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Maria Dolores Resendiz

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The Dissertation Committee for Maria Dolores Resendiz Certifies that this is the approved version of the following dissertation:

The Role of Experience in Acquisition of English Grammar

Committee:

Elizabeth Peña, Supervisor

Lisa Bedore

Courtney Byrd

Li Sheng

Sharon Vaughn

The Role of Experience in Acquisition of English Grammar

by

Maria Dolores Resendiz, B.S.C.S.D.; M.A.

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Dedication

This dissertation is dedicated to my parents who have been amazingly supportive throughout my career as a student here at the University of Texas at Austin. I would also like to dedicate this dissertation to my sister, who is now Dr. Esther Resendiz, for always being understanding about what the Ph.D. experience is really like. And last but not least I would also like to dedicate this dissertation to Richie for his help by being an invaluable resource in the creative uses of technology, as well as always being a good listener.

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The Role of Experience in Acquisition of English Grammar

Maria Dolores Resendiz, Ph.D.

The University of Texas at Austin, 2011

Supervisor: Elizabeth Peña

Children learn language through experience by hearing and speaking the target language (Lany & Gomez, 2008; Rinaldo & Caselli, 2008). Children with different levels of experience with English would be expected to perform differently on linguistic tasks, including grammatical performance, depending on the amount of experience they have with English. Previous studies have found differences in grammatical performance depending on the amount of English the child speaks at home and school and socioeconomic status (SES) (Gathercole, 2002a; 2002b). DeBot (2000) proposes an adaptation of Levelt's (1993) blueprint of the speaker, where he postulates that individuals who have more experience with a second language will present with less influence from the first language. The current study aims to evaluate changes made from pre-test to post-test, as well as performance at pre-test and post-test in the use of grammatical and Spanish-influenced utterances by Spanish-English bilingual children with different amounts of experience with English. We also evaluated the grammaticality of the Spanish-influenced utterances produced. Eighty-four Spanish-English bilingual kindergarten age children with typically developing language participated in the pre-test, narrative intervention, and post-test. Children's current use of English ranged from 3% to 100% of the time during a typical week, based on parent and teacher reports. We also evaluated the role of mother SES (using weighted values for mother's level of education and mother's occupation); scores ranged from 0 to 58. Consistent with predictions from DeBot's (2000) adaptation of Levelt's (1993) blueprint of the speaker, results show that

experience with English did make a difference in performance. Children who had more experience with English produced more grammatical utterances and fewer Spanish-influenced utterances. Overall, a small amount of Spanish-influenced utterances were used, but when Spanish-influenced utterances were used, they were more likely to be ungrammatical. Consistent with previous studies, experience appears to be predictive of performance in the use of grammatical and Spanish-influenced utterances in English. Clinically, results demonstrate the importance of understanding the client's experience with English when evaluating language performance. Future studies are needed to determine if similar patterns are evident in bilingual children with language impairment.

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CHAPTER 1: REVIEW OF THE LITERATURE

Children learn language skills, including grammatical skills, by hearing and speaking the target language (Au, Oh, Knightly, Jun, & Romo, 2007; Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010; Lany & Gomez, 2008; Parra, Hoff, & Core, 2011; Rinaldi & Caselli, 2009; Windsor & Kohnert, 2004). Performance on language tasks in part reflects these linguistic experiences (Windsor, Kohnert, Loxtercamp, & Kan, 2008). For bilinguals, linguistic performance may differ depending on the language in which they are being evaluated (Kohnert & Danahy, 2007). Given that language performance is reflective of different language, cultural, and social experiences, children with different levels of experience with English are expected to perform differently in grammatical acquisition. But differences across different levels of language experience are not well documented. Information about typically developing children with varying amounts of experience with English can inform clinical practice about what is typical language development along the bilingual continuum.

Bilingual children learning English and Spanish vary in their acquisition of English grammar relative to the current amount of use of English, contact with Spanish, and socioeconomic status (Gathercole, 2002a; 2002b). DeBot's (2000) model of the bilingual adaptation of Levelt's (1993) "blueprint of the speaker", a model of speech production, proposes that as children have more experience (defined as amount of use) with a second language, there will be less influence from the first language on the second language. Children from lower socioeconomic status (SES) also perform differently on language tasks than children from higher SES, but the gap between children from low SES and high SES decreases as children get older (Reynolds & Fish, 2010; Ginsborg,

2006). The process by which children make shifts in grammaticality however is not well described. It is unknown whether children make incremental or more wholesale changes in grammaticality; and what constitutes these changes. Examination of grammatical changes made in response to a general narrative learning task may provide documentation about the nature of these short term grammatical changes. Thus, the goal of the current study is to explore the role of first and second language experience by evaluating children's narrative production and short-term grammatical learning in English in response to narrative intervention, including influence from L1 to L2 and grammaticality.

Bilingual Adaptation of Levelt's Blueprint of the Speaker

DeBot's (2000) adaptation of Levelt's (1993) blueprint of the speaker postulates that as proficiency in a second language increases, the amount of cross-linguistic influence from the first language will decrease. DeBot does not claim to explain bilingual language *development* per se, but there is support for the model when evaluating the grammatical performance of both adults (Treffers-Daller, Ozsoy, & van Hout, 2007; Sunderman & Kroll, 2006) and children (Radford, Kupisch, Koppe, & Azzaro, 2007; Jia, Kohnert, Collado, & Aquino-Garcia, 2006; Muñoz, Gillam, Peña, & Gulley-Faehnle, 2003; Pearson, 2002). In general, findings indicate that individuals who use a second language more have less influence from the first language, and thus produce more grammatically acceptable forms in the second language. For example, Silva-Corvolan and Montarini (2008) describe the language production of a child who spoke English as a first language and Spanish as a second language. The child produced the Spanish locative construction based on how it would be expressed in English, "Aquí estamos" ("Here we are") rather than using the more common construction "Llegamos" ("We've arrived"). In

this example, the utterance is grammatical, but the grammatical rules of English are influencing the Spanish utterance because the statement “Aquí estamos” is a direct translation of the English form, which results in a form that is unexpected from a native monolingual Spanish speaker

Levelt (1993) proposed the blueprint of the speaker (see Figure 1), a model of speech production which includes a conceptualizer, a formulator, and articulator. The conceptualizer is where macroplanning takes place; semantic representations are found in the conceptualizer. Microplanning occurs at the formulator and articulator levels. In the formulator, grammatical and phonological rules of a given language are applied. The lemma contains both meaning and syntax. The articulator consists of production of the message, where lexical items are matched with the meaning of the lemma. For example, if a person who speaks only English saw a girl running and wanted to describe it to another monolingual English speaker, the concept of running would be found in the conceptualizer. The word “run” is retrieved from the lexicon. In the formulator, the person adds the third person singular “-s” to grammatically encode the word “run” to form the word “runs,” producing the correct syntactic form. The word is then phonologically encoded using the phonological rules of English and the person then produces the sentence “The girl runs” employing the articulatory system.

