–16 months), and had a range of disabilities. Results also showed that parents who had high school level education could implement MT approach to support their children’s language development.

PRT was found to be effective for supporting the language development of children with autism who were approximately 48 month olds and had more severe language delays (20–23 months). Parents who implemented PRT varied in their educational background from 8th grade–level education to a master’s degree. EMT was found to be effective for children who were also approximately 40 months old, and had more severe language delays (17 to 23 months) and a variety of disabilities. All parents who participated in enhanced milieu teaching studies had some level of college education.

BCBS studies were effective in supporting language development of children with mild language delays (8–11 months) who were 42 month-old on average. Parents who implemented the intervention had at least a high school diploma and were from low socioeconomic background. FCT studies included the youngest children when compared to studies focused on other approaches. This approach was effective in supporting language development of children who were 34 month-old on average, diagnosed with either autism or spastic quadriplegia, and had significant language delays (16–20 months). Information about parents who implemented the interventions was not provided. NLP approach was found to be effective in supporting language development of children with autism who were 52 month-old, on average. These children had mild to moderate language delays. Their parents who implemented the interventions varied in educational background from a high school degree to a doctoral degree.

The results of the studies included in this review indicate (a) parents can learn and implement several naturalistic language intervention approaches, and (b) when parents use these approaches after receiving training, their children’s language skills increase. While these results clearly indicate an overall positive effect of parent-implemented naturalistic language intervention approaches on their children’s language development, it must be noted here that the research base was small (i.e., 15 studies). The need for additional research in this area is warranted.

Despite the positive findings, we identified several limitations and weaknesses of this body of literature that need more attention in future research. With respect to participants, studies included young children with a variety of disabilities. However, 93% of primary caregivers who implemented the naturalistic language interventions were female and mostly the mothers of participating children. Fathers occasionally participated in the studies as intervention agents. In terms of parent trainers, all were female and had a college degree or higher. In addition, detailed information about the characteristics of study participants was not provided across the studies. Although most demographic information (except ethnicity) was provided for child participants, information provided about parents and trainers was very limited. The majority of studies did not report ethnicity (87%), SES (73%), age (67%), and educational levels (27%) of parents. Similarly, background information for parent trainers was not reported in most of the studies. For example, only 13% of the studies reported age, 27% reported gender, 40% reported previous experience, and 53% reported level of education. This finding is consistent with the findings of Goldstein (2002) who reviewed 60 studies focused on communication interventions for young children with autism and found that most studies provided limited information about the attributes of study participants. Snyder et al. (2014) also reported similar findings in their review of the literature focusing on naturalistic instructional approaches for young children with disabilities. Several researchers emphasized the need and importance of sharing sufficient information about study participants (Goldstein, 2002; Pennington, Marshall, & Goldbart, 2007; Rakap & Parlak-Rakap, 2011; Roberts & Kaiser, 2011; Snyder et al., 2014). Future research should not only include participants who represent a variety of ethnic backgrounds, socioeconomic levels, educational background, and family structures, but also should provide sufficient descriptions of study participants (e.g., ethnicity, age, gender, level of education, years of experience, language abilities). This will allow researchers to identify the attributes of individuals who can train parents, intervention providers who can implement naturalistic language interventions, and the characteristics of children for whom these intervention approaches are effective.

Parent training procedures were described in detail across all studies. However, studies provided limited information about the length, frequency, and duration of the training sessions. Therefore, for almost half of the studies (47%), it was not possible to calculate the total number of training hours required for parents to learn the naturalistic language interventions and implement them with fidelity while working with their children. This finding is consistent with the findings of previous reviews that have examined the reporting of intervention intensity (Snyder et al., 2014; Warren, Fey, & Yoder, 2007). More rigorous description of the training procedures will allow other researchers to replicate the studies and provide
additional information about the effectiveness of naturalistic language interventions. Future research should precisely report the procedures used to train parents and training time and format required for implementing naturalistic language interventions with high fidelity.

