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EVIDENCE-BASED PRACTICE FOR BILINGUAL
STUDENTS WITH LANGUAGE IMPAIRMENT:
GENERAL AND SPECIFIC TREATMENT QUESTIONS

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Evidence-Based Practice for Bilingual Students With Language Impairment: General and Specific Treatment Questions

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Julia is a speech-language pathologist (SLP), working in a K–8 elementary school in a large urban school district. In the past five years, the school's Somali population has more than doubled from 20% to 45% of enrollment due to new refugee arrivals and movement between states for family reunification and employment opportunities. Julia's school is located in a large Somali community. Most of these students learn Somali as their first language (L1) and English as their second language (L2), beginning with immersion in formal educational programs. Somali is the primary language used in the home, though English is the language of instruction at school.

In a nationwide survey, more than 70% of SLPs surveyed in both 1990 and 2001 listed "Treatment Procedures and Materials" for English Language-Learner (ELL) students as a continuing education need (Roseberry-McKibbin, Brice, & O'Hanlon, 2005). Julia, like other SLPs, wants to provide the most effective and efficient intervention possible, knowing time is of the essence for students with disabilities. Her goal is to enable her students' success by building and bridging Somali and English communication skills for home, community, and school settings. Julia's research has focused on monolingual English-speaking students with impairments. To facilitate high-quality intervention, Julia uses three sources of information: 1) the best available scientific data (external evidence), 2) clinical expertise (internal evidence), and 3) client preferences and values (internal evidence). To illustrate, Julia focused on Abdi, a 6-year-old Somali and English-speaking student, to formulate the clinical question that guided her EBP.

Case Background Information

Abdi is difficult to understand in Somali and uses only two- to three-word utterances in combined Somali-English. Abdi and his family came to the U.S. when he was 18 months old. Prior to arriving in the U.S., Abdi was briefly exposed to Swahili in Kenyan refugee camps, but his family and community in the camps spoke only Somali. His family continues to report their primary home language as Somali, although some Arabic is spoken for religious reasons. Because Abdi's mother speaks limited English, she worries about her ability to parent and help Abdi learn if his Somali does not improve. She does not believe his exposure to Swahili and Arabic caused his language to develop slower than his brothers' and cites the older brothers as examples of typical language development under similar circumstances. Abdi's mother wonders what role arriving in the U.S. at later ages may have played in her older sons' bilingual development. His mother reported that Abdi enjoys playing with a 4-year-old, neighbor who is bilingual in Somali and English.

Abdi was not identified with any special learning needs prior to his kindergarten experience, but his mother suspected learning issues early in his development. Abdi did not see a primary-care doctor prior to the district's preschool screening. He was recently identified as having receptive and expressive language impairment. During the evaluation, Abdi's mother and teacher reported that he had significant difficulty understanding directions and producing sentences to communicate his needs. Abdi is becoming increasingly aggressive when his mother or siblings do not understand him.

One third of the students in Abdi's class are bilingual in Somali and English. Abdi is unable to follow directions or to respond to peer requests without individual assistance, repetition, or modeling from the classroom bilingual paraprofessional. It is difficult for Abdi to complete academic tasks independently. His classmates have various levels of English proficiency. They speak to Abdi in both Somali and English and Abdi responds in both Somali and English. Abdi is more successful in small-group learning versus whole-group learning situations, and when he is the "classroom helper." His teacher believes his learning is very different from his bilingual classmates. After discussing this with his mother, the teacher referred Abdi to the evaluation team.

Formulating Clinical Questions

Julia hypothesized that an intervention plan targeting action vocabulary (verbs) would lead to increased functional communication success for Abdi. Julia bases this hypothesis on her clinical experience, in which intervention for action concepts not only increased students' comprehension of directions containing those concepts, but also provided a base from which syntax expanded. She also found research on language impairment in older monolingual children that reported positive results for improving English verb-sentence structure, using explicit instruction and visual cues to represent how parts of a sentence can be manipulated and combined to form longer utterances (Ebbels, van der Lely, & Dockrell, 2007). From consultation with Somali staff and online searches on "Somali Grammar," Julia knows verbs can also be manipulated and expanded in Somali, though possibly in a different word order than in English.