DeBot (2000) (see Figure 2) proposes an adaptation of Levelt’s (1993) blueprint of the speaker for bilingual speakers. This adaptation proposes that the macro-planning is not language specific, while the microplanning is language specific. Macroplanning refers to the concept or message that the speaker is trying to communicate. Macroplanning takes place at the conceptualizer, which is not language specific, but may

be where the decision about language choice is made. Microplanning includes grammar and lexical choice. Microplanning at the formulator level is separate for each language. There are separate lexicons for different languages, with some overlap. For example, the words run, jump, and swim are examples of English lexical items, and correr (run); brincar (jump) and tirar (throw) are examples of Spanish lexical items. Additionally, the lemma contains meaning and syntactic information, which is language specific. The translation equivalents jump/brincar mark tense in language-specific ways. For example, in English for the past tense third person singular form *he jumped*, the root word *jump* is marked by adding an *-ed* (to signify past tense) to make *jumped* and the third person singular form must be marked with the pronoun *he* to form the phrase *he jumped*. In Spanish, the word *brincar* is marked by combining the root *brinc* and *ó*, which signifies time (past), person (3rd person), and number (singular) (Terrell & Salgués de Cargill, 1979). Finally, the articulator consists of the sounds and prosodic patterns for the specific languages. Using the previous example of the girl who was running, a Spanish-English bilingual speaker who speaks Spanish as the L1 and English as the L2 communicating what they saw to a monolingual English speaker, DeBot (2000) postulates that the decision to use English would be made in the conceptualizer. The process would then be similarly carried out with the bilingual speaker formulating the sentence “The girl runs.” While the model addresses the similarities of the languages being learned as well as the individual’s proficiency in the languages, there is little evidence regarding whether there is single or dual storage of morpho-phonological information. Neither Levelt’s (1993) nor DeBot’s (2000) models are intended to explain language development; however DeBot (2000) states that a bilingual model of language

production should describe the bilingual system of an individual at any point in time and at different stages of development. Thus, this model is used to better understand children's grammatical productions at different levels of English language experience.

Utterances produced by children are either grammatical or ungrammatical and influenced or uninfluenced. Grammatical *accuracy* is the production of utterances that follow the grammatical rules of the target language. In contrast, grammatical *influence* in this model is defined as utterances that show evidence of the grammatical rules from the other language the individual speaks. Influenced utterances can result in utterances that follow the grammatical rules of the first language or utterances that do not follow the grammatical rules of the first language, resulting in influenced grammatical, influenced ungrammatical, influenced ungrammatical, and uninfluenced ungrammatical utterances. DeBot (2000) makes predictions about grammatical influence, but not grammatical accuracy.

According to DeBot (2000), cross-linguistic influence from a child's first language will decrease as a child gains more experience with a second language. For example, children may produce utterances that follow the grammatical rules, such as word order or adjective placement, of their first language when learning a second language as in the sentence, "The ring was in the nest of the bird." The possessive form, "the bird's nest" is more common in English; however the child used a form to show possession that is more common in Spanish. The rules for English syntax, however, are not violated. As they are exposed to academic instruction in a second language and make changes and adaptations to their language use, children with the most experience with a second language will be likely to demonstrate the least amount of influence from the first

language, and decrease their use of ungrammatical utterances and increase their use of grammatical utterances more than children who have less experience with the second language.

First language influence can also lead to ungrammatical productions if the utterance produced in the second language is ungrammatical by the rules of the second language, but follows the rules of the first language. These types of productions would be considered ungrammatical influenced utterances. For example lexical, morphological, and word-order influences from the first language can result in ungrammatical productions in the second language (Dopke, 2000) as in the utterance “the lizard blue”. Lexical choices can make an utterance grammatical or ungrammatical, depending on the word that is produced. For example, if the word produced is a noun, the utterance will not necessarily be ungrammatical, as in the utterance “The perro (dog) was mad at the cat.” However, if the word produced in the non-target language is a verb, the verb morphology is likely to render the utterance ungrammatical. For example, German has a greater number of morphemes and more complex morphology than English. If a verb from English is used, there may be an error in the verb morphology because of the differences between the languages (Dopke, 2000). For example, a child might say “The frog *kickó* the little frog,” because the Spanish morpheme for past tense is *ó*, which the child used with the English verb *kick*. The child took the morpheme used in Spanish to mark past tense and combined it with the English verb *kick*, which makes the utterance ungrammatical. Morphological errors, such as overgeneralizations (ex: runned) or omissions (ex: he jump), can also make an utterance ungrammatical. Finally, word order that does not follow the rules of the target language can make the utterance

ungrammatical as well (ex: the frog green) (Boumans, 2006). For example when using the possessive form, Arabic-Dutch bilinguals applied the grammatical rules of Dutch by reversing the word order typically used for possessive forms in Moroccan Arabic. An example from Greek-English bilinguals illustrates the notion that children who had more experience with English produced syntactic structures that presented with cross-linguistic influence. Here, English-dominant Greek-English bilinguals were reported to produce ungrammatical pre-verbal subjects in what-embedded interrogatives where post-verbal subjects were the grammatical option (Argyri & Sorace, 2007). Argyri and Sorace (2007) provide the following example, when asked (in Greek) “What happened to Maria’s pencil?” an English dominant Greek-English bilingual speaker might respond by producing a pre-verbal subject in Greek (“@I Hara to pire”, which literally translates to “the Hara it took”) instead of using a post-verbal subject in Greek (“Ti pire I Hara”, which literally translates to “it took the Hara”) which would be the expected grammatical form because in English the subject can proceed the verb. While more research has focused on static measures of grammaticality and influence, there is less information on changes that take place as children gain more experience with a second language.

Changes Related to Experience

The process by which children make these grammatical shifts however is not overtly postulated in DeBot’s (2000) adaptation of Levelt’s (1993) blueprint of the speaker. It is unknown whether children make incremental or more wholesale changes; and what constitutes these changes. Experience with language has been shown to affect performance on static and developmental measures of linguistic production tasks

(Conboy & Thal, 2006; Gathercole, 2002a; 2002b). Changes have been documented for utterance length, vocabulary, and word types.

In terms of incremental changes on specific grammatical forms comparing Spanish-English bilingual children and monolingual English speaking children, changes related to experience have been documented. For example, a study of mass/count nouns and that-trace was conducted using 149 2nd grade students and 162 5th grade children who were divided into groups based on language of instruction in the classroom (monolingual English classrooms, children in English immersion classrooms, children in two-way Spanish-English bilingual classrooms, and monolingual Spanish speaking classrooms), language spoken at home (only Spanish, only English, both Spanish and English) and socioeconomic status (SES) (high and low) using puppets as speakers that had to be corrected. Gathercole (2002a; 2002b) found that 2nd grade monolingual English speaking children scored higher on measures of mass/count nouns and that-trace followed by bilingual children from English immersion classrooms (all instruction is in English), followed by the bilingual children from two-way instruction classrooms (instruction in English and Spanish). Children from the English immersion classrooms who were from high SES performed better than the children from low SES. Children who were from homes where English and Spanish were spoken and who were enrolled in English immersion classes performed better on mass/count nouns and that-trace compared to children who were in English immersion classes and were from homes where only Spanish was spoken. These differences between the groups, however, were not apparent in 5th grade. This finding suggests that the children had different trajectories of change, depending on the amount of previous experience they had with English to eventually

perform at similar levels. Acquisition of target forms followed the same order for both bilingual and monolingual children as follows: nouns (count nouns then mass nouns) followed by quantifiers (many, much + singular nouns, much + plural nouns) (Gathercole 2002a; 2002b). Therefore, there does appear to be an initial “lag” in bilingual children’s performance in comparison to monolingual English speakers on some morphosyntax tasks. But, children seem to “catch up”; their performance becomes more similar to that of monolingual learners as bilingual children get older and gain more experience with English (Gathercole, 2007). The initial lag is caused by the differences in experience with English. As children get older, they increase their grammatical accuracy and reduce the amount of influence. Despite variations in cumulative experience with English, all children performed similarly on the task in 5th grade.

