

Comparative Effects of Spanish and English Vocabulary Instruction for English Language Learners with Moderate Intellectual Disability

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ABSTRACT

Schools across the country are inadequately prepared to meet the educational needs of English language learners (ELLs), much less the needs of ELLs who also have an intellectual disability (ID). In this exploratory study, three Mexican American elementary students with moderate ID were given vocabulary word instruction in English and Spanish using an alternating treatments design, and the effects of the number of words correctly identified per instructional strategy were measured. Two of the students acquired a greater number of English vocabulary words in the Spanish model-lead test intervention. Vocabulary scores increased for the third student under both conditions, but there was no differential advantage by language. Implications for future research and practice related to instructional strategies for this population are discussed.

The Office of English Language Acquisition, Language Enhancement, and Academic Achievement for Limited English Proficient Students (OELA; 2008) identified over 5 million English language learners (ELLs) in the United States in 2005-2006. Of these, almost 80% were Spanish-speaking. According to the U.S. Government Accountability Office (GAO, 2009), the overall school population grew 3% between 1999 and 2006, while the number of ELLs increased 60% in the same time frame. By 2030, ELLs will comprise 40% of the total school population in elementary and secondary school settings (Flynn & Hill, 2005). ELLs are more likely to drop out of school than other student groups, and the general population of ELLs consistently scores lower on statewide accountability

assessments. (McCardle, Mele-McCarthy, Cutting, Leos, & D'Emilio, 2005; Thompson, 2004). Low academic achievement is one of the primary reasons for referring students to special education (McCardle, et al., 2005).

The Individuals with Disabilities Education Act (IDEA) Data Accountability Center (DAC) conducted a student count in 2010. According to the data there were a total of 51,667 ELLs, ages 3 to 21, with disabilities being served under IDEA, Part B (IDEA DAC, 2010). However, the DAC does not provide specific information on the number of ELLs with mild, moderate, or severe ID, nor does it provide other student background characteristics (e.g., age, gender, type of ID, and number being served in self-contained classrooms). Although

researchers have focused their attention on ELLs with learning disabilities, there have been relatively few studies of ELLs with ID (e.g., Durán & Heiry, 1986; Rohena, Jitendra, & Browder, 2002), and statistics specific to the latter group are hard to obtain. Consequently, how to appropriately serve ELLs with ID remains an enigma for special education professionals. Mueller, Singer, and Carranza (2006) surveyed 337 special educators across the United States to obtain information about current practices and resources available to special education teachers of ELLs with severe ID. Over half of the teachers surveyed had no prior experience with ELLs with ID, and only 8% were fluent in a second language. Fewer than 50% of the respondents indicated that they had access to instructional materials in a language other than English. This is a critical issue for the field because interventions provided to ELLs with ID must simultaneously address students' disability- and language-related needs.

ENGLISH VOCABULARY DEVELOPMENT

By definition, because they are in the process of acquiring the language, ELLs will have difficulty acquiring vocabulary and literacy skills in English (August, Carlo, Dressler, & Snow, 2005; Cartledge & Kourea, 2008; Hickman, Pollard-Durodola, & Vaughn, 2004). Research suggests that the gap between the vocabulary development of ELLs and that of peers who speak English only contributes to academic difficulties experienced by ELLs (August et al., 2005). Expressive and receptive vocabulary acquisition, both in oral and print form, is a critical component of literacy development (August & Shanahan, 2006; National Early Literacy Panel, 2009, National Reading Panel, 2000). Students with larger vocabularies are more likely to have better comprehension skills (Lervag & Aukrust, 2010; Taboada, 2009). Furthermore, students with poor receptive and expressive vocabulary are more likely to experience difficulty with reading (Adams, 1990; Menyuk & Chesnick, 1997). Lindsey, Manis, and Bailey (2003) found that expressive (i.e., oral) vocabulary training improved the rapid object naming skills and print awareness of 249 Spanish-speaking ELLs. Furthermore, Uccelli and

Páez (2007) found a positive correlation ($r = .55$) between narrative ability and vocabulary knowledge for 24 bilingual students in kindergarten, suggesting that expressive vocabulary training may be a critical component of literacy development for ELLs. Providing supplemental oral vocabulary instruction may be a way to increase functional and academic literacy skills for ELLs and, more specifically, ELLs with ID.

