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BILINGUAL VOCABULARY SUPPORT FOR DUAL
LANGUAGE LEARNERS: A SYSTEMATIC REVIEW

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Structured Abstract

Clinical Question: Would a dual language learning (DLL) child age 2+ years with delayed or impaired vocabulary development (P) show gains in both languages when supplementing intervention in his or her second language (L2) with an indirect speech-language pathologist-supervised or prompted first language (L1) intervention (I) in comparison to no supplemental intervention in the child's home language or no intervention (C) as shown by L1 or L2 vocabulary growth (O)?

Method: Systematic Review

Study Sources: PubMed, ERIC, speechBITE

Search Terms: bilingual intervention language OR bilingual intervention vocabulary OR home-language intervention AND bilingual* OR dual language learn* OR DLL OR preschool child* OR Spanish speak* OR home language OR English language learn*

Number of Included Studies: 3

Primary Results:

1. Young DLLs with low vocabulary skills who are provided with bilingual intervention are capable of expanding their vocabularies in both of their languages.
2. Emerging evidence indicates that monolingual SLPs can promote vocabulary acquisition in young DLLs' home language and majority language.
3. Parent involvement with systematic language stimulation, parent mediated dialogic book reading, and the use of computer-based bilingual presentations appear to be promising ways to implement home language vocabulary goals for monolingual SLPs. All approaches warrant further evaluation with bigger sample sizes, rigorous controlled designs, and diverse populations.

Conclusions: Although there is a growing need for bilingual intervention for DLL preschoolers with delayed or impaired vocabulary acquisition, few studies have examined approaches that can be readily implemented by monolingual SLPs. While emerging trends suggest that strategies implemented by monolingual SLPs can facilitate L2 vocabulary growth with the added benefit of supporting L1 vocabulary learning, monolingual SLPs need more evidence-based recommendations to improve the vocabulary outcomes of the diverse range of DLLs they serve in everyday practice.

Bilingual Vocabulary Support for Dual Language Learners: A Systematic Review

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Clinical Scenario

Linda has been working with young children and their families for the past 16 years as a speech-language pathologist (SLP) in different preschools and kindergartens in a large metropolitan area. Over the years, she has seen a continuous increase in the number of dual language learners (DLLs)—children who speak more than one language as a result of growing up in a bilingual environment—on her caseload. These children are sequential speakers of different first languages (L1), such as Spanish, Punjabi, Urdu, Croatian, Syrian Arabic, Vietnamese, and African dialects, who established their first language in their home environment and started learning their additional language (L2), English, in educational and community contexts.

Many of Linda's DLL clients have low vocabulary skills overall and with the help of an interpreter, some have been identified with language impairment. For these children, Linda's main focus is on expanding L2 vocabulary via focused stimulation techniques. She makes sure to always encourage parents to keep speaking the L1 in their home environment because the development of children's competency in their L1, as well as their L2, plays an important role in children's interpersonal relationships within the family, sense of self, and cultural identity (De Houwer, 2015).

In accordance with the specifications in the American Speech-Language-Hearing Association's (ASHA) Code of Ethics (2016), Linda strives to provide culturally and linguistically appropriate services to her clients and tries to also address L1 vocabulary goals in her intervention sessions. However, because she neither understands nor speaks most of her client's first languages, she is not sure how to address their L1 in her intervention without having professional bilingual collaborators.

Consequently, Linda, similar to many SLPs worldwide, is faced with the question, "How can I effectively facilitate L1 vocabulary acquisition in a language I do not speak myself?" In such cases of linguistic and cultural mismatches between a client and an SLP, Kohnert, Yim, Nett, Kann,

and Duran (2005) suggest including family members, peers, or other community members in the intervention process. Linda wanted to find out details on such approaches to guide her service delivery modality decision making; she set out to review the research literature to see what indirect approaches were available to promote L1 vocabulary acquisition in addition to supporting the L2 of DLLs age 2+ years with vocabulary deficits. She also wanted to find out if available approaches would be effective in addressing the vocabulary needs of her clients.

Background Information

DLLs with delayed or impaired vocabulary skills.