Increases in the use of Spanish-influenced utterances allow children to produce more complex utterances in the context of narratives. Fiestas and Peña (2004) found that 4- to 6-year-old children who had a good command of the English language used Spanish-influenced utterances most when telling a narrative using a wordless picture book. The use of Spanish-influenced utterances during the narrative task possibly allowed the children to tell more complex stories in English than if they had not drawn on their grammatical knowledge of Spanish and used simpler sentences that only followed the grammatical rules of English. Spanish-influenced utterances included verb usage, pronoun omission, and syntactic influences. The increased use of Spanish-influenced utterances allowed the children to produce more complex utterances, even if the utterances were not grammatical. Language use and home environment are associated with SES (Hoff, 2003). Because studies have found that differences in language use

affect language development, it is important to identify if the differences are due more to the language use, SES, or a combination of both language use and SES.

Socioeconomic Status

SES is theoretically a means of obtaining information about the child's environment (Gottfried, Gottfried, Bathurst, Guerin, & Parramore, 2003). A number of factors are associated with SES including family income, level of maternal education, home environment, interactions between mother and child, and the quantity and quality of speech to which the child is exposed (Ginsborg, 2006). It is presumed that SES influences the child's development of language (Hoff, 2003). Children from higher SES have been found to receive higher scores on language assessments than children from lower SES (Reynolds & Fish, 2010). SES has also been used to predict growth that occurs in language development (Pungello, Iruka, Dotterer, Mills-Koonce, & Reznick, 2009).

The quality of adult input has been shown to be related to SES and affect lexical and syntactic performance on static measures as well as longitudinal developmental measures in the areas of lexical growth, sentence complexity, and morphological skills. For example, 2-4 year old children who were monolingual English speaking or spoke English as a dominant language showed differences in complex syntax development (Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010). Monolingual speakers of a morphologically rich language, such as Hebrew, who are from low SES backgrounds, have poor morphological skills in comparison to children from high SES (Ravid & Schiff, 2006). Spanish-English bilingual children's (ages 4;0 – 5;11) amount of input in Spanish and English was found to be mediated by the mother's level of education.

Children whose mothers had more education received more input in English than children whose mothers had less education (Bedore, Peña, Joyner, & Macken, 2011). While SES appears to be a contributing factor, there are differences in how SES is measured.

Different components of SES include parent education, family income, and occupation. Maternal education, as a component of SES, was found to differentiate poor readers from typical readers (Fluss, Ziegler, Warszawski, Ducot, Richard, & Billard, 2009). Mother education was the strongest predictor of mother infant interactions (Bornstein, Hahn, Suwalsky, & Haynes, 2003). High SES mothers have been found to talk to their children more than mothers from lower SES (Hoff-Ginsberg, 1991). SES along with gender, has been shown to influence language use (Washington & Craig, 1998). SES, which has been found to be mediated by caregiver input has also been found to be related to language growth as well, (Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010). While the current study focuses on identifying factors that predict changes in language development for children along the bilingual continuum including SES and language use, previous studies have used case studies to evaluate language development comparing bilingual to monolingual children in the area of grammaticality.

Case Studies

There are similarities and differences between bilingual and monolingual language development consistent with DeBot's prediction that different experiences with language result in different amounts of influence. Similarities are documented using case studies in the development of root infinitives, subject omission, and determiners. For example, two simultaneous bilinguals, a Dutch-French bilingual child (2;3-2;10 years)

and a German-Italian bilingual child (1;8-3;1 years), were observed to develop root infinitives similarly to Dutch and German monolingual children respectively (Hulk & Muller, 2000). In a case study of German-French bilinguals a child was observed from ages 2 through 4. Similar to monolingual children, the child omitted subjects when the first verbs were produced (Bonnesen, 2009). Four German-Italian bilingual children (1;6 to 2;11) were observed and those whose Italian was developing faster than German developed determiners similarly to monolingual children (Kupisch, 2007).

Some of the same case studies have also documented areas of development that are different from monolingual development (Hulk & Muller, 2000; Kupisch, 2007). These findings are consistent with the prediction that the first language will influence productions in the second language. For example, object drop appeared to be different from monolingual development and was susceptible to cross linguistic influence in a case study of a Dutch-French and German-Italian bilingual children; bilingual children dropped the object in French and Italian more than French and Italian monolingual speaking children. The explanation proposed for the cross-linguistic influence is that Dutch and German are topic drop languages, while French and Italian are not (Hulk & Muller, 2000). Thus, the fact that Dutch-French and German-Italian bilingual children omitted the object in their second languages of French and Italian, respectively, suggests that they were extending the object drop rule from their first languages of Dutch and German, respectively. In another study similar results were documented. Four German-Italian bilingual children ages 1;6 to 2;11 were observed. The balanced German-Italian speaking children showed a slight delay in onset of determiner use in Italian compared to monolingual Italian speakers in Italian. Children acquiring a Romance language, such as

Italian, develop determiners earlier than children developing a Germanic language. There appears to be evidence of an increased crosslinguistic influence of German on Italian for children who have less experience with Italian (Kupisch, 2007). Based on observations in the above study, the influence of German on Italian was observed in the area of determiners, while in other areas it appeared that the bilingual children were comparable to monolingual Italian speaking children. The differences and similarities between bilingual and monolingual children make it important to identify expected differences in grammatical developmental, both in short term and the long term.

Short-Term Changes in Language

Short-term changes of children's language learning in the areas of verbs, vocabulary, and narrative length have been evaluated using fast mapping tasks, quick incidental learning (QUIL), and dynamic assessment, respectively. In a study of young typically developing monolingual speakers of English and Spanish (3;0-3;9 years), subjects demonstrated the ability to learn novel verbs in English and Spanish, respectively when the verb had the same morpheme between the first exposure to the word and at the time of testing. But 3-year-old children did not have enough experience to use the inflectional morphology as cues for learning new verbs with morphemes that were different from the time of first exposure and time of testing in English or Spanish (Bedore & Leonard, 2000). Younger children do not have enough experience with language to accurately use and apply inflectional morphology when learning and using new words.

Older monolingual English speaking children (6-8 years old) demonstrated gains in learning labels during a quick incidental learning (QUIL) task (Oetting, Rice, &

Swank, 1995). Children were shown 12-minute video clips and then completed a picture comprehension task. While children demonstrated gains for all word types (object, attribute, action, affective state), they had the greatest gains for object labels. The use of grammatical rules, specifically verb morphology continues to be an area of difficulty for 6-8 year old children.