VOCABULARY AND SIGHT WORD INSTRUCTION

Vocabulary development, with a primary focus on sight word instruction, has been the most studied literacy component for students with moderate to severe ID (Browder & Xin, 1998); however, this research has not included ELLs. Rohena et al. (2002) may have conducted the first experimental study that examined a way to teach vocabulary to this specific group of students. She and her colleagues used a single subject, multiple probe with a parallel treatments design to compare the effects of a Spanish and English constant time delay intervention to teach English sight vocabulary words (e.g., words used in grocery and department stores). Participants included four Puerto Rican middle school students with moderate ID, all of who had lived in the United States for a minimum of four years. Results indicated that three of the students made positive gains in sight word acquisition in both languages while one student made greater gains in the Spanish constant time delay intervention. The authors concluded that language of instruction might not be an important factor in learning to read English sight words. However, the results were difficult to interpret because of significant differences in participant characteristics. For example, language proficiency characteristics were described only generally as was the language of current and prior instruction. Two of the students had received bilingual instruction, one had not, and information about language of instruction was missing for the fourth. Moreover, one participant was re-classified as having a mild, not moderate, ID, which raises issues about the accuracy of student classifications.

More recently, Spooner, Rivera, Browder, Baker, and Salas (2009) taught an array of emergent literacy skills to an ELL with a moderate ID. The participant was a 6-year-old Mexican female in kindergarten. A multiple probe design across skill sets with forward chaining was used. The purpose of the study was to determine the number of items the student could answer correctly on a story-based lesson task analysis (i.e., a systematic list of steps needed to complete the lesson) using culturally contextual literature. Such literature incorporates a student's culture (e.g., language, heritage) as well as the "funds of knowledge" (Moll, Amanti, Neff, & Gonzalez, 1992), the prior knowledge and skills students have acquired in their homes and communities. The student was taught three skill sets. Skill set one included pointing to the title, author's name, orientating and opening the book. Skill set two required that the student answer a predictive question, turn a page to keep the story going, verbally identify new vocabulary in the story, and repeat a story line independently. Finally, skill set three involved text pointing, reviewing the prediction question to determine if the original answer was correct, and answering a comprehension question related to the story with the use of a new vocabulary word. Once the student had met the criteria for skill set one, skill set two was introduced. During this phase, skill set one was taught in conjunction with skill set two. In skill set three, the student was taught all steps/skills from the story-based lesson task analysis (e.g., opening a book, closing a book, identifying the title, learning vocabulary words, answering comprehension questions). Results showed that the student's overall emergent literacy skills increased. However, a combination of languages was used in the intervention. For example, skill set one was taught using Spanish instruction/literature. Skill set two was taught using concurrent translation and bilingual literature (i.e., Spanish and English), which involved reading a phrase or asking a question in Spanish and then immediately translating it into English. Finally, skill set three was taught using English instruction and literature. Baseline conditions in the study were conducted in English, creating a possible confounding effect in the data due to the transition of languages used as the intervention progressed.

Although primary language instruction has been found effective for typically developing ELLs (August & Hakuta, 1997; Greene, 1997; Slavin & Cheung, 2005), there is a paucity of research addressing effective linguistic and instructional practices for students with ID. As indicated previously, Rohena et al. (2002) argue that the language of instruction may not be an influential factor in the acquisition of sight vocabulary words by ELLs with ID whereas Spooner et al. (2009) suggest that incorporating and infusing primary language may be an integral component of literacy development.

Rohena et al. (2002) and Spooner et al. (2009) used systematic instruction (i.e., constant time delay, task analytic instruction) in their interventions. Systematic instruction is a highly organized, structured, and consistent form of instruction designed to utilize error manipulation, response prompting, and stimulus modification strategies to teach chained or discrete responses (Collins, 2007; Snell, 1983; Spooner, Knight, Browder, Jimenez, & DiBiase, 2011; Stokes & Baer, 1977; Wolery, Bailey, & Sugai, 1988). Similarly, explicit instruction—a systematic and direct approach to the design and delivery of instruction (Bursuck & Damer, 2011; Hall, 2009)—has been used successfully with ELLs (e.g., Pollard-Durodola & Simmons, 2009; Vaughn et al., 2006, 2009). Despite these positive findings, more research is needed on systematic and explicit instructional strategies to teach ELLs with ID.