Quantity, quality, and timing of language exposure influence children's language acquisition. Growing up with multiple languages does not impede child rearing and academic achievement (McLeod, Harrison, Whiteford, & Walker, 2016), but rather has been connected to cognitive and social advantages (Bialystok, 2009; Blom, Boerma, Bosma, Cornips, & Everaert, 2017; Fan, Liberman, Keysar, & Kinzler, 2015). However, just like monolingual children, DLLs may exhibit low vocabulary skills at preschool age and/or be affected by language impairment (LI).

The impact of vocabulary knowledge on children's early literacy and later reading outcomes has been firmly established for both monolingual children and DLLs (August, Carlo, Dressler, & Snow, 2005; Lesaux & Kieffer, 2010; Proctor, August, Carlo, & Snow, 2006; Storch & Whitehurst, 2002). Given these strong connections, low vocabulary skills at preschool or kindergarten age put DLLs at risk of academic difficulties. At-risk children include those who display delayed vocabulary development and/or are identified with LI.

There is evident need to promote proficiency in the majority language. Simultaneous support is warranted for young DLLs' L1: Besides offering cognitive, academic, and vocational advantages of bilingualism, proficiency in their home language is socially-emotionally important because it allows the development of closer family relationships and supports the development of sense of identity (De Houwer,

2015; Thordardottir, 2010). On the flip side, a lack of home language support can result in incomplete language acquisition, regression, or loss (Håkansson et al., 2003), which may, in turn, negatively affect the acquisition of subsequent languages and thus place children with low vocabularies and/or LI at an additional developmental risk (Kohnert, 2010).

Bilingual vocabulary intervention. Research studies on bilingual vocabulary intervention for DLLs are limited. Emerging evidence suggests that an intervention that addresses both of the child's languages offers different potential benefits, including the creation of a positive learning environment that values his or her L1 and allows the child to build on his or her entire knowledge base (Thordardottir, Weismer, & Smith, 1997). Although monolingual intervention will only promote vocabulary growth in the targeted language, bilingual intervention can achieve similar L2 language outcomes as L2-only intervention, with the added benefit of L1 support (Restrepo, Morgan, & Thompson, 2013).

Kohnert and Medina (2009) conducted a review on bilingual treatment studies delivered by bilingual interventionists. In addition to the advantages of continued L1 support, the combined finding of the three identified experimental studies comparing L1 to L2 treatment outcomes in children with language impairment was that L2 vocabulary improved in both monolingual and bilingual treatment conditions. Additionally, emerging evidence suggests that L1 treatment paved the way for faster L2 vocabulary learning.

Furthermore, in a recent systematic review of the literature, Durán, Hartzheim, Lund, Simonsmeier, and Kohlmeier (2016) analyzed the effectiveness of bilingual and L1 language and literacy interventions for children with LI and those at risk for LI (e.g., Head Start participants). Overall findings of 26 studies included in the review indicate that bilingual or L1 interventions may promote home language growth (small to medium effect sizes) and do not negatively affect growth in the majority language.

Many of these studies show that if an SLP and his or her DLL client share a common first language, the SLP may directly deliver a bilingual intervention (e.g., Ebert, Kohnert, Pham, Disher, & Payesteh, 2014; Thordardottir, 2010; Thordardottir et al., 1997). Another option is for the SLP is to deliver his or her intervention indirectly by consulting and/or training an intervention partner, such as a bilingual SLP aid, a bilingual preschool teacher, or an

interpreter, to implement language intervention strategies. In the absence of a professional bilingual collaborator, Kohnert and colleagues (2005) suggest targeting L1 goals indirectly by collaborating with parents, siblings, peers, other community members, or the use of technology.

Bilingual service delivery in light of cultural and linguistic mismatches. Young DLLs are one of the fastest growing populations, not only in the United States (U.S. Census Bureau, 2010; U.S. Department of Health and Human Services, 2013), but also in large European countries such as Germany (Statistisches Bundesamt, 2016). As the populations of immigrants, refugees, and other DLLs increase internationally (Connor, Cohn, & Gonzalez-Barrera, 2013), SLPs face the challenge to deliver speech and language services to a growing and diverse population of DLL clients. With ongoing and escalating global conflicts, unstable economies, and persecution of minority groups, developed countries in North America and Europe can continue to expect high numbers of immigrants and refugees (United Nations High Commissioner for Refugees, 2015) who speak a multitude of different languages.