Julia is cautious about planning intervention for Abdi, as well as other bilingual learners, because her clinical experience and research has been only with monolingual, English learners. She posed these clinical questions and searched the literature database:

1. In general, is there evidence available to support the use of both languages for intervention of language impairments in bilingual learners?

2. More specifically, what evidence is available for increasing comprehension of and expanded utterances related to action vocabulary for bilingual children with language impairments?

The Evidence-Based Practice Process

Julia sought the answer to her clinical question by following a 5-step EBP process: (1) finding and evaluating external evidence, (2) evaluating internal clinician evidence, (3) evaluating internal client evidence, (4) making a clinical decision based on the integration of the external and internal evidence, and finally, (5) evaluating the success of the clinical decisions through ongoing monitoring.

Step 1: Finding and Evaluating the External Evidence

Julia began her search for scientific evidence in treatment studies published on bilingual students with language impairment. She explored two online databases, the ASHA/HighWire website (members only) and Education Resources Information Center (ERIC). Julia used the following keyword combinations in the articles "Abstract/Title" search for ASHA and "Keyword" search for ERIC in June 2009: *child, bilingual, ESL, ELL, second-language-learning, minority language, language, intervention, treatment*. Only studies with original data, for children (pre-kindergarten through elementary ages) with spoken language impairment, were included in the review. Subjects could be bilingual in any world languages, but with results published in English. Though an electronic search averaged a dozen peer-reviewed citations, Julia eliminated duplicates, studies without original data, and studies that were not relevant to her clinical question.

The remaining three citations were relevant to language intervention for bilingual learners and focused on vocabulary learning, though this was not Julia's only focus in her search for scientific articles. Julia's literature search results from the ASHA database are listed in Table 1. The results from her ERIC search are listed in Table 2. The low number of citations was consistent with the recent review by Kohnert and Medina (in press), which documented four intervention studies for bilingual learners, including a case study by Seung, Siddiqi, and Elder (2006) that describes treatment gains for a Korean-English speaking child with autism.

If and how Julia can use data from the three studies to make clinical decisions depends on the level of evidence for each study. The level of evidence refers to the ranking system used to evaluate studies, with the assumption the highest-ranked studies include reliable and valid experimental designs with replicable results. Gillam and Gillam (2006) offer a guide for evaluating the level of evidence ranging from the highest to lowest levels: randomized clinical trials (RCT) or a systemic review of RCTs (Level 1); nonrandomized group studies, multiple-baseline design, or systematic reviews of those studies (Level 2); multiple case studies that received the same intervention (Level 3); single case studies (Level 4); and expert opinion (Level 5).

For Julia's case, no Level 1 evidence is available; therefore, she will evaluate the best evidence possible: one Level 2, one Level 3, and one Level 4 study. The evaluation of the three studies is presented in Appendix A, following the format presented by Law and Plunkett (2006). All three studies reported gains from pre- to post-measures. Based on this summary, Julia feels Abdi (and others on her caseload) may benefit from the intervention methods used in the studies.

In the Level 2 study, Perozzi and Sanchez (1992) conducted a comparison study for vocabulary learning in two groups of bilingual children with language impairment. Group A received instruction in Spanish followed by English and group B received English only. In the Level 3 study, Perozzi (1985), studied vocabulary learning for 6 participants (3 bilingual) using a within-subject AB–BA design (condition A received instruction in Spanish followed by English; condition B received English followed by Spanish). In the Level 4 study, Thordardottir, Weismer, and Smith (1997) used a single-case, alternating treatment design to compare vocabulary learning in two treatment conditions (monolingual English versus bilingual Icelandic-English) for a bilingual child with language impairment.

Data from the three studies provided evidence and preliminary answers to Julia's general question about using both languages for intervention of language impairments in bilingual learners (Kohnert & Medina, in press):

1. Can bilingual children with language impairment learn two languages?

    Tentative yes; data from all three studies (Perozzi, 1985; Perozzi & Sanchez, 1992; Thordardottir, Weismer, & Smith, 1997) showed bilingual children with language impairment or delay increased their learning of vocabulary from baseline to post-measurement, in bilingual (using both L1 and L2) treatment protocols that taught novel vocabulary. Bilingual children with language impairment can and do learn in environments that include both L1 and L2.