In our review of literature published between 1980 and 2009, we found three research studies involving ELLs with ID (i.e., Durán & Heiry, 1986; Rohena et al., 2002; Spooner et al., 2009). Given this scant research base, there are many questions about this population that need to be investigated, especially in the area of literacy and language of instruction. We know very little about the effects of language, appropriate forms of pedagogy, literacy instruction, and/or how technology can be incorporated in daily lessons. Therefore, the purpose of the present study was to compare the effectiveness of two linguistic instructional procedures that incorporated systematic, explicit instruction and technology, within a model-lead-test approach (i.e., "I do, we do, you do;" Bursuck & Damer, 2011; Watkins & Slocum, 2004). The goal was to increase the English oral vocabulary of three Hispanic ELLs with

moderate ID. The study addressed the following research questions:

1. What are the comparative effects of a Spanish and English model-lead-test intervention on oral expressive (i.e., picture) vocabulary acquisition for ELLs with a moderate ID?
2. Which language of instruction will lead to faster acquisition of English vocabulary?
3. To what extent will students be able to generalize picture vocabulary words that they have learned?
4. What are teachers' opinions concerning appropriate linguistic instructional approaches?

METHOD

PARTICIPANTS

The participants were three Mexican American students, Isabella, Manny, and David (pseudonyms), who had been identified as ELLs by an urban elementary school in the southeastern United States. They had also been identified as having moderate ID and were served in special education self-contained classrooms. Students had been assessed using a variety of standardized tests (e.g., *Wechsler Intelligence Scale for Children-Third Edition*, WISC-III; Wechsler, 1991; *Batería III Woodcock-Muñoz*; Muñoz -Sandoval, Woodcock, McGrew, & Mather, 2005; *Vineland Adaptive Behavior Scale*; Sparrow, Balla, & Cicchetti, 1984). According to school records, Isabella and David had been tested in English, and Manny had been tested in Spanish.

Although the students were classified as ELL by their school district, the researchers chose to obtain additional information about the students' primary language from classroom teachers and parents, through informal assessments and classroom observations. For example, the primary researcher, who is of Puerto Rican descent and who speaks Spanish and English, informally interviewed the participants in Spanish and English. These informal interviews included a series of conversations and questions in both Spanish and English. For

example, students were asked to reply in either Spanish or English to a variety of questions about their day, and their likes and dislikes; and they were asked to identify various classroom objects/items. Based on these informal interviews, the researchers concluded that students had comparable skills in both languages, a criterion for participation in the study. The researchers also determined that they would be able to understand the students' speech and language as they performed required tasks.

Students. Isabella, a 10-year-old fifth grader born in Mexico, began third grade in the United States. Her parents had immigrated to the United States in 2006. Spanish was the primary language spoken at home. According to school records, Isabella had an IQ of 47 as measured by the WISC-III (Wechsler, 1991). She was served in a self-contained special education classroom where instruction was provided in English. Isabella primarily spoke English in class, but would use Spanish when she was unable to express herself in English.

David was a nine-year-old third grader with Down syndrome. His parents immigrated to the United States from Mexico before he was born. The primary language spoken at home was Spanish, and David often used a combination of Spanish and English when speaking. He obtained a score of 47 on the *Universal Non-Verbal Intelligence Test* (UNIT; Bracken & McCallum, 1998).

Manny was an eight-year-old second grader born in the United States. His family moved to Mexico shortly after his birth and then returned to the United States in 2007 when Manny began kindergarten. Like the other participants, he was identified as an ELL with a moderate ID (i.e., IQ score of 41 according to the *Batería III Woodcock-Muñoz*; Muñoz -Sandoval et al., 2005). Spanish was the primary language spoken at home, and Manny understood and spoke Spanish and English.

Interventionist. The interventionist (first author) had three years experience teaching in a high school self-contained setting with students with moderate and severe ID. He is of Puerto Rican descent, and bilingual in Spanish and English.

SETTINGS

All three students were served in a special education classroom where instruction was provided in English. However, David's teacher spoke some Spanish and provided simple directions (e.g., line up, raise your hand, get your pencil) in Spanish. Routines were similar across the students' classrooms. Each student received 90 minutes of literacy instruction as mandated by the school district: Isabella's teacher used the *Reading Mastery* program (Engelmann & Bruner, 1995), whereas David and Manny were provided literacy instruction using the *Early Literacy Skills Builder* (Browder, Gibbs, Ahlgrim-Delzell, Courtade, & Lee, 2007). In addition, students participated in general education, non-academic courses (e.g., music, art, physical education) with their typically developing peers. Instructional sessions were conducted in the students' special education classroom, three days a week for approximately 12 minutes per session, and lasted for 10 weeks. The amount of time involved in instruction varied across students. For example, Isabella and Manny were attentive and cooperative during instruction. David, on the other hand, was initially uncooperative (e.g., refusing to answer questions), possibly because he was unfamiliar with the researcher. These problems subsided over the course of the intervention, and David participated with no further difficulties.