Although there is a strong and growing body of evidence supporting bilingual vocabulary services delivered by bilingual interventionists, service delivery is often complicated because there is a shortage of bilingual service providers in terms of both quantity and cultural and linguistic backgrounds. Of the only 6% of ASHA members who identified themselves as bilingual SLPs, the majority were Spanish-language service providers (ASHA, 2017). Therefore, to deliver linguistically and culturally appropriate services to all DLL clients and address L1 targets, indirect methods to support their home language become increasingly critical.

Clinical Question

To guide her search for external evidence, Linda developed her search terms based on the PICO format (patient/problem, intervention, comparison, outcome; Dollaghan, 2007; Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000), namely: Would a DLL child age 2+ years with delayed or impaired vocabulary development (P) show gains in both languages when supplementing intervention to his or her L2 with an indirect SLP-supervised or prompted L1 intervention (I) in comparison to no supplemental intervention in the child's home language or no intervention (C) as shown by L1 or L2 vocabulary growth (O)?

Search for the Evidence

Inclusionary and exclusionary criteria. To ensure maximal inclusion of potential evidence and maintain consistency with the PICO question stated, studies published from 1950 to June 2017 were considered eligible for the review if they met the following criteria: (a) published in a peer-reviewed journal and written in English with the full text available, (b) described in sufficient detail that it could potentially be replicated and contained original data related to the research questions, (c) focused on investigating an indirect intervention targeting L1 vocabulary where child participants were preschool-age or kindergarten-age DLLs who demonstrated delays or impairments in both languages, (d) reported specific child-related outcomes for vocabulary, and (e) based on SLP-directed training, support, feedback, and/or monitoring.

Studies were omitted if (a) either a bilingual SLP or a trained bilingual research assistant was the primary agent of service delivery, (b) the intervention did not target vocabulary development, or (c) the study population consisted of DLLs with age-appropriate vocabulary development.

Search strategy and categorization process. A systematic search of three major databases, namely PubMed, ERIC, and speechBITE, was conducted in July 2017. Table 1 lists the search terms and root words that were used in combination to locate relevant articles.

The initial search yielded 762 journal abstracts. After duplicates from search results across all databases were removed, a screening of the remaining potential studies was conducted, which included a review of abstracts to determine whether they met the inclusion criteria. If the article did not suggest both L1 and L2 support strategies in the title or abstract, it was removed from the list of articles. Through this preliminary screening, 17 articles were identified and the full text was obtained and further screened for the inclusionary criteria. Fourteen additional articles were eliminated because the intervention was not conducted in the participants' L1 ($n = 2$), the intervention was delivered by a bilingual service provider ($n = 4$), vocabulary was not targeted in the intervention ($n = 3$), or because participants were outside the age range established for this review ($n = 2$). Three more articles were eliminated because they presented reviews of the bilingual intervention literature rather than original data.

Because of the heterogeneity of terminology for this topic area, an additional bibliography search was also

conducted based on relevant reviews (Durán et al., 2016; Kohnert & Medina, 2009) and bibliographies from all included articles. Full texts were retrieved for two additional articles, but not included in the final corpus, because bilingual service providers delivered the interventions.

Evaluating the Evidence

The search process for external evidence generated three articles for in-depth evaluation because they most closely matched the inclusion criteria (Pham, Kohnert, & Mann, 2011; Thordardottir, Cloutier, Ménard, Pelland-Blais, & Rvachew, 2015; Tsybina & Eriks-Brophy, 2010). Table 2 summarizes the study design, including a description of the participants, intervention details, and language outcomes.