2. Will changing the environment to only one language improve outcomes?

    Tentative no; data from these three studies showed bilingual children with language impairment/delay made vocabulary gains in bilingual treatment protocols that were at least as effective as mono-English protocols (Thordardottir, Weismer, & Smith, 1997) or superior

to mono-English models (Perozzi, 1985; Perozzi & Sanchez, 1992).

3. Will increasing skills in L1 hinder skills in L2?

    Tentative no; data from these three studies showed bilingual children with language impairment/delay learned new vocabulary words with fewer trials in bilingual treatment protocols that presented Spanish first, English second versus English first, Spanish second (Perozzi, 1985), fewer trials in Spanish first, English second versus mono-English (Perozzi & Sanchez, 1992), and the same number of new words in bilingual versus mono-English treatment (Thordardottir, Weismer, & Smith, 1997). In the first two studies, L1 helped L2, and in the third study, L1 neither helped *nor* hindered L2, but given it was equal, the authors promoted a bilingual environment because of the added social benefits (e.g., connection to one's family and community).

In response to Julia's more specific clinical question of how to increase comprehension of action vocabulary, the three studies did not provide a clear answer because no study used action words as the only stimuli choice. The stimuli included prepositions and pronouns in Perozzi (1985), were not specified in Perozzi and Sanchez (1992), and included nouns in Thordardottir, Weismer, and Smith (1997). Similarly, no study provided evidence for increasing utterance length using action vocabulary; two of the studies focused on receptive skills only (Perozzi, 1985; Perozzi & Sanchez, 1992), and the third included expressive skills, but used nouns as the stimuli (Thordardottir, Weismer, & Smith, 1997). Though the external evidence was not an exact fit with her own clinical case, Julia thought she could use portions of bilingual intervention protocols in the studies to develop an initial intervention plan. She could monitor this plan by collecting her own data in a manner similar to single-subject designs (Kohnert, 2007).

The bilingual intervention protocol in each study included a bilingual baseline data collection (to identify unknown words in the native language [L1] or second language [L2]), an intervention period (the experimental phase, which varied in the three studies between presenting the vocabulary learning in L2 only, simultaneous L1 and L2, sequential L1 followed by L2, or sequential L2 followed by L1), and a final data collection. Intervention strategies included modeling and reinforcement feedback

used in Perozzi (1985) and Perozzi and Sanchez (1992), and modeling, imitation, expansion of utterances, contingent responding, feedback, and positive attention towards the L1 used in Thordardottir, Weismer, and Smith (1997). The lengths and durations of intervention sessions were not reported in the Perozzi studies, but the lengths and durations in the third study were 50-minute sessions, twice per week, for 7 weeks. The vocabulary selected for intervention was based on individual baseline data (unknown words in L1 and L2). Though vocabulary might have been selected from a general category (e.g., prepositions, nouns) the exact vocabulary words varied from subject to subject in the Perozzi studies. Vocabulary was individually selected upon consultation with the client's family in Thordardottir, Weismer, and Smith (1997) study. All three studies reported positive gains. In the two studies with statistical analyses (Perozzi, 1985; Perozzi & Sanchez, 1992), statistical differences favored bilingual intervention in which L1 was presented first and L2 was presented second.

Julia determined that the procedures in all three studies were replicable, with the important exception of the native language component. Unlike the studies, Julia does not speak the native language of her student as the research examiners did with their participants. As an alternative, Julia will need to provide the native language intervention component in collaboration with bilingual communication partners (e.g., paraprofessionals, peers, siblings). Though this may require slightly more planning than English-only intervention, excluding the L1 component would likely negate the positive intervention results as shown in all three studies.

When external evidence is limited, as demonstrated in Julia's search, there may be an imbalance among the three pieces of evidence (external, internal-clinician, and internal-client). In these situations, SLPs must use their clinical knowledge and experience, and the client's needs and preferences as internal evidence.

Step 2: Evaluating Internal Clinician Evidence

Speech-language pathologists are often part of an agency (e.g., school, hospital, clinic) that possesses certain knowledge and expertise, as well as agency policies. In the assessment and intervention of communication disorders for diverse populations, clinical expertise and knowledge,

which may be based on local clinician data and continuing education, may be particularly important if there is limited external evidence. Like external scientific evidence, not all internal evidence is created equally. Gillam and Gillam (2006) list four levels of clinician internal evidence-related factors, Levels 2 to 5, similar to external evidence factors, Levels 1 to 5, that affect the clinical decision-making process. However, no clinician internal evidence is ranked as high as Level 1 external evidence (e.g., randomized clinical trials). Clinician internal evidence factors include clinician education, agency policies and financial resources, clinician data, theoretical orientation, and recommendations.