MATERIALS

Microsoft® PowerPoint™ (2008) was used to create the instructional slides used in the intervention (e.g., Almond, 2009; Wood, Mackiewicz, Van Norman, & Cooke, 2007). Ten sets of slides were used for the Spanish and English (i.e., 50 English vocabulary words per intervention) model-lead-test sessions. Each set comprised an introductory slide, a review slide of five pictures (pictures learned in the previous session), five Spanish preview slides, five model-lead-test slides, and a "checkout" slide with the five picture vocabulary words in random order. At the bottom of each model-lead-test slide was a picture of three smiley faces. The first yellow smiley face represented the model slide (i.e., instructor says, "My turn"), a second yellow and grey

smiley face (i.e., instructor says, "Say the word with me") was used as the lead slide, and the final test slide presented a grey smiley face (i.e., instructor says, "Your turn").

After the review slide, the remainder of the instructional slides displayed the picture vocabulary in the center of the slide with the vocabulary word written in 20-pt Calibri font above the picture as shown in Figure 1. The word was written at the top of the picture vocabulary in small font naming the picture to eliminate any confusion as to the correct name of the picture vocabulary being taught by the researcher and a second observer. The final slide was the checkout slide. All five pictures on this slide were placed in random order and presented to the student. The interventionist asked, "What is this?" or "¿Qué es esto?", depending on the intervention. Students were then instructed to provide correct answers in English. All target vocabulary in both Spanish and English model-lead-test interventions was taught in English. Both sets of slides followed the same presentation format; the only difference between interventions was the language used to teach the vocabulary. The interventionist used a laptop computer to present the PowerPoint™ slides (see Figure 1) in one-to-one intervention sessions with each student.

RESEARCH DESIGN

A single subject alternating treatments design (Cooper, Heron, & Heward, 2007; Gast, 2010) was

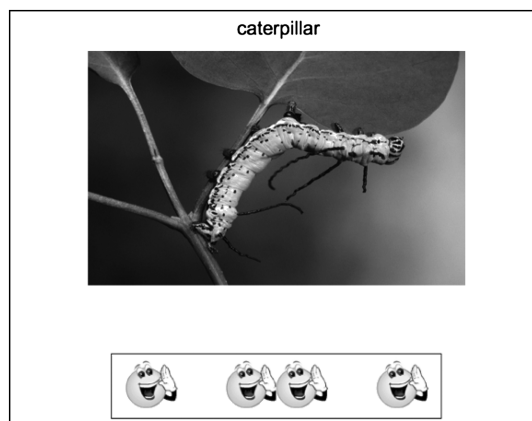


Figure 1
Example of an instructional slide in PowerPoint™.

used to analyze the comparative effects of a Spanish vs. English model-lead-test intervention to teach English vocabulary to ELLs. This design allows for fast alternation between two treatment conditions across a group of participants using random assignment. It also helps to examine the differential effects between the two treatments and is ideal when treatment conditions can be changed quickly, can be easily discriminated by the participants, and the effect of a treatment condition can be observed quickly (Cooper et al., 2007; Gast, 2010).

Prior to instruction, treatment conditions were randomized using a predetermined format for each participant across all 10 sessions. To determine the presentation order of the model-lead-test interventions, the interventionist flipped a coin. The Spanish intervention was assigned to heads and the English intervention was assigned to tails. Intervention sessions were alternated; a condition could not be presented three times in a row. For example, if a coin was flipped twice and the Spanish intervention (e.g., A) was selected both times the English intervention (e.g., B) would automatically be selected the third time (e.g., AB, BA, AB, AA, BA, BB, AB). Each treatment condition was presented three times to all students before a probe was administered. All instruction took place in a tutoring room near the students' classrooms.

DEPENDENT VARIABLES AND DATA COLLECTION PROCEDURES

The primary dependent variable was the number of English oral vocabulary words identified correctly by each student per instructional intervention (i.e., Spanish and English model-lead-test). Students were taught a total of 100 English picture nouns, 50 nouns in each treatment condition. The second dependent variable was the number of correct English oral vocabulary words students were able to identify in a generalization probe. At the end of the intervention cycle, the interventionist created a new vocabulary pool that included words students had correctly identified during probe but represented by pictures other than those used in the interventions. The new pictures were then shown to students as a generalization measure.