Dynamic assessment (DA) provides more exposures to grammatical targets because it focuses on teaching children to use metacognitive strategies rather than only showing them new information, which, although not targeted directly, includes modeling of different correct grammatical forms. In a study of first and second grade English speakers who participated in DA, children with typical development who participated in two mediated learning experience (MLE) sessions significantly increased the number of grammatical utterances, produced more complex sentences, and produced a higher number of different words in English during a post-test narrative task (Resendiz, Bedore, & Peña, 2008). Therefore, after participating in a Dynamic Assessment of narratives task, children who were the same age as children who had difficulty with grammaticality in previous studies, made improvements in grammatical performance after increased exposure to correct grammatical forms through individual MLE sessions. This study served as the motivation for exploring grammatical changes, changes in the use of influenced utterances, and the use of influenced utterances to achieve more grammatically correct sentences.

The aim of the current study is to identify the influence of the first language on the second language by evaluating grammatical performance and changes that take place during a dynamic assessment of narratives task. Because we are looking at grammatical

changes, experience will be defined as current output of English (Bohman, Bedore, Peña, Mendez-Perez, & Gillam, 2010). Similar to Gathercole (2002a; 2002b) SES will be taken into consideration to determine if the differences in experience are possibly due to a combination of English output and SES factors, or are mainly due to the amount of output with English. The following questions are explored:

1. Are there differences between pre-test and post-test performance on English grammaticality and use of Spanish-influenced utterances for Spanish-English bilingual children in a Dynamic Assessment of Narratives task?
2. What exposure and environmental factors (English output at home, English output at school, mother SES) predict the number of grammatical English utterances produced by Spanish-English bilingual children at pre-test and post-test on a Dynamic Assessment of Narratives task?
3. What exposure and environmental factors (English output at home, English output at school, mother SES) predict the number of Spanish-influenced utterances produced by Spanish-English bilingual children at pre-test and post-test on a Dynamic Assessment of Narratives task?
4. Are Spanish-influenced utterances produced by Spanish-English bilingual children during a Dynamic Assessment of Narratives task more likely to be grammatical or ungrammatical?

Consistent with DeBot (2000) we predict that there will be changes from pre-test to post-test as children gain experience during the MLE sessions. We also predict that as children have more experience with English, they will produce more grammatical utterances and there will be less influence from Spanish on utterances produced in

English. Similar to Gathercole (2002a; 2002b) we predict that children from a higher mother SES will produce more grammatical utterances and fewer influenced utterances than children who are from a lower SES. We also predict that when children produce influenced utterances, the utterances will be grammatical. This is similar to results found by Resendiz, Bedore, and Peña (2008) where older children who had more experience with English demonstrated gains in both grammaticality and sentence complexity. Since the children in the current study are younger and have less experience with English, we might not expect to see great gains in sentence complexity, but it is reasonable to expect changes in grammaticality, which might be mediated by the use of influenced utterances.

CHAPTER 2: METHODS

Participants

A total of 84 students enrolled in kindergarten classrooms in central Texas participated in the current study . Of the 84 participants, 65 were drawn from a longitudinal study (n = 186), that focused on markers of language impairment in Spanish/English bilingual children, at the second time point at kindergarten age. Another 19 were recruited from the screening phase of the current study (early kindergarten) and were tested when they were in kindergarten (See Table 1) to increase the range of English experience represented. All children demonstrated typical development based on their test scores on the Bilingual English Spanish Assessment (BESA) (Peña, Gutierrez-Clellen, Iglesias, Goldstein, & Bedore, in press), and the Universal Nonverbal Intelligence Test (UNIT) screener (Bracken & McCallum, 1998) (see Table 2).

Of the eligible 89 children, five children were excluded from the study. One subject was excluded from the current study because they did not score in the average for intelligence, as measured by the UNIT screener. Two subjects were excluded because they did not produce at least 6 utterances at pre-test and post-test in English to be analyzed. Two additional subjects were excluded because they did not complete the pre-test task. As a result, there were a total of 84 participants.

Children ranged in age from 5;2 to 6;7 years (M=5;11, SD=4.5 months) at the time of testing. All children presented with typically developing language. All participants were identified as Latino/Hispanic by their parents during a parent interview. Participants' total English output ranged from 3% to 100% of the time during a typical week, according to parent and teacher interview information at the time of testing

(kindergarten). Children's English output at home ranged from 0% to 100% of the time (see Figure 3), while children's English output at school ranged from 0% to 100% (see Figure 4). Total Spanish output during a typical week ranged from 0% to 97%. Children's Spanish output at home ranged from 0% to 100%; children's Spanish output at school ranged from 0% to 100%. All children passed a hearing screening based on results from the school nurse at the time of screening (pre-kindergarten or kindergarten). SES scores for mother SES ranged from 0 to 58 ($M = 18.1$, $SD = 15.0$) (see Figure 5).

SAMPLING PROCEDURES

Inclusionary criteria for all subjects were that they perform within normal limits on the BESA in their stronger language in morphosyntax and semantics. On the BESA English morphosyntax subtest scores ranged from 2 to 61 ($M = 35$, $SD = 17$). BESA English semantics subtest scores ranged from 12 to 42 ($M = 27$, $SD = 7$). The Spanish morphosyntax and Spanish semantics subtests of the BESA were administered to children from the Diagnostic Markers grant and children recruited for the current study who spoke English less than 80% of the time during a typical week. BESA Spanish morphosyntax scores ranged from 13 to 72 ($M = 46$, $SD = 13$). BESA Spanish semantics scores ranged from 13 to 42 ($M = 27$, $SD = 5$). Total BESA scores for all children were calculated using the better score in morphosyntax and the better score in semantics. Total BESA scores ranged from 45 to 114 ($M = 82$; $SD = 14$). Children's English language input/output ranged from 3% to 100% at the time the screening was completed. Parents of children who participated completed a parent interview and children participated in a battery of language tests including dynamic assessment.

Participants and their families were not paid for participation in the DM project or the current study. Children were rewarded with small prizes such as stickers.

MEASURES

Information about language use and exposure and SES were obtained via a parent questionnaire completed over the telephone or in person. The parent questionnaire consists of questions about amount of English use, including questions about hour by hour input and output of English and Spanish and mother SES. Information about highest level of maternal education and occupation for each child were also obtained during the parent interview. Teachers also completed a teacher questionnaire about language ability and hour by hour amount of English use. Teacher and parent data about language use were combined to calculate the percent of time the child used English and Spanish during a typical week. The parent questionnaire information was used from the time the child woke up until 8 am and from 3 pm until the child went to bed on the weekdays and all of the parent information was used for the weekend. The teacher questionnaire information was used from 8 am to 3 pm, as that is the time when children were attending school.

The BESA was used to rule out children who were performing below the average range in morphosyntax and semantics. The English morphosyntax subtest of the BESA has a reported sensitivity and specificity of 82.1% and 89.3%, respectively for children who are from the southwest and identified as English proficient. For children from the southwest who are identified as English dominant bilingual, the morphosyntax subset of the BESA has a reported sensitivity and specificity of 80% and 90%, respectively. These sensitivity and specificity demonstrate that the morphosyntax subtest can be used to

classify children as typically developing with fair accuracy (Gutierrez-Clellen & Simon-Cereijido, 2007).