Summaries of Studies. The studies included a total of 42 DLLs from ages 22 to 68 months who were exposed to their L1 at home and to their L2 in a setting outside the home (e.g., preschool). Research designs included a single-subject study, a nonrandomized trial, and a randomized controlled trial. Although all studies utilized individualized intervention designs, one study presented an LI computer-based intervention in the preschool setting (Pham et al., 2011), and two studies worked with parents as intervention agents (i.e., one study was based on a parent-mediated vocabulary intervention in a clinical setting; Thordardottir et al., 2015), and one study presented a parent-implemented dialogic book-reading in the children's homes (Tsybina & Eriks-Brophy, 2010). Two of the identified studies included DLL children with LI, whereas Tsybina & Eriks-Brophy (2010) focused on children with vocabulary delays as established by parent report. The intervention intensity (i.e., the interplay of the frequency, dose, and duration of the intervention; Warren, Fey, & Yoder, 2007) included a wide range between the studies (e.g., duration = 3 weeks to 16 weeks; total dosage = 120 minutes to 450 minutes). Finally, all of the studies chose change in L1 and L2 vocabulary knowledge as one of the outcome measures, as assessed by researcher-developed curriculum-specific vocabulary probes and, in the study by Thordardottir et al. (2015), also in mean length of utterance in words (MLUw).

Quality Indicators. To help evaluate the overall design of each study as well as the clinical relevance of outcomes, all studies were evaluated globally on the basis of 11 quality indicators adapted from Cirrin and Gillam (2008), Durán et al. (2016), and Dollaghan's Critical Appraisal of Treatment Evidence (CATE, 2007). The quality indicators

referred to the following areas: inclusion of a comparison control group, random assignment, participant information, initial group similarity, intervention description, fidelity of intervention, blinding, nuisance variables, validity and reliability of measures, statistical significance, and practical significance (see Table 3 for a description of each criterion). The quality indicators were assessed on a dichotomous basis; a check mark indicated that a quality indicator was met, whereas a dash indicated that a quality indicator was not met. Because some of the indicators did not apply to the single-subject study, NA (not applicable) was indicated when necessary. Table 4 summarizes the extent the included studies met respective quality indicators.

Evaluations of Included Studies. The publication with the highest level of evidence featured a randomized controlled trial and was authored by Thordardottir and colleagues (2015). Participating children were approximately five years old, had a previous diagnosis of developmental language disorder (DLD), and were simultaneous or successive DLLs of French and other varying home languages. All children were randomly assigned to either a monolingual intervention group, a bilingual intervention group, or an untreated control group. In both treatment conditions, children were seen individually (with a parent present) for 16 sessions. Vocabulary training for each child involved five words (verbs and nouns) that the child comprehended but did not produce and five words that the child neither comprehended nor produced. In each of the 50-minute sessions, a monolingual clinician addressed the vocabulary goals for approximately 20 minutes within preplanned focused play. In the bilingual condition, parents were asked to actively participate by engaging in the play, modeling the target words in their native language, and responding to their child's L1 utterances. Significant L2 treatment gains were comparable in both intervention groups and were maintained at a two-month follow-up. L1 gains were only measured in terms of MLUw rather than vocabulary and no significant pretest to posttest changes emerged. A lack of L1 vocabulary measures precluded a direct comparison of L1 and L2 gains. Although the study scored high on the quality indicator points (10 out of 11 possible points), it should be considered that the groups' expressive vocabulary score (researcher-developed probe) differed at pretest (the untreated control group's mean score was significantly higher than that of the monolingual treatment group at pretest).

The study with the second highest level of evidence was built on a delayed-treatment control group design. Tsybina & Eriks-Brophy (2010) conducted a dialogic book-reading intervention to promote vocabulary learning in Spanish-English DLLs ages two to three with delayed vocabulary acquisition. Participants received English dialogic book-reading provided by a monolingual SLP paired with Spanish dialogic book-reading delivered by their previously trained mothers. Target words were chosen per language and consisted of three unknown verbs and seven nouns. At posttest, the intervention children produced significantly more target words in both languages [an average of 6.7 targets (range 5–9) in English and an average of 3.2 targets (range 0–6) in Spanish] than the no-treatment control children. No generalized effect on overall vocabulary acquisition in either language was found. Only five out of 11 possible quality points were assigned. The design was flawed, insofar as participant assignment was not randomized and groups were not similar. Although intervention procedures were sufficiently described, fidelity of implementation was not adequately assessed.