During probe sessions, students were presented with 100 picture nouns through PowerPoint™ slides (i.e., vocabulary from Spanish and English conditions), in random order. During the probe, students were asked, "What is this?" and "¿Qué es esto?" to ensure they understood the task. Students were then given four seconds to provide an oral response. Students were given credit for their responses only if they provided the correct English vocabulary word within four seconds. Responses provided in Spanish were scored as incorrect because of the study's focus on the number of English vocabulary words acquired as a result of the intervention. If students could not verbally identify the word within the allotted time, the interventionist proceeded to the next picture noun. Generalization data were collected in a similar fashion.

PROCEDURES

Vocabulary selection. A word bank consisting of 200 picture nouns was created for a pre-assessment measure. One hundred nouns were selected from the *Español to English* curriculum (Engelmann & Osborn, 2001), and the researchers created an additional bank of 100 picture nouns based on teacher input, which included objects that students encountered in home and school environments (e.g., pen, paper, desk, pan, stove, book).

The rationale for designing an intervention to teach oral vocabulary words in the form of pictures was twofold. First, oral vocabulary development may be a potential benefit for future pre-reading success (Adams, 1990; Menyuk & Chesnick, 1997; Wise, Sevcik, Morris, Lovett, & Wolf, 2007). Secondly, identifying and naming picture/objects serves a functional purpose, potentially contributing to the language development of students with ID (Mackay, Soraci, Carlin, Dennis, & Strawbridge, 2002; Worrall & Singh, 1983).

Pre-assessment. Once the word bank was complete, students were given a pre-assessment to determine vocabulary words they could not identify correctly. Vocabulary words were presented using PowerPoint™ slides. Students were shown a picture representing the target vocabulary and were then asked in Spanish and in English, "What is

this? *¿Qué es esto?*” Words that students were able to say correctly in English or Spanish were discarded. A pool of vocabulary the students had not been able to identify correctly in either language was then created. From this pool, 50 picture nouns were randomly chosen for each instructional condition and further divided into 10 sets of five picture nouns for each session within the conditions.

Spanish preview. To compensate for their limited English proficiency, at the beginning of each instructional session, students were presented slides introducing new vocabulary in Spanish, before the English or Spanish model-lead-test conditions were presented. This was to ensure that students could identify target vocabulary and make connections to new words learned (e.g., lluvia/rain). During this phase (i.e., after the first week), students also reviewed words learned from the previous week before proceeding to the Spanish review slides. During the Spanish preview, the primary interventionist pointed to a picture and named the picture in Spanish. The student then repeated the name of the picture. After all words had been identified in Spanish, the interventionist would say to the student, “Hoy vamos a aprender los nombres de estas fotos [imagenes] en inglés” (“Today we are going to learn the names of these pictures in English”).

English model-lead-test. After the Spanish preview slides, instruction using the English model-lead-test process began. The interventionist said, “Now we are going to learn our new words in English. First I will say the word, then you will say it with me, and then you will say it by yourself.” Five-picture vocabulary words in PowerPoint™ slides were presented, one at a time. The interventionist followed the model-lead-test procedure for all five words. Once complete, the interventionist said to the student, “Now, it’s your turn to say the words by yourself.” At this stage, the same five picture vocabulary words were presented to students, one at a time, and the interventionist asked, “What is this?” Students were given four seconds to correctly identify the word. If students were unable to provide the correct name for the picture within the allotted time period, the interventionist immediately provided the correct answer and

moved on to the next slide. At the end of the independent response slides, a “checkout” slide was presented. All five-picture vocabulary words were presented on the same slide, in random order, and students were asked once more to identify the words they knew.

After three instructional sessions, a probe was administered. During probes, students were given a test with all 100-vocabulary words from both conditions. Responses were only counted correct if students were able to say the correct English word within four seconds. After the probe, a new set of five vocabulary words was presented and the same procedures were followed for the remaining sessions. A mastery criterion was not set for each set of words because the purpose of the study was to analyze the comparative effects of language of instruction leading to greater acquisition of English vocabulary.

Spanish model-lead-test. During this condition, instruction and presentation of materials were identical to the English model-lead-test condition. The only difference between conditions was the linguistic presentation of instruction (i.e., Spanish vs. English). All target vocabulary was in English for both conditions. During probe sessions, students were asked in English and in Spanish, “What is this?” (i.e., *¿Qué es esto?*) in the interest of consistency and to ensure that students understood the question to which they were being asked to respond.

Generalization. A generalization probe was provided at the end of the intervention cycle using words that students correctly identified during the regular probe sessions. Pictures different from those used during the intervention were administered in the same format as probe sessions.