The Universal Nonverbal Intelligence Test (UNIT) (Bracken & McCallum, 1998) abbreviated battery was used to determine that intelligence was not below average. For children 5 to 6 years old the UNIT has a reliability coefficient of .88. For Hispanic children, the reliability coefficient is .94. The UNIT abbreviated battery and standard battery have an inter-correlation of .91. In the area of validity, the UNIT abbreviated battery is correlated with the Woodcock-Johnson – Revised (1989/1990) with a correlation coefficient of .80. The K-BIT, another intelligence measure, is correlated with the UNIT abbreviated battery with a correlation coefficient of .71. Therefore, the UNIT abbreviated battery is an appropriate intelligence measure to use with the population in the current study.

Mother SES was calculated to determine if it held predictive value. Mother SES was calculated using the weighted values from Barratt's (n.d.) modified Hollingshead for mother's level of education and mother's current occupation from the information reported during the parent interview. Therefore, mother SES consisted of the weighted values of mother education and mother occupation. Mother SES has previously been shown to have predictive value in language development (Fluss, Ziegler, Warszawski, Ducot, Richard, & Billard, 2009).

Procedure

As part of the DM test battery, all participants completed Dynamic Assessment of Narratives (Miller, Gillam, & Peña, 2001). Dynamic Assessment of Narratives consisted of a pre-test, two MLE sessions, and a post-test, all of which were conducted in English.

Participants were seen for a total of three times to complete the Dynamic Assessment of Narratives task. Sessions were conducted on school grounds in a quiet location designated by school faculty. The first session consisted of the pre-test and the first MLE session. The second session consisted of the second MLE session. The final session consisted of the post-test. There were approximately two weeks from pre-test to post-test, which minimized the possibility of maturation effects.

Children's pre- and post-test narratives were audiorecorded using a microphone (Sony ECM-C115) clipped to the child's shirt and recorded on a digital recorder (Sony ICD-MS515). The MLE sessions were also digitally recorded using a digital video camera (Canon FS100). The digital recordings were then transferred to Dell (Optiplex GX620) computers using Digital Voice Editor 2 (version 2.4); the video recordings were transferred to DVD-R's.

The pre-test, *Two Friends* (Miller, 2000a), and post-test, *Bird and His Ring* (Miller, 2000b), narratives from the Dynamic Assessment of Narratives were transcribed and coded using Systematic Analysis of Language Transcripts (SALT) conventions (Miller & Iglesias, 2006). The transcripts were first transcribed by an undergraduate student trained in SALT transcription. To ensure that stories were reliably transcribed, stories were then checked by a second listener who listened to the audio sample again. Discrepancies were resolved by an independent transcriber, if necessary.

CODING AND ANALYSIS PROCEDURES

To evaluate children's grammaticality and use of Spanish-influenced utterances, grammatical and influenced utterances were coded at pre-test and post-test for each child. Grammaticality measures on the pre-test and post-test stories included: grammatical

uninfluenced utterances, grammatical Spanish-influenced utterances (e.g., utterances that follow the grammatical rules of Spanish but are also grammatical in English), ungrammatical Spanish-influenced utterances (e.g., word order that is acceptable in Spanish but not English), and ungrammatical uninfluenced utterances (see Table 3). Utterances were considered grammatical if they followed the grammatical rules of English. Utterances were considered ungrammatical if they did not follow the grammatical rules of English. Based on Kormos (2006), influence of an utterance was counted if there was evidence of: words or phrases produced in Spanish, lexical influence, overgeneralization or morpheme use, word order influence, or direct translation influence (see Table 4). Therefore, complete and intelligible utterances fell into one of four possible categories (see Table 3).

Transcripts were first coded by an undergraduate student in communication disorders who had been trained in SALT (Miller & Iglesias, 2006) and the coding system for influenced utterances (Kormos, 2006). Coding was then checked by a graduate student following the same coding system. Finally, the language samples were independently coded for reliability by a second graduate student in communication disorders. Reliability for coding was completed using the pre-test and post-test from 9 randomly subjected subjects, or 11% of the samples. Reliability for the coding of grammaticality and influence was 90% for the randomly selected samples.

Sample Size

The sample size was determined using G-power analysis. Regression analyses were completed with three predictor variables, which require a total of 45 participants. The children who were added for the current study had more experience with English

than children from the larger longitudinal study. Eighty-four subjects were included as part of the analysis to include a wider range of experience with English.

Two subjects were identified as outliers when testing for heteroscedasticity, most likely because they produced more utterances than the rest of the subjects. These two subjects were included despite being outliers because their inclusion and exclusion did not change any of the statistical significance of the results.

CHAPTER 3: RESULTS

The aim of the current study was to identify the influence of the first language on the second language by evaluating changes that take place in the areas of grammatical performance and production of Spanish-influenced utterances during a dynamic assessment of narratives task. To answer the first question about changes from pre-test to post-test, repeated measures ANOVAs were completed to determine if there were group changes. To answer questions two and three regression analyses were completed to determine if use of English and mother SES predicted use of Spanish-influenced utterances and grammaticality. To answer the fourth question about grammatical and ungrammatical influenced utterances, the repeated measures ANOVAS were evaluated for interactions between grammaticality and influence.

Pre-Test Post-Test Change

To answer question one about changes in grammaticality and use of influenced utterances, pre-test and post-test performance were compared using three levels of within subject variables: time, grammaticality, and influence and eight between subjects factors: uninfluenced grammatical utterances at pre-test, influenced grammatical utterances at pre-test, uninfluenced ungrammatical utterances at pre-test, influenced ungrammatical utterances at pre-test, uninfluenced grammatical utterances at post-test, influenced grammatical utterances at post-test, uninfluenced ungrammatical utterances at post-test, and influenced ungrammatical utterances at post-test. There was no main effect for time, $F(3,83) = 0.338, p = 0.563, \eta_p^2=0.004$; performance at pre-test and post-test were not statistically different (see Table 5). Grammatical utterances produced at pre-test and post-test were not significantly different, $F(1,83) = 1.680, p = .199, \eta_p^2=0.020$ (see Figure

6). There were no significant differences for use of influenced utterances produced at pre-test and post-test, $F(1,83) = 0.694$, $p = 0.407$, $\eta_p^2 = 0.008$ (See Figure 7). Raw values and percentages for grammaticality and influence were reported. While there were no significant group differences between pre-test and post-test there was great variability on performance of predicted variables (see Table 7).

There was no main effect for time; therefore performance at pre-test and post-test were evaluated separately. Comparisons between predictors at pre-test and post-test were then compared. The second and third questions evaluated the role of experience with English (measured here as English output) and mother SES on kindergarten age children's use of influenced utterances and use of grammatical utterances. Therefore, predictors (English output home, English output school, mother SES) for the dependent variables (grammatical, ungrammatical, influenced, and uninfluenced utterances) at pre-test and post-test were evaluated to determine if children who had more experience with English produced fewer influenced utterances and more grammatical utterances at pre-test and post-test using regression analyses. Regression models were completed at pre-test and post-test to determine if the predictors were the same at pre-test and post-test.