Julia did not do coursework in assessment and intervention for diverse learners in her graduate program 15 years ago, but she has participated in numerous professional opportunities related to ELLs, including conferences, district staff development, and small-group peer learning. Her average caseload has been 45 students, with most receiving a combination of direct and indirect services. For many disorders, she feels she has a good understanding of "what works" in intervention; however, she also understands that the current state of accountability in schools demands a combination of external evidence with clinical experience to suggest "what works."

In her first 10 years as an SLP, Julia estimates that she has worked with an average of 7 to 8 bilingual children with language disorders on her annual average caseload of approximately 45 students, primarily Spanish-English bilingual. In the past 5 years, this number has increased to at least 12 to 15 bilingual children each year, including Spanish-English and Somali-English speakers. During the last 15 years, Julia's school resources and daily clinician data have been adequate to plan and implement intervention. Prior to her present literature search, Julia's only evidence for making clinical decisions on intervention for bilingual learners included her experience working with children and continuing education programs, which included more expert opinion/guidelines than original data for language intervention.

Step 3: Evaluating Internal Client Evidence

The third component of the three-pronged EBP process includes internal-client evidence. ASHA considers EBP a client/family-centered practice, and that a "clinician's task is to interpret best current evidence from systematic

research in relation to an individual client, including that individual's preferences, environment, culture, and values regarding health and well-being" (2004). Gillam and Gillam (2006) suggest a hierarchy of five levels of internal-client evidence to consider in the EBP process: strong cultural values and beliefs (Level 1), student activities children find enjoyable and motivating (Level 2), financial resources of the family, if needed, to implement intervention (Level 3), family communication and involvement in the therapy process (Level 4), and family beliefs about a particular invention (Level 5). Strong cultural values and beliefs are rated as Level 1 internal evidence, which may compete with Level 1 external evidence (randomized clinical trials or a systemic review of RCTs). Considering the impact of the evidence, speech-language pathologists will want to gather information regarding a client's (and his/her family) preferences, environment, culture, and values in a sensitive, thoughtful process. This requires cross-cultural communication skills, particularly when the cultural values and beliefs from students and families may be different from those of the school community, or different from the SLP's personal and professional experiences (Kohnert, 2008).

The individual client factors for Abdi and his family may be very different from other students and families. While conversations with Abdi's mother did not suggest any strong cultural values and beliefs in direct opposition of the proposed special education services, she was unsure Abdi would make improvements, given his development was so different from his two older brothers and in Africa, children with special needs do not receive "extra" services, rather they tend to stay home with families. She noted his expressive language is particularly discrepant from his bilingual siblings as well as other bilingual children in the community, producing only a few words at a time for his age of six and not understanding either Somali or English well. Given such a severe delay, his mother worried whether progress was possible. After the interpreter translated this apprehension to the school team, they took greater care to explain to Abdi's mother

- the special education process in general,

- the diagnosis of language impairment specifically,

- how language impairment affects the observed communication difficulties (e.g., frustration, unable to communicate needs),

- the purpose and types of activities that may help

Abdi communicate more effectively, and

- the progress monitoring of his skills in both languages.

Abdi's mother asked whether both languages should be used with Abdi because he has learning difficulties (i.e., "Should he learn English only, now that he attends English school?"). This question led to a team discussion about the positive advantages of keeping two languages when one needs both languages to be successful in his/her environments and bilingual children with language difficulties can and do learn two languages (Perozzi, 1985; Perozzi & Sanchez, 1992; Thordardottir, et al., 1997). When asked about Abdi's school work at home, his mother reported Abdi is proud of his homework.

In addition to these family factors, Abdi has definite preferences for the types of activities he finds enjoyable and motivating. His mother and classroom teacher reported a short attention span for table top activities (such as structured tasks in reading, math, writing) of no longer than 10 minutes. He is highly motivated by physical play and activity as well as praise and tangible reinforcements for completing work. He may refuse to complete work when he perceives it cannot be accomplished, at both home and school, and appears to benefit greatly from visual cues when completing tasks (gestures, pictures, drawings).