The importance of collecting and reporting treatment fidelity data has been emphasized in the literature for over three decades (e.g., Gresham, Gansle, & Noell, 1993; LeLaurin & Wolery, 1992). LeLaurin and Wolery noted that consistent collection and reporting of treatment fidelity data is critical to draw valid conclusions about the relationship between the implementation of an intervention and targeted outcomes. Treatment fidelity data also help researchers to identify features of implementation needed to produce desired outcomes (Snyder et al., 2014). Although most researchers collected reliability data on parents’ implementation of naturalistic language interventions, only one study reported treatment fidelity data on parent trainers’ implementation of training sessions. This finding is consistent with the findings of previous literature reviews focusing on reporting of treatment integrity data (Gresham et al., 1993; Meadan et al., 2009; Roberts & Kaiser, 2011; Snyder et al., 2014). As noted by Roberts and Kaiser, without this information, it is unclear how parent trainings can be best accomplished and which specific strategies are more helpful in improving parents’ skills. Findings of this review suggest the need for improved treatment fidelity data collection and reporting.

In 47% of the studies, parent training and implementation sessions occurred in a play room at a clinic. In clinical settings, caregivers are free from the distraction of daily life and are able focus on learning and implementing specific language intervention procedures. Caregivers who have children with disabilities, however, infrequently have similar conditions within their daily routines (Mobayed, Collins, Strangis, Schuster, & Hemmeter, 2000; Woods, Kashinath, & Goldstein, 2004). Despite some of the studies included home generalization component to the intervention and reported positive results in terms of parents’ implementation, future research must focus on investigating parent-implemented language interventions during naturally occurring home routines, if we truly want parents to use these intervention approaches at home. To help parents implement any given intervention during naturally occurring home routines, researchers should assess families’ daily routines and identify the parameters of the specific activities and routines (Bernheimer & Keogh, 1995; Granlund, Bjorck-Akesson, Wilder, & Ylven, 2008). When features and organization of activities and routines of the families are considered, the intervention will be more compatible with their lives and become more meaningful to them. This, in turn, will help caregivers to use intervention approaches more often and maintain them over time (Bernheimer & Keogh, 1995; Granlund et al., 2008).

With respect to parent implementation and child learning outcomes, findings suggested that training programs were effective in teaching parents to use naturalistic language intervention approaches and parents’ implementation of there approaches resulted in acquisition of targeted language skills for almost all participating children in all studies. Data on generalization and maintenance also revealed that parents were able to generalize the use of naturalistic language approaches to other settings and use them over time. Similar results for children were also found. This findings support the argument that naturalistic language interventions are effective for skill acquisition, generalization, and maintenance. However, it must be acknowledged that only a handful of the studies reported generalization and maintenance data for parent implementation and child learning outcomes. These findings are consistent with those of Hepting and Goldstein (1996), Roberts and Kaiser (2011) and Snyder et al. (2014). Given that primary premise of naturalistic language approaches highlighted in the literature is the enhanced generalization and maintenance of learned skills, there is a need for consistently collecting and reporting generalization and maintenance data.

The current review is delimited by its focus on parent-implemented naturalistic language intervention approaches with young children with disabilities or delays. Only, the studies using a SSER design and providing both parent implementation and child outcome data were included in this review. In addition, the studies published in a language other than English were not included in the present review.

5. Conclusions

Efforts to support language development of young children with disabilities should be a major priority in the field of early childhood special education for at least two reasons. First, over 70% of young children with disabilities have delays in language development. Second, these children are not likely to acquire these skills without receiving language-focused interventions (Tait, Sigafoos, Woodyatt, O’Reilly, & Lancioni, 2004). In order for young children with delays and disabilities to improve their language skills, a continuum of intervention is necessary. Weekly one or two hours of language therapy implemented by a therapist alone may not be sufficient for some children to develop language skills. Therefore, parents’ participation in language interventions is indispensable, not only because children spend a vast amount of their time with their parents, but also high quality parent–child interactions support young children’s language development (Kaiser et al., 1995; Koegel, Symon, & Koegel, 2002).

The results of the present review that included 15 SSER studies indicate that parents’ implementation of naturalistic language intervention approaches is associated with positive language outcomes for children with delays and disabilities. Findings from this review support the findings of previous reviews of group experimental research studies reporting the effectiveness of several parent-implemented naturalistic language intervention approaches (e.g., enhanced milieu teaching, pivotal response training). Moreover, findings of this review show that approaches such as milieu teaching, blended communication and behavior support intervention, and naturalistic language paradigm, that have only been investigated through SSER are promising intervention approaches to support language development of young children with disabilities.
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References

«References marked with an asterisk indicate studies included in this review.