In order to perform regression analyses, we examined whether the predictor variables met the assumptions of multicollinearity and heteroscedasticity. Assumptions of multicollinearity include a tolerance greater than or equal to 0.2 and a variance inflation factor less than 4. Assumptions of multicollinearity were met, even though the predictor variables (English output home, English output school, and mother SES) were correlated (see Table 7). The lack of collinearity means that while one might hypothesize that the three predictor variables English output home, English output school, and mother SES

were highly correlated, their association does in fact meet the criteria of tolerance greater than or equal to 0.2 (.520, .513, and .615 respectively) and a variance inflation factor less than 4 (1.923, 1.949, and 1.626 respectively). Thus, while these variables are correlated including them together does not violate the assumption of multicollinearity.

Grammatical English Utterances

The second question addressed the role of English output home, English output school, and mother SES on grammaticality. At pre-test, results indicate that English output at home was predictive of the use of grammatical utterances. Children who spoke a greater percentage of English at home produced more grammatical utterances at pre-test, $F(3,83) = 10.038$, $p = .025$, $R = .523$ (see Figure 8). The percentage of time the child spoke English at home significantly explained was a significant predictor of grammatical utterances at pre-test. However, neither the amount of time the child spoke English at school nor the mother SES were significant predictors of the number of grammatical utterances (see Table 8).

Spanish-Influenced English Utterances

The third question addressed the role of English output at home, English output at school, and mother SES in predicting the use of influenced utterances. At pre-test, results indicate that English output at school was predictive of the use of influenced utterances. Children who spoke a higher percentage of English at school produced fewer influenced utterances at pre-test, $F(3,83) = 4.146$, $p = .01$, $R = .367$ (see Figure 9). The amount of English spoken at school was a significant predictor of influenced utterances at pre-test, while neither the amount of English output at home nor the mother SES were significant

predictors of the use of influenced utterances at pre-test (see Table 8). At post-test results indicated that mother SES was predictive of the number of uninfluenced utterances produced by the child. Children whose mother had a higher SES score produced more uninfluenced utterances at post-test, $F(3,83) = 3.605$, $p = .05$, $R = .345$ (see Figure 10). The level of the mothers SES was a significant predictor of the number of uninfluenced utterances produced at post-test. However, neither the English output home nor the English output school were significant predictors of the use of uninfluenced utterances at post-test (see Table 9).

Grammaticality of Spanish-Influenced Utterances

To answer question four about the use of influenced utterances, the repeated measures ANOVA was evaluated for grammaticality and influence. There were main effects for grammaticality, $F(3,83) = 6.901$, $p = 0.010$, $\eta_p^2=0.077$, and influence, $F(3,83) = 328.120$, $p < 0.001$, $\eta_p^2=0.798$ (see Figure 11). Overall, there were more grammatical utterances than ungrammatical utterances produced and more uninfluenced utterances than influenced utterances. There was also a significant grammaticality x influence interaction, $F(3,83) = 20.195$, $p < .01$, $\eta_p^2=0.196$. When children produced uninfluenced utterances, there were more grammatical utterances than ungrammatical utterances. However, when children produced influenced utterances, there were more ungrammatical utterances than grammatical utterances, although the difference was small. Another important point to keep in mind is the low number of influenced utterances.

CHAPTER 4: DISCUSSION

The purpose of the current study was to evaluate the influence of the first language on the second language using a Dynamic Assessment of narratives task. Based on DeBot's (2000) model we expected that children who had more experience with English would decrease the number of influenced utterances and increase the number of grammatical utterances produced from pre-test to post-test. There were not any differences between pre-test and post-test performance in the areas of influence and grammaticality. The current study also aimed to identify what predicted performance in the areas of grammaticality and influence at pre-test and post-test. Production of grammatical and influenced utterances at pre-test and post-test were predicted by different, yet correlated, variables; this will be discussed later in this section. At pre-test the amount of English output at home and the amount of English output at school were predictive of the number of grammatical utterances and the number of influenced utterances at pre-test, respectively. At post-test, the number of uninfluenced utterances produced was predicted by mother SES. I also hypothesized that influenced utterances produced by children would be more likely to be grammatical. While there were no changes from pre-test to post-test in the areas of grammaticality and influence, children's use of influenced utterances were more likely to be ungrammatical than grammatical although they occurred very infrequently.

Children's performance at pre-test and post-test supports DeBot's (2000) adaptation of Levelt's blueprint of the speaker. While different predictor variables (English output home, English output school, and mother SES) predicted unique variance in the model, the predictor variables were all significantly correlated (see Table 7).

Consistent with Bohman, et al (2010), mother SES and English output were correlated ($r = 0.560, p = .01$) (see Figure 13). Mother SES and English output school were also correlated ($r = 0.654, p = .01$) (See Figure 14). English output home and English output home were also significantly correlated ($r = 0.654, p = .01$) (See Figure 12). Given that the three predictor variables were all correlated, overall we can say that experience did make a difference in performance on the use of influenced utterances and grammatical utterances. The ways in which children gain experience may have some variability. For example, some children may produce more English output at home, while other children may present with more English output at school. Each of the contexts in which they are using English whether it be at home with family or at school with peers and teachers have some sort of contribution to their performance in the use of influenced and grammatical utterances. The more experience children had with English the fewer influenced utterances they used and the greater the number of grammatical utterances they produced.

Children who had more experience with English produced fewer influenced utterances. When producing a narrative, children retrieved the lexical items they needed from the lexicon. Children then grammatically encoded the lexical items they had chosen. Influences from the first language mainly involved using word orders that were more characteristic of the second language than the first. Children, for the most part, encoded the lexical items for words produced in English using uninfluenced morphology. Although the rules were sometimes applied incorrectly, there was no apparent evidence of influence from Spanish on English. The accuracy of encoding the lexical items is not specifically addressed in DeBot's (2000) model; this could be due to the fact that the

majority of influences, at least for kindergarten age children, involve word order and word choice, not morphology.

While overall changes were not observed for children, there were some children who made great gains when evaluated individually. In the area of grammaticality children who increased and decreased the number of grammatical utterances they produced the most and children who did not demonstrate any changes did not exhibit any clear patterns as far as amount of English output at home or school. In the area of decreasing the use of ungrammatical utterances, the child who decreased the number of ungrammatical utterances presented with 45% output of English at home, 36% output of English at school, and a mother SES of 12. Perhaps the low output of English provided this particular child with many opportunities to improve by producing fewer ungrammatical utterances. In the area of influenced utterances, children who decreased their use of influenced utterances presented with lower amounts of English output. For example the child who decreased their use of influenced utterances the most spoke English 50% of the time at home and 25% of the time at school. Two other children who also decreased their use of influenced utterances had 21% and 15% output English at home and 17% and 39% English output at school, respectively. The child who increased their use of uninfluenced utterances the most presented with 18% English output at home, 96% English output at school, and a mother SES of 21. Other children who increased their use of uninfluenced utterances presented with English output amounts of 18%, 0% and 56%, English output amounts of 96%, 18%, and 100% at school, and mother SES of 18, 38, and 3 respectively. Three of the four children who presented with increases in the use of uninfluenced utterance used English more at school than at home. While there

appear to be some patterns when evaluating children, it is also important to keep in mind that for the children who made no changes, there was also great variability in their amounts of English output at school and home as well as mother SES.

Changes, or the lack thereof, from pre-test to post-test are not consistent with predictions made by DeBot's (2000) adaptation of Levelt's blueprint of the speaker (1993), which would have predicted that children would demonstrate changes from pre-test to post-test based on their increased experience with uninfluenced grammatical utterances produced by the examiners during the intervention sessions. Despite children's increased experience with English, changes were not observed for the children as a group. The lack of observation of incremental changes is consistent with previous studies that evaluated changes over extended periods of time rather than short-term changes from two intervention sessions (Gathercole 2002a; 2002b; 2007). Evaluating more long-term changes has previously provided more conclusive decisions about the validity of DeBot's model when evaluating the language development of bilingual children (Gathercole 2002a; 2002b; 2007). There appear to be differences on static measures and when evaluated cross-sectionally; one might hypothesize that changes could be observed if subjects were evaluated over a longer period of time. For example, previous studies with younger children have demonstrated differences in performance in the area of syntax with children who have different amounts of experience with English. Children as young as 1 year old with typically developing language have demonstrated differences in language performance based on their exposure to language (Lany & Gomez, 2008). Bilingual English-Spanish speaking children who were 22 months old also demonstrated differences in phonological memory skills based on their exposure to

English and Spanish. Correlations between English and Spanish exposure and vocabulary and grammatical development were found at 25 months of age (Parra, Hoff, & Core, 2011). Changes in the use of grammatical utterances have been observed in first and second grade children from culturally and linguistically diverse backgrounds using a similar task (Resendiz, Bedore, & Peña, 2008). Perhaps kindergarten age children are not quite ready to benefit from the experience during the intervention sessions in the same way as older children who have more experience with English. Another possibility is to observe the bilingual children's development for a longer period of time or to have children participate in a greater number of intervention sessions to capture changes that occur.

SES has previously been found to influence bilingual children's language development, with children from low SES reported to have a disadvantage compared to children from high SES (Scheele, Leseman, & Mayo, 2010). While there was a unique predictive value of mother SES in the use of uninfluenced utterances at post-test, mother SES has been correlated with amount of English input (Bedore, Peña, Joyner, & Macken, 2011). Taking into consideration previously reported correlations along with the correlations from the current study (Table 7), mother SES does appear to affect the use of influenced utterances and grammatical utterances. Furthermore, the current study's results indicate that mother SES was predictive of how the child performed after a short-term intervention session. This study suggests that it is possible that children from lower SES are at a disadvantage in the area of grammaticality and use of influenced utterances when producing narratives. SES may also be an indicator of how children from lower and higher SES perform after being presented with a model, as demonstrated by its

unique predictive value at post-test. The children who were from higher SES produced more uninfluenced utterances than children who were from lower SES. Perhaps another explanation is that the children from higher SES had more available standard models since amount of English output and mother's level of education have been shown to be correlated (Bedore, Peña, Joyner, & Macken, 2011). Input has been shown to be correlated with output (Dehower, 2007), which would suggest that mother's level of education would also be correlated with the child's amount of output in different languages. The reported correlation of mother's level of education and the amount of English input the child receives suggests that the results of children's increased use of uninfluenced utterances who are from a higher SES are in fact consistent with predictions of DeBot's (2000) adaptation of Levelt's blueprint of the speaker (1993). The process of learning to produce grammatical utterances and the use of influenced utterances is a fluid process that has the potential of changing as children get older and gain more and different experiences with English.

Children's use of influenced utterances was minimal, with children producing an average of 2 influenced utterances at pre-test ($SD = 2$) and 2 influenced utterances at post-test ($SD = 3$); however there was much variability among the individual children with one child producing as many as 10 influenced utterances at pre-test and a different child producing as many as 14 influenced utterances at post-test. Other children did not produce any influenced utterances at pre-test or post-test. The fact that the influenced utterances were more likely to be ungrammatical is consistent with previous studies, where influenced utterances were identified as ungrammatical because children were reported to overgeneralize object drop (Hulk & Muller, 2000), omit determiners

(Kupisch, 2007), omit pronouns (Fiestas & Peña, 2004), and use incorrect syntax (Fiestas & Peña, 2007). Other studies have found that children produce influenced utterances that follow the grammatical rules in the areas of root infinitives (Hulk & Muller, 2000). The results of the current study are consistent with the results of previous studies. Most of the observed Spanish-influenced utterances had syntax that was more common or correct in Spanish. The types of influenced grammatical utterances previously observed were not observed in large numbers in the current study. The types of influenced ungrammatical utterances reported in previous studies were observed in the current study, particularly in the area of word order and omitted subjects and objects. Therefore, it appears that in the area of grammaticality, using influenced utterances does not help the child to become more grammatical, at least in the short term.

One caution to consider when evaluating grammaticality of these young bilingual children is that even though some children produce more grammatical utterances, the percent of grammatical utterances produced is still low (see Table 6). Also, as children get older, the initial apparent advantage in grammaticality does not continue for children who speak more English (Gathercole, 2002a; 2002b). Instead, children perform similarly. Therefore, it is important not to quickly infer that children should use a second language, in this case English early on when the language models they receive would be better in their first language, in this case Spanish.

Clinical Implications

Clinically, this information informs us about the relationship of English use at home and English use at school with mother SES. When working with children who are in the process of learning English, it is important to take into account the amount of

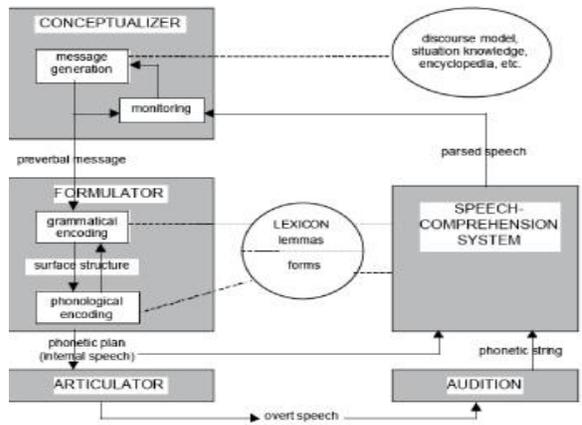
English they are speaking not only at home, but also the amount of English they are speaking at school. These factors can aid a clinician in what to expect in the performance of a child with typically developing language. For example, if the parents report that the child speaks English approximately 60% of the time at home and uses English 30% of the time at school, a clinician would expect for the child to produce influenced utterances in the context of narratives and have fewer grammatical sentences than a child who speaks English most of the time at home and whose mother has a higher SES. The clinician could also expect the child to produce few influenced utterances and most of the influenced utterances produced would be expected to be ungrammatical. It is again important to take into consideration the grammaticality percentages of bilingual children (see Table 6).

Grammaticality of Spanish-English bilingual children learning English appears to be relatively low for the most part, but it is important to take the different amounts of experience with English into consideration. Children who spoke less English did not produce more ungrammatical utterances at pre-test or post-test (see Table 8 and Table 9) than children who spoke more English. Instead a child who has less experience with English may produce fewer utterances and have a lower percentage of grammatical utterances than one might expect from a monolingual speaker of English. Therefore, a child who is producing a low percentage of grammatical utterances may or may not be a concern for a clinician depending on how often the child speaks English at home and at school.