Step 4: Integrating External and Internal Evidence

Julia developed an intervention plan by integrating the three pieces of evidence (external data, internal clinician, and internal client) to address her general goal of using both languages in the intervention of language impairments for bilingual learners, as well as her two specific goals of increasing comprehension of action vocabulary and increasing syntax related to action vocabulary. Because Julia does not speak Somali, the intervention plan requires a combination of collaborative services with individuals who speak Abdi's first language, including his family, bilingual peers, and Somali interpreters. When creating her intervention plan, Julia summarized details of each of the three studies, which are contained in Appendix A.

Julia will begin intervention by collaborating with Abdi's mother and teacher to select an initial set of 16 action words judged to be important at home (eight by

Abdi's mother) and at school (eight by Abdi's teacher). The number "16" was based on the methods sections from the three studies, which ranged from 8–16 words learned, although no rationale for this number was given in any of the studies, and after this initial intervention phase, Julia may select a higher/lower target number based on Abdi's individual data. These 16 words will be selected from a larger set of verbs that require a direct object (examples: break, sell, took, bought, write, like, see, give, bring, grow, kick, want, chase, read, pay, pick, tell, watch, show, call, find, make, drop, cut, draw, color). Julia has used these words successively to increase utterance length and complexity with mono-English students with language disorder, as the verb requires a direct object, which, by the nature of the task, promotes a longer utterance. To see if this same list of verbs was applicable to Somali language, Julia consulted with the school's Somali interpreter; meaning for many of the verbs existed in both English and Somali. Choosing the verbs from a larger set of direct object verbs (versus arbitrary selection of verbs) is an example of how Julia inserted her successful clinical experience and knowledge (internal evidence) into the current EBP process.

After the set of 16 words is chosen by Abdi's mother and teacher, Julia will collect baseline data for the eight words at home and the eight words for school. The baseline goal is to identify which of the 16 words is known receptively as single words ("Point to ___."), expressively as single words ("What is this?"), and expressively as phrases ("Tell me about ___."). This continuum of skills was based on a combination of the methods sections from all three studies (the three studies targeted single-word receptive or expressive vocabulary) as well as client needs (his assessment report, including parent input, placed a high priority on longer utterances for communication). To collect this baseline data, prompts were tested in English and Somali through the use of an interpreter to confirm the targets were unknown in both languages. For receptive baseline, each word will be presented with two to three foils in random positions, to ensure correct performance reflects actual knowledge and eliminate any position bias. This baseline procedure was based on the methods from the three studies Julia found in her literature review. For each of the words, intervention will begin at the next level (e.g., if known receptively, then expressive label is the goal), although this does not imply Julia must wait for mastery before

proceeding to the next level (e.g., she may choose to cycle between various skill levels).

Two intervention booklets of eight pictured words each will be created, one for home and one for school. For each page of the booklet, one of the eight words will be pictured along with a chart reflecting the continuum of skills (i.e., point, label, tell about). The chart will have boxes, to be checked off by Abdi and his communication partner, in order to monitor progress and give feedback. The expected duration of intervention sessions is 5–10 minutes, twice weekly, given information regarding Abdi's attention span and tolerance for frustration. Julia's primary intervention agents for Somali include Abdi's family at home and bilingual peers in the classroom. Methods from Thordardottir, et al. (1997) included a home component. Julia has also had success working with these two types of intervention agents in prior intervention programs for other students. Abdi's mother will be encouraged to follow Abdi's lead at home, discussing the pictures in which Abdi is most interested. Classroom peers may choose to complete activities in Somali only or Somali followed by English.

Julia will confer with Abdi's classroom teacher regarding the classroom schedule and opportunities for 5–10 minutes of the peer intervention. Abdi's teacher suggested a period everyday in which the children work in pairs for vocabulary and reading practice. One of the school's Somali support staff is present in the classroom during this time. The teacher recommended that a structured picture schedule of days/times/events was best for Abdi, so that he understands what is expected.