PROCEDURAL FIDELITY AND INTER-OBSERVER RELIABILITY

Procedural fidelity data were collected on 30% of instructional and probe sessions across students using a checklist developed specifically for the intervention. A second bilingual observer recorded the occurrence or non-occurrence of each step on the

fidelity checklist. To calculate procedural fidelity, the number of steps correctly presented was divided by the total number of possible steps and multiplied by 100. The mean procedural fidelity score across instructional sessions for the Spanish condition was 98% and 100% for the English condition. The mean procedural fidelity score throughout probe sessions for both instructional conditions was 100%.

To establish inter-observer reliability a second bilingual observer collected data on 30% of the vocabulary probes administered to each student per instructional condition. Scores were compared item-by-item (Cooper et al., 2007). Words from each condition were scored as correct or incorrect. The percentage of agreement was calculated by dividing the total number of agreements by the number of agreements plus disagreements and multiplying by 100. For Isabella and Manny, the mean percentage of inter-observer reliability was 100% for Spanish and English probes. The mean inter-observer reliability score for David was 100% for Spanish and 91% for English probes.

SOCIAL VALIDITY

A brief questionnaire was provided to each student's teacher to determine the social validity of the dependent measure (Cooper et al., 2007; Wolf, 1978). Additionally, the questionnaire sought to determine the teachers' perceptions on the effectiveness and practicality of the intervention. The questionnaire consisted of four questions (i.e., closed items) using a 5-point Likert-scale rating (see Appendix A). According to Cooper et al. (2007), the purpose for assessing the social validity of an intervention is to determine "...how satisfied they (e.g., parents, teachers, students) are with the relevance and importance of the goals of the program, acceptability of the procedures, and the value of the behavior change outcomes achieved" (p. 238). Prior to and at the end of the study, before the social validity questionnaire was administered to teachers, the purpose of the study, the interventions used, and results were explained to the teachers. They were then asked to complete the questionnaire based on their own personal beliefs and results of the study.

RESULTS

Figure 2 shows number of words correct for each student, in English, on vocabulary probes. After the first probe, the data paths for Isabella showed clear differences in favor of the Spanish over English model-lead-test instruction. Her highest score was 43 during Spanish instruction and 32 during English instruction. David's rate of vocabulary acquisition was higher for the Spanish model-lead-test instruction, with a score of 19 for Spanish and 6 for English instruction. A visual analysis of the graphs in Figure 2 further indicates that there was a steeper slope for the Spanish model-lead-test intervention for both Isabella and David, providing

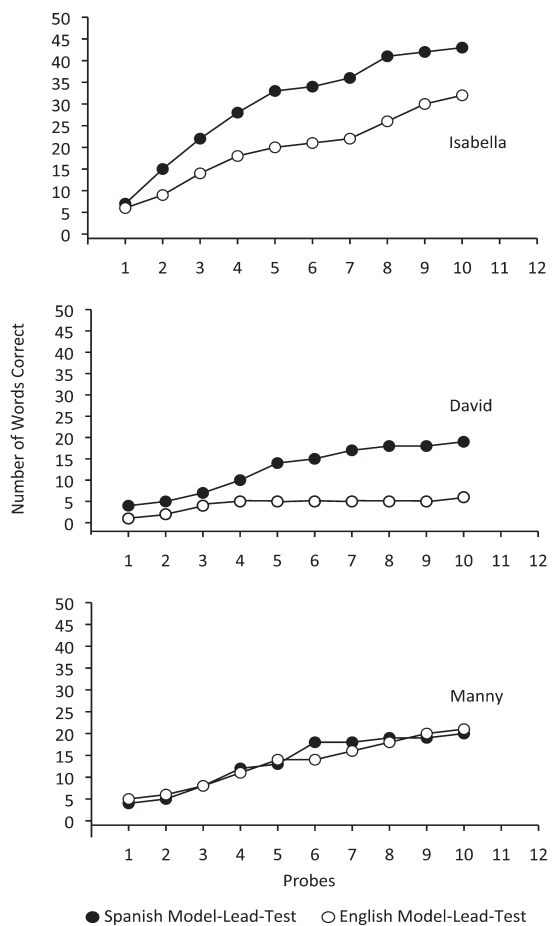


Figure 2
Number of words correct in English on vocabulary probes for Isabella, David, and Manny.

evidence that the intervention allowed for faster acquisition of English vocabulary. Manny's data showed an increasing trend in vocabulary acquisition, but did not favor either language. The slope for Manny's data suggests that both the Spanish and the English model-lead-test interventions allowed for similar rates of English vocabulary acquisition, with scores of 20 and 21 respectively.