Finally, Pham et al. (2011) used an experimental single-subject design to support vocabulary learning in a 4-year-old DLL boy who spoke Vietnamese and English and who was previously diagnosed with language impairment. Target words were eight adjectives unknown to the child in both languages. Four words were targeted in an L2-only condition, whereas the other four were taught in a bilingual condition. The intervention was conducted throughout the preschool day and delivered by the subject's monolingual special-education teacher who sat next to the child and played a PowerPoint™ presentation that included pictures and prerecorded audio files in his L1 and L2. Results showed that the participant established picture-word mapping for new receptive vocabulary in both his L1-only and the bilingual condition.

The study received a low-quality score (4 points), but it should be noted that a selection of quality indicators did not apply to the single-subject design of the study. Therefore, the standards for evaluating single-subject research, as recommended by Horner and colleagues (2005), were applied for a more in-depth assessment of the quality of the research evidence. A baseline measurement of the target behavior was included in the study. The intervention conditions were described briefly but clearly. Because of the computer-based intervention approach, intervention fidelity was likely met; criteria for social validity were also

met, because the dependent variable was socially important. In addition, the intervention was cost effective, and was successfully implemented in typical physical and social contexts (i.e., the preschool environment). However, with only one subject participating, the study lacked experimental control/internal validity because it did not meet Horner et al.'s (2005) recommendation of a minimum of three replications of effect. Overall, the level of evidence that was provided was weak.

Finally, it is worth mentioning that none of the studies included a standardized measure of L1 treatment gains, although this is not necessarily because of design flaws. For example, Thordardottir et al.'s (2015) participants spoke 13 different home languages, among those many for which no standardized test instruments are available (e.g., Urdu, Sinhalese, and Kabyl). Although this issue is not going to be quickly resolved over the next few years, researchers and practitioners can supplement self-designed vocabulary probes with spontaneous language sampling to improve outcome measures (e.g., Gutiérrez-Clellen & Simon-Cerejido, 2009; Kapantzoglou, Fergadiotis, & Restrepo, 2017).

The Evidence-Based Decision

This review was undertaken to answer the following clinical question developed using the PICO format: Would a DLL child age 2+ years with delayed or impaired vocabulary development (P) show gains in both languages when supplementing intervention to his or her L2 with an indirect SLP-supervised or prompted L1 intervention (I) in comparison to no supplemental intervention in the child's home language or no intervention (C) as shown by L1 or L2 vocabulary growth (O)?

Linda identified three studies that included participants who were comparable to her clients: 1) they were similar in age, 2) they had an environmental separation between their L1 and L2, and 3) they displayed vocabulary difficulties in both of their languages. After reviewing the studies, Linda was initially disappointed that the available evidence was very limited. Instead of finding a large corpus of high-quality studies, only two group-design studies and one single-subject study met her PICO criteria. Only one of those studies, Thordardottir et al. (2015), had a randomized design with matched control groups. The intervention models applied were limited to a technology-based approach and parent mediation. However, through her review, Linda

was confident that integrating L1 vocabulary was not only feasible for herself as a monolingual SLP but also beneficial to L2 vocabulary learning. Despite the overall variations in research design, the participants' linguistic and cultural backgrounds, the setting, the intervention approach, and the treatment intensity, all approaches yielded positive effects. In addition, the featured intervention methods would be easy to implement, cost-effective, and feasible in most clinical settings. Overall results were comparable to previous research on bilingual intervention delivered by bilingual interventionists: A bilingual approach could facilitate L2 vocabulary growth with the added benefit of supporting L1 vocabulary learning. Although this was true for specifically targeted words in the intervention, the studies did not provide evidence for a generalization of effects on overall L1 and L2 vocabulary. It remains to be seen if this issue results from a lack of statistical power because of the small sample sizes. Future research will need to use larger groups and rigorous controlled designs to replicate found effects and to investigate potential generalized vocabulary benefits.

Although there was no strong evidence base to support any one certain strategy for a monolingual SLP to utilize with DLLs, the review of evidence did provide several potentially promising methods that could work as a guideline for Linda's service delivery modality decision making. In addition to needing replication within a carefully controlled study, a clear advantage to the technology-based bilingual treatment presented in Pham et al. (2011) is that vocabulary goals are not—at least partly—outside of the clinician's control. In contrast to parent-implemented strategies, the inclusion and frequency of target words could be easily controlled. Also, from Linda's experience, many children are motivated by using technology in the intervention process; however, she thinks the interaction is too limited because it mainly consists of corrective feedback and praise.