Julia will provide all intervention training in collaboration with the classroom paraprofessional and/or school interpreter. In general, Abdi's peers and family will be using general strategies for increasing language skills such as imitation, modeling, modeling plus feedback, contingent responding, and expansion of utterances—all strategies in which Julia uses with her mono-English students with language disorder. Intervention services in English will also target action words and expanded utterances; however, Julia's sessions will likely be longer, incorporating target words in curriculum-based books, play, and social language activities. To facilitate the generalization of treatment gains from Somali to English and English to Somali, the school and home books will be alternated. This will enable Abdi to observe (and produce) how the same action concepts (e.g., write) can be

expressed in different languages for different purposes. This is one type of activity to promote cross-linguistic transfer (Kohnert, 2008).

Step 5: Evaluating Clinical Decisions through Ongoing Monitoring

The final step in the EBP process includes ongoing monitoring of clinical decisions. Given the relative paucity of external evidence to guide clinical decisions for bilingual learners, the varying individual needs of students and families, and the potential cultural mismatch between students/families and the service providers developing intervention plans, ongoing monitoring in baseline, and pre-/post-data format is essential for intervention planning. For bilingual children with language impairments, gains may not be the same for both languages at any one point in time (Jia et al., 2006) and these gains may be more difficult to measure than traditional mono-English standardized scores. Similar to best practice procedures for assessment of diverse learners, best practice for intervention monitoring also includes pooled data.

Data for Abdi's two specific language intervention goals, increasing comprehension of action vocabulary and increasing syntax related to action vocabulary, will be collected by using the input from the classroom and Abdi's family, based on the check-off boxes present in the classroom and home vocabulary books, as well as formal data collection using the Somali interpreter for collecting baseline data. Additionally, Julia may want to monitor the functional outcomes of Abdi's intervention: *Is Abdi communicating more effectively at home, given training and the home-school action book as a medium for teaching imitation, modeling, and expansion of utterances? Is Abdi requiring less adult support in the classroom for communicating his needs?* While the discussion of functional outcomes is beyond the scope of Julia's clinical questions presented in this paper, Julia's clinical experience and knowledge suggests future data collection for functional outcomes such as classroom observation and teacher/support staff interviews, language samples, and parent interviews.

Conclusions

Julia used a 5-step EBP process to address clinical questions about intervention planning for bilingual students with language impairment through the example of Abdi. She gathered and evaluated scientific evidence from the literature base, and internal clinician and client evidence. Then, by integrating the sources of relevant evidence, she planned for treatment and an ongoing assessment of its success at supporting both home and school languages, Somali and English. At the end of this EBP process, Julia can have some confidence in using the data from the three external evidence studies (Perozzi, 1985; Perozzi & Sanchez, 1992; Thordardottir, et al., 1997) to answer her general clinical question, *What evidence is available to support the use of both languages for intervention of language impairments in bilingual learners?* Given only one Level 2 study, one Level 3, and one Level 4, the answer remains *preliminary*. Although preliminary, data from the three studies demonstrated bilingual children with language impairment can learn two languages in intervention, changing the environment to only one language does not improve intervention outcomes for these children, and increasing native language skills does not hinder English gains in intervention. Julia is a key advocate for including both Somali and English in Abdi's intervention planning.

However, less confidence is available for using the data to answer Julia's more specific clinical question, *What evidence is available for increasing comprehension of and expanded utterances related to action vocabulary for bilingual children with language impairments?* In this scenario, the external evidence only loosely matched Julia's clinical case because no study examined action words specifically. Based on the three studies, Julia can initiate an initial intervention plan using portions of the intervention protocols. Given this slight mismatch between external data and Julia's clinical case, Julia must be an alert clinical scientist, employing lessons from single-subject design to continually assess Abdi's progress and aggregating her data from local cases. While Julia awaits newly published data, her local data can be used not only for monitoring the outcomes of Abdi's intervention and changing the course of treatment if needed, but also for making EBP decisions for other students on her caseload.