Future Studies

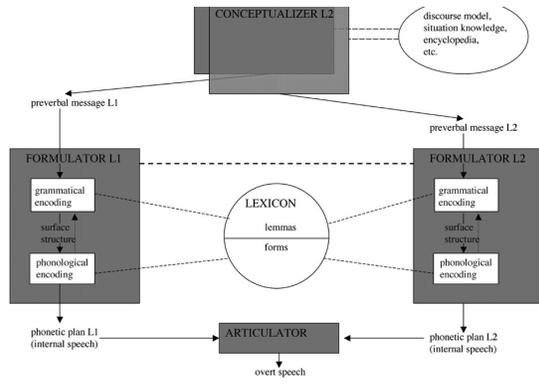
Information about the complexity of utterances may help explain observed differences in performance. Experience does appear to have a role in the grammaticality and use of influenced utterances for children with typically developing language; it is unclear if similar patterns would be found in children with language impairment. Determining the role of experience would aid in determining if children with language impairment present with differences in performance based on experience with their second language, or if there are factors other than experience contributing to the difficulty with language development. Relatively speaking, bilingual children with typically developing language who have more experience with English may continue to present with a low percentage of grammatical utterances. Therefore, the production of ungrammatical utterances produced by a bilingual child may or may not be the result of limited language experience. Rather future studies are needed to document the use of ungrammatical and influenced utterances used by bilingual children with language impairment in their second language. Taking the amount of English spoken at home and the amount of English spoken at school along with mother SES into consideration can provide both researchers and clinicians with expected performance of bilingual children during narrative tasks.

Figure 1 - Levelt's Blueprint of the Speaker



Taken from <https://calico.org/html/T9gY9k0.jpg>

Figure 2 - Bilingual Adaptation of Levelt's Blueprint of the Speaker



From Hartsuiker & Pickering (2007) from DeBot (1992)

Figure 3 - English Output Home Frequency Chart

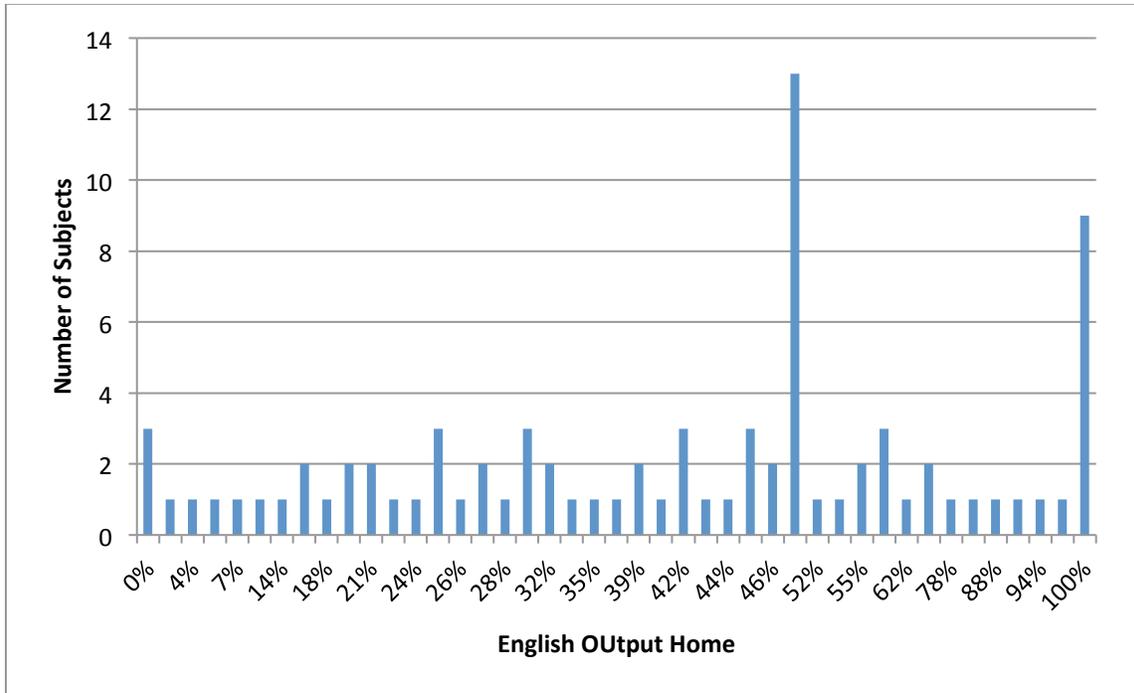


Figure 4 - English Output School Frequency Chart

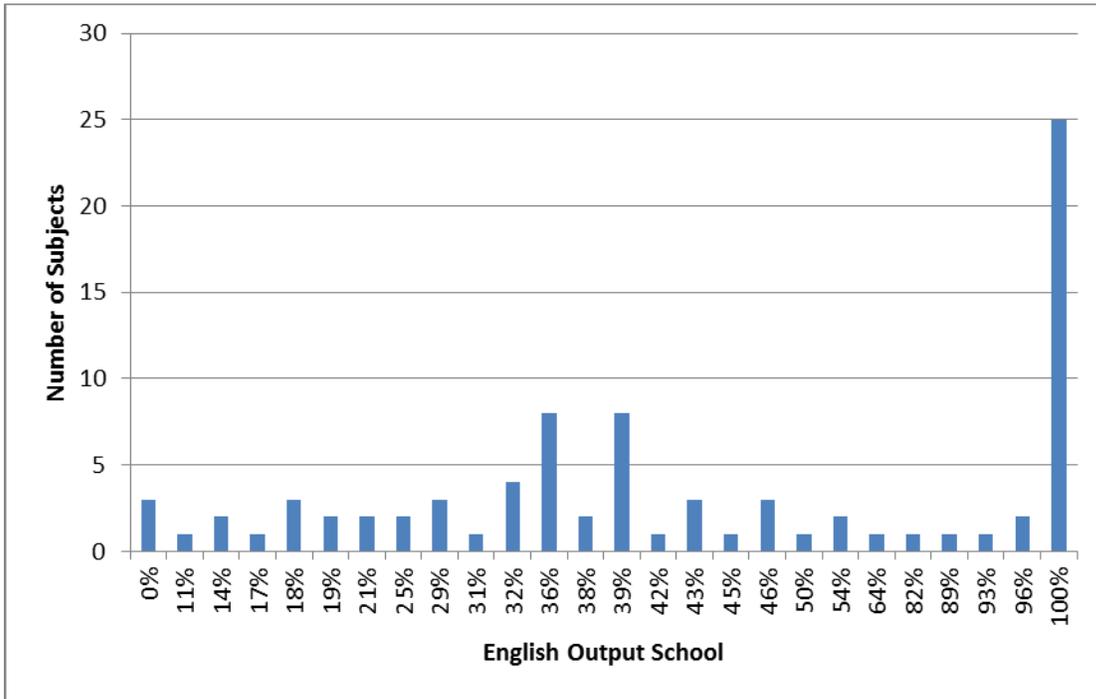


Figure 5 - Mother SES Frequency Chart