Linda learned about a strategy of parent mediation from Thordardottir et al.'s (2015) study that she could easily incorporate in her own practice. As a first step, she scheduled afternoon therapy sessions so that interested parents could not only observe, but actively participate and include L1 elements through repetition and modeling. This way, Linda hoped to also learn some of the targeted words herself. Despite design flaws, Tsybina and Eriks-Brophy's study (2010) inspired Linda to include dialogic book-reading strategies in some of her sessions and to create handouts, so that parents could observe and learn strategies to use at home to supplement L2 vocabulary intervention with L1 input.

Although Linda appreciated the potential benefits of strengthening her parent partnerships and teaching the parents techniques that they could use to systematically support their child's L1 skills, she was also aware that the successful implementation of parents as intervention agents is not necessarily guaranteed. For example, Thordardottir et al. (2015) discussed that some parents appeared to feel uncomfortable taking an active role in the therapy activities and that some SLPs felt challenged by frequently prompting parents' participation while simultaneously targeting L2 vocabulary goals. Tsybina and Eriks-Brophy (2010) reported smaller gains in children who learned L1 words as targeted by their mothers in comparison to L2 vocabulary as targeted by the SLP. Descriptively, children of single mothers who had a low level of education learned the least L1 words.

Working with families facing multiple challenges related to poverty, language, and migration is a clinical reality for Linda; she decided to use a case-by-case basis system when choosing a parental participation strategy. Children of parents who feel uncomfortable directly participating in intervention sessions may benefit from parent coaching in communication and dialogic book-reading strategies to be used independently at home. For children of parents who struggle with independently implementing these strategies, working together with the SLP within the therapy session to create a bilingual intervention environment may be the better choice.

Author Note

Ulla Licandro, PhD, is a speech-language pathologist and a visiting professor at the University of Oldenburg. Her research and teaching focus on intervention and assessment for children with developmental language disorders. Specific research interests include the language acquisition of dual language learners in social contexts (e.g., peer interactions) and how to design and deliver appropriate language interventions for this population.

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Table 1. Systematic Review Search Terms

	Bilingual intervention	DLL
Keywords utilized	bilingual intervention language, bilingual intervention vocabulary, home-language intervention	bilingual*, preschool child*, dual language learn*, DLL, Spanish speak*, home language, English language learn*