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Table 1. Literature Search of ASHA Database

Key Words	Number of Citations	Number of Citations After Review	Citations
child bilingual language intervention	18	3	Perozzi 1985; Perozzi & Sanchez, 1992; Thordardottir, Weismer, & Smith, 1997
child ESL language intervention	1	0	
child ELL language intervention	3	0	
child minority language intervention	21	0	
child bilingual vocabulary learning	14	2	Perozzi 1985 (duplicate); Thordardottir, et al., 1997 (duplicate)
child second language learning vocabulary learning	19	0	
child bilingual language treatment	9	1	Thordardottir, et al., 1997 (duplicate)

Table 2. Literature Search of ERIC Database

Key Words	Number of Citations	Number of Citations After Review	Citations
bilingual language intervention	2	0	
bilingual language treatment disorder	3	0	
bilingual language intervention handicaps	14	2	Perozzi 1985; Perozzi & Sanchez, 1992
bilingual language treatment handicaps	4	0	
bilingual vocabulary learning intervention	16	0	

Appendix A: Summary of Studies, based on Law and Plunkett (2006)

Headings	Subheadings	Perozzi, 1985	Perozzi & Sanchez, 1992	Thordardottir, Weismer, & Smith, 1997
Title and Abstract		Summarizes within-in subject (ABBA) study design.	Summarizes study as group comparison with randomized assignment between two treatments.	Summarizes study, design is single subject, alternating treatments.
Introduction		The introduction provides the rational for the pilot study of receptive vocabulary learning for bilingual LI, based on five reviews in literature to date. No data in literature to date. Will examine sequence effects of L1 facilitation on L2 receptive vocabulary, for both Spanish then English and English then Spanish instruction, theory based Cummins (1981).	The introduction provides the rational to conduct this larger study based on the 1985 pilot. No addition to database on bilingual LI. Based on interdependence theory (Cummins, 1981) suggesting L2 learners use L1 for learning. Will examine L1 facilitation on L2 receptive vocabulary learning in bilingual language delay (defined by −1 SD).	The introduction provides the rational for the study, giving background on the negative consequences of eliminating L1 and the debate of how best to educate ELL children including immersion programs. Successful bilingual experiences likely depend on both social and linguistic factors. Will examine the effects of monolingual versus bilingual treatment conditions on expressive vocabulary; bilingual treatment will have positive attitude towards L1.
Methods	**Participants**	Three Spanish-Speaking (SS): one subject each with language delay, LI, and typical language. Ages 4:4–5:3. Three English-Speaking (ES): one subject each with language delay, and two with typical language. Ages 4:0–5:5. Language delay and LI for SS based on pooled data; TOLD scores used for ES.	38 bilingual SS 1st graders with language delay, randomly assigned to groups A or B. Nonsignificant t-test for between-group difference for language measure (average standard score of 77). All treatment was delivered individually. Group A received Spanish instruction before English, with Spanish receptive scores attained first. Group B received English only instruction.	One male, age 4:11. Sequential bilingual, slightly higher language skills in Icelandic (L1) than English (L2), has difficult time understanding longer utterances.
	Objectives	To explore facilitating effect of L1 on L2 for both SS and ES. Outcome measure based on number of trials to receptive mastery of 2–3 words for L1 and L2 in each of four conditions: ABBA (A = taught in L1 first, then L2) (B = taught in L2 first, then L1)	To explore the facilitating effect of L1 on L2 for SS first graders with language delay, as objectified by the number of trials to learn unknown words in L2 for two intervention conditions: Group A (bilingual) vs. Group B (English only).	To compare a single subject's learning of English (L2) vocabulary in monolingual English versus bilingual Icelandic/English conditions.

continued

Appendix A, continued

Headings	Subheadings	Perozzi, 1985	Perozzi & Sanchez, 1992	Thordardottir, Weismer, & Smith, 1997
	Baseline	Unknown targets tested in both languages	Unknown targets tested in both languages	Unknown targets tested in both languages
	Interventions	Provided by a bilingual and bicultural graduate student. Vocabulary stimuli included unknown noun pictures; 16 words for 5 y.o., 12 for 4 y.o.; pictures randomly separated into four sets with foils for each ABBA condition. 5 y.o. learned 12 new words; 4 y.o. 8 words.	Vocabulary stimuli were prepositions and pronouns in unknown pictures for English or Spanish per each participant. Group A did not receive English instruction until Spanish comprehension criteria attained (3 correct responses).	Vocabulary stimuli selected in cooperation with parent. For each condition (mono versus bilingual), 8 English and 8 Icelandic words (randomly divided to the two conditions). In both conditions, words presented in play, using objects and actions. Production of target words probed twice at end of each of fourteen 50-minute sessions, twice weekly for 7 weeks. Location at university.
		Frequency and length of treatment sessions not reported.	Frequency and length of treatment sessions not reported.	
		Location at university clinic.	Location at school. Average number of words learned was 9 words.	
		Interrater reliability greater than 97%.	No interrater reliability reported.	
	Sample Size	6	38	1
	Randomization	No	Yes for groups	Yes for stimuli and treatment
	Blinding	n/a	Unclear	n/a
	Statistical Methods	Non parametric Sign Test of significance	One-tailed t test	None, visual data only. At end of 14 weeks, production of words increased in both conditions. Slight advantage of bilingual condition (average 2 word difference above monolingual condition).
		1) Difference in trials to learn words for L2 in A vs. B conditions (x ≤ 1, p = .003). Trials to L2 were fewer when L1 presented before L2.	Mean number of trials to criterion (words learned) was 1.41 vs. 3.07 for group A vs. group B (t = 2.27, p <.05).	
			Means (but no statistics)	