GENERALIZATION

All students were able to generalize more English vocabulary used in the Spanish model-lead-test instruction compared to the English intervention. Isabella scored 10 in Spanish and 8 in English; David scored 4 in Spanish and 3 in English; and Manny scored 7 in Spanish and 4 in English.

SOCIAL VALIDITY

Overall, teachers indicated that their students benefited from the model-lead-test interventions and that the instructional intervention was practical. They felt that the intervention could have a positive impact in other content areas. Teachers believed that ELLs with moderate to severe ID should be provided support in their native language until they are familiar with English content.

DISCUSSION

The purpose of this study was to compare the effectiveness of using systematic and explicit instruction, within a model-lead-test approach, on English vocabulary acquisition for Hispanic ELLs with moderate ID. The results of the investigation raise several interesting points. In the Rohena et al. (2002) study, only one of four students improved performance when instruction in Spanish was used. Results for the remaining three students showed no differences between English and Spanish conditions. Conversely, two of the three students in the current study had higher rates of vocabulary acquisition when instruction in Spanish was used. The third student's performance showed no difference between instructional conditions. Unlike the positive generalization outcomes in the Rohena et al. (2002) study, generalization scores for all students

in the current study were lower than expected. It is important to note that both studies vary in the type of instruction provided (model-lead-test vs. constant time delay), and that students made gains in vocabulary acquisition regardless of the instructional approach; however, results for language of instruction are mixed. That is, the extent to which the language of instruction for this population supersedes effective instruction is unclear. Research for typically developing ELLs stresses the importance of primary language support when teaching literacy and language skills to this population of students (Slavin & Cheung, 2005); however, little is known about the effects of language of instruction for ELLs with ID (Mueller et al., 2006; Rohena et al., 2002).

The results of this study clearly indicated the success of one language over the other for two students. A visual analysis of the graphs shows a steeper data slope for Isabella, indicating a faster rate of acquisition compared to David and Manny. She acquired more words, at a faster rate, but is older and has had more schooling and educational experiences. During the study, she was more responsive to instruction than David and Manny, which may also have contributed to better results on probes, not only during the intervention but also in the generalization phase. Like Isabella, David demonstrated a steady and progressive change in slope and separation in data paths, indicating that the Spanish intervention was superior to the English. These results are difficult to interpret without specific information about their English and Spanish proficiency, but suggest that Isabel and David may have greater proficiency in Spanish than in English. In Manny's case, there were no differences in results by language of instruction. He may have had comparable proficiency levels in English and in Spanish.

Results for all three students might well be explained by the use of instructional strategies known to be effective for ELLs (Plass, Chun, Mayer, & Leutner, 1998; Echevarria, Vogt, & Short, 2007). For example, prior to both the English and the Spanish interventions, students received a Spanish preview to assure they could identify the target vocabulary and to make connections to vocabulary equivalents in English, even though both interventions required that students respond in English.

In the probe following the Spanish intervention, instructions were provided in both languages, again increasing the likelihood that the student understood the task. In addition, the interventions incorporated strategies frequently recommended for ESL instruction. Pictures were used to represent the concepts being taught, and content taught in previous sessions was reviewed as part of each intervention. The combination of these strategies may explain Manny's similar performance in English under both intervention conditions and his higher performance in Spanish on the generalization task.

Differences in the results of this study compared to those of Rohena et al. (2002) raise two interesting questions. How is language proficiency established for ELLs with ID in the United States? How valid are IQ tests for ELLs with moderate ID? Although informal observations, interviews, and family input helped researchers describe students' language skills, the investigators did not administer standardized measures of language proficiency or IQ. Formal measures of language proficiency, with emphasis on both receptive and expressive skills (e.g., *Test de vocabulario en imágenes Peabody*, Dunn, Padilla, Lugo, & Dunn, 1986; *Peabody Picture Vocabulary Test*, Dunn & Dunn, 1981) for this specific population are needed to help better understand the results of this study and others like it in the near future. However, while using formal measures of language assessment is recognized as a way to determine language proficiency, literature is insufficient in relation their uses for ELLs with ID. Similar issues can be raised about the use of IQ measures. Three different cognitive scales were used to classify students; although all were identified as having moderate ID, differences in student performance on the intervention and generalization tasks raise questions about the classifications. The question of how best to assess students who are culturally and linguistically diverse, and who may also have a moderate or severe ID, warrants continued study.

Future inquiries should gather extensive background information about participants. In addition to language proficiency, the nature and type of native language and/or ESL instruction should be established; prior performance across grades and across languages, if appropriate, should be

documented. These data are often missing or incomplete for English language learners (Wilkinson, Ortiz, Robertson, & Kushner, 2006). Research on assessment of students' current academic and functional skill level and interpretation of results with consideration of their linguistic abilities is a critical need in the general and special education fields. Researchers should incorporate formal language assessment measures to gather as much information as possible about the students' current language and performance levels.

LIMITATIONS AND IMPLICATIONS FOR FUTURE RESEARCH

Results of this investigation must be interpreted with caution as the study has limitations that should be addressed in future research. First, maintenance data on students' performance were not collected, and the assessment of generalization was conducted only as a posttest. Therefore, the extent to which students may have been able to respond correctly to generalization items prior to instruction is unknown. Future research should include measures of maintenance and measures of generalization throughout the study. Second, students showed minimal gains on the generalization probe. This may be the result of providing only one instructional example (i.e., a picture) of each vocabulary word during instruction, thus making it difficult for students to generalize their vocabulary to a new example. Future studies should include multiple examples (e.g., several pictures of different umbrellas for the target word "umbrella") to promote generalization (Engelmann & Carnine, 1991). Third, Isabella's teacher was not aware of the list of vocabulary words used in the study. Consequently, she taught a lesson on food groups and included some words (e.g., carrot, apple) that were also used in the study. This additional instruction may have influenced Isabella's results. Future investigations on vocabulary may avoid potential confounds by ensuring that vocabulary words selected for a study are separate from words directly taught during classroom instruction. Fourth, only three students participated in the study; therefore, the results should be interpreted with caution.

As mentioned earlier, a staple of special education single subject methodology is a limited number of participants. The special education population makes up only a small fraction of the total school population. Currently, there does not seem to be any information that provides an accurate number of students classified as being English language learners with ID. Additionally, it is not known if these learners are, in fact, typically given two classifications as was done by the public school system in this study or are given one classification/placement over the other. Furthermore, the vocabulary words in this study were taught under controlled conditions. For example, students were provided one-on-one instruction in a quiet tutoring room without distractions. Generalization occurred in the same condition. Future research should consider measuring whether or not students can use and generalize vocabulary within multiple settings (e.g., 3-D objects; Wood et al., 2007). Additionally, replication of this study with similar participants or participants with more similar attributes (e.g., same grade levels, similar IQ scores, age, language skills) will provide a clearer depiction of how language proficiency/dominance for ELLS with moderate ID truly affects second language acquisition.

IMPLICATIONS FOR PRACTICE

This study offers practical implications for teachers. First, teachers or assistants can use PowerPoint™ to set up and provide supplemental vocabulary instruction in the classroom (e.g., Wood et al., 2007). This supplemental instruction is not time consuming (e.g., 10 to 15 minutes) and allows teachers who are not fluent in Spanish to provide students some native language support. Only basic instructional language in Spanish (e.g., “What is this? ¿Qué es esto?”) is necessary. Of course, understanding students’ comments and responses in Spanish that are not part of the script requires proficiency in Spanish. Second, students are often motivated by instruction that utilizes technology. In addition to instruction with a laptop computer, such as the instruction in the current study, teachers could present similar vocabulary lessons using interactive whiteboard technology (e.g., Campbell

& Mechling, 2009; Mechling, Gast, & Thompson, 2008) to promote student engagement. Finally, results of the study suggest that incorporating primary language support in conjunction with effective instruction can increase vocabulary skills for ELLS with ID. Teachers need be cognizant of their students’ needs and know that instruction for these students will require culturally responsive techniques (i.e., incorporation of primary language) that should be factored into daily instructional routines.

In summary, all students acquired new English vocabulary words in both conditions for the current study. Additionally, two of the three students made better progress when instruction was provided in Spanish. In light of our findings, and considering past research with English language learners with ID, more research is needed to determine the impact of instructional language (e.g., Spanish or English) on vocabulary development for students with ID.

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APPENDIX A

Social Validity Questionnaire

Teacher name: _____

Date: _____

Please respond using the following: 1=Strongly Agree, 2=Agree, 3=Neutral, 4=Disagree, and 5=Strongly Disagree

- 1) English language learners with intellectual disability should be provided with instruction in their native language until they become familiar with English content? 1 2 3 4 5
- 2) English language learners with intellectual disability should be provided with instruction only in English until they become familiar with English content? 1 2 3 4 5
- 3) This intervention is a practical way to teach vocabulary to English language learners with intellectual disability. 1 2 3 4 5
- 4) Overall my student benefited from the intervention. 1 2 3 4 5

Additional comments:

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