Table 2. Summary of Articles Selected for Review

Study	Pham et al. (2011)	Thordardottir et al. (2015)	Tsybina & Eriks-Brophy (2010)
Participants	<i>N</i> = 1 boy Age: 52 months Language profile: moderate to severe language delay (only descriptive language profile provided)	<i>N</i> = 29 (3 girls) Age: 45–68 months (<i>M</i> = 59.56 months) Language profile: primary language impairment (previous clinical identification at or below -1.5 <i>SD</i> on a French language test)	<i>N</i> = 12 (2 girls) Age: 22–42 months (<i>M</i> = 27.8 months) Language profile: at risk for vocabulary and language difficulties (parent concern; small conceptual vocabularies as established by parent report)
Linguistic/cultural background	Home language (L1): Vietnamese Majority language (L2): English Location: Midwest USA	Home languages (L1): Arabic, Bangla, Bengali, Chinese, Dutch, English, Japanese, Kabyl, Punjabi/Urdu, Russian, Sinhalese, Spanish, Tamil Majority language (L2): French Location: Western Canada	Home language (L1): Spanish (Middle and South American) Majority language (L2): English Location: urban area, not specified
Intervention details	Treatment: receptive vocabulary (8 adjectives), bilingual (BI) approach vs. English-only (EO) Control: not applicable Location: quiet corner of the special-education classroom Intensity: frequency and duration: 12 sessions in 3 weeks (2 days/week, 2 times/day); dose: 10 min; duration: 3 weeks; total dosage: approx. 120 min	Treatment: individual language intervention (focused stimulation approach): bilingual intervention (<i>n</i> = 9) Control: L2 monolingual intervention only (<i>n</i> = 11) or no treatment (<i>n</i> = 9) Location: clinical setting, not specified Intensity: frequency and duration: 16 weekly sessions; dosage: 20 min allocated for vocabulary intervention; total dosage (vocabulary): approx. 320 min	Treatment: dialogic book-reading in Spanish and English (<i>n</i> = 6) Control: no treatment (delayed treatment, <i>n</i> = 6) Location: children's homes Intensity: frequency and duration: 30 sessions over 6 weeks; dosage: 15-min sessions in each language; total dosage: approx. 450 min
Implementation of home language	Interventionist: monolingual (English) special-education teacher using a PowerPoint presentation to show L1 and L2 pictures and prerecorded audio files	Interventionists: monolingual (French) SLPs providing instructions, demonstration, and modeling for parents within sessions; parents were asked to model the target words in their language and to respond to their child's home-language utterances	Interventionists: monolingual (English) SLP (dialogic book-reading) and mothers (Spanish dialogic book-reading); mothers received ~30 min of training and a Spanish language handout on dialogic book-reading; the SLP provided modeling in English and monitored practice in Spanish including weekly follow-up observations and feedback
Vocabulary outcomes	L1 & L2: receptive vocabulary probes of words unknown in both languages at baseline: both BI approach and EO increased L1 and L2 receptive vocabulary	L1: Pre-/post-assessment: language sampling: no group differences in mean length of utterance in words (MLUw) L2: Pre-/post-assessments: receptive and expressive vocabulary probes (informal): significant treatment effect for monolingual and bilingual treatment conditions; formal language tests: no group differences; language sampling: no group differences in MLUw; 8-week follow-up (receptive and productive vocabulary only): maintenance of performance	L1 & L2: expressive vocabulary probes at posttest: children in the intervention group produced more target words in each language; 6-week follow-up: maintenance of performance; overall vocabulary gains did not differ between intervention and control group
Design	Single-subject, experimental	Randomized controlled trial	Quasiexperimental/nonrandomized controlled trial

Table 3. Critical Appraisal of Quality for Included Studies

Parameter	Criterion
Comparison control group	Did the study include a control group and one or more treatment group(s)?
Random assignment	Were the participants randomly assigned into the treatment and control group(s)?
Participants	Did the authors provide information about the age, gender, race, ethnicity, socioeconomic status, language input, speech and language abilities, and/or cognitive status of the children who participated in the study?
Initial group similarity	Did statistical analysis demonstrate that the groups were the same in all important ways except for the treatment under investigation?
Intervention description	Was the intervention described in sufficient detail to support replication?
Fidelity of intervention	Was the fidelity of implementation of the intervention adequately reported and were acceptable levels (> 80%) achieved?
Blinding	Was blinding used to ensure that the individuals who conducted the assessments and analyzed the data did not know which groups the participants were assigned to?
Nuisance variables	Were nuisance variables that could have seriously distorted the findings adequately addressed?
Measures	Were the formal and informal measures used to assess the treatment outcomes valid and reliable?
Statistical significance	Did the authors report <i>p</i> values for all dependent variables?
Practical significance	Did the authors report <i>Eta squared</i> values or standardized <i>d</i> values for all dependent variables? If not, could they be calculated from the data that were provided in the article?

Table 4. Summary of Quality Indicators for Included Studies

	CG	RA	P	SG	ID	FOI	BL	NV	M	SS	PS	Number of quality indicators (max. = 11)
Pham et al. (2011)	—	NA	✓	NA	✓	✓	NA	—	✓	NA	—	4
Thordardottir et al. (2015)	✓	✓	✓	—	✓	✓	✓	✓	✓	✓	✓	10
Tsybina & Eriks-Brophy (2010)	✓	—	✓	—	✓	—	—	—	—	✓	✓	5

Note. A check mark indicates that evidence was present. A dash indicates that evidence was not present. CG = comparison control group; RA = random assignment; P = participants; SG = similar groups; ID = intervention description; FOI = fidelity of implementation reported; BL = blinding; NV = nuisance variable addressed; M = measures used; SS = statistical significance; PS = practical significance; NA = not applicable because of the study's single-subject design.