continued

Appendix A, continued

Headings	Subheadings	Perozzi, 1985	Perozzi & Sanchez, 1992	Thordardottir, Weismer, & Smith, 1997
		2) Difference in trials to learn words in both L1 and L2 within a single set in A vs. B conditions. (x ≤ 2, $p = .033$). Trial to learn both languages were fewer when L1 presented before L2.	Total number of trials for group A to learn words was 348 (140 Spanish, 244 English) versus group B with 511 trials.	
	Participant Flow	All participants remained present throughout study	All participants remained present throughout study	Participant remained in study
	Recruitment	Head Start, Tucson AZ	Rural public school near El Paso, TX; 179 1st graders tested for language delay, 38 qualified for study ($-1\ SD$),	Participant came to university clinic for speech-language therapy; previous diagnosis of language impairment in Iceland
	Baseline Data	Yes, all words unknown before intervention, as tested by examiner.	Yes, all words unknown before intervention, as tested by examiner.	Yes, all words unknown in baseline period.
	Numbers Analyzed	6	38	1
	Outcomes	Number of trials to learn new words in L1 and L2.	Number of trials to learn new words in L2.	Production of English words.
	Ancillary Analyses	None	None	None
	Adverse Events	None	None	None
Discussion	**Interpretation**	Pilot study; caution.	Less caution, bigger study.	Single subject study; caution.
		1) All SS subjects, regardless of language skill, learned new L2 words faster when L1 preceded L2. 2 out of 3 ES learned new L2 words faster when L1 preceded L2. Both results suggest a bilingual approach to early learning.	1) Same protocol as 1985 pilot study (i.e., L1 instructional approach).	1) Eliminating one language has negative consequences for either L1 or L2. Optimally, if child is in bilingual environments, he/she needs both languages. In this study, combining languages in treatment did not slow down English growth as support for bilingual approach plus it has added advantage of positive social functionality.

Appendix A, continued

Headings	Subheadings	Perozzi, 1985	Perozzi & Sanchez, 1992	Thordardottir, Weismer, & Smith, 1997
		2) SS learned English L2 faster than ES learned Spanish L2, likely due to more English in SS environments than Spanish in ES environments.	2) Other factors may have influenced results, such as anxiety, motivation towards L2 and prestige of L1.	2) Bilingual children with language can and do learn both languages. If the SLP is not bilingual, implication is to use bilingual resources.
		3) Different rates of achievement among participants. The typical SS learned slower than SS with LI. Other child variables affect learning.		
	Generalizability	Clear protocol and participant description to replicate L1–L2 vocabulary program using bilingual staff, peers, siblings. L1 facilitates L2 learning. Bilingual children with LI can and do learn in both languages.	Caution to replicate due to less clear participant diagnoses, but easily implementable L1–L2 vocabulary program using bilingual staff, peers, siblings. L1 facilitates L2 learning. Bilingual children with LI can and do learn in both languages.	Tentative, subject served as his own control, poor external validity. Treatment protocol employs naturalistic expressive use of words in play, discussion and expanded utterances
	Overall Evidence	Pilot study, will continue research with more participants.	Caution needed due to weak criteria for documenting language delay and dominance; discrete-point versus pooled data is debatable in narrative reviews Doesn't mention future research.	Single-subject design limitations. Discussion related to research questions without mention of future research.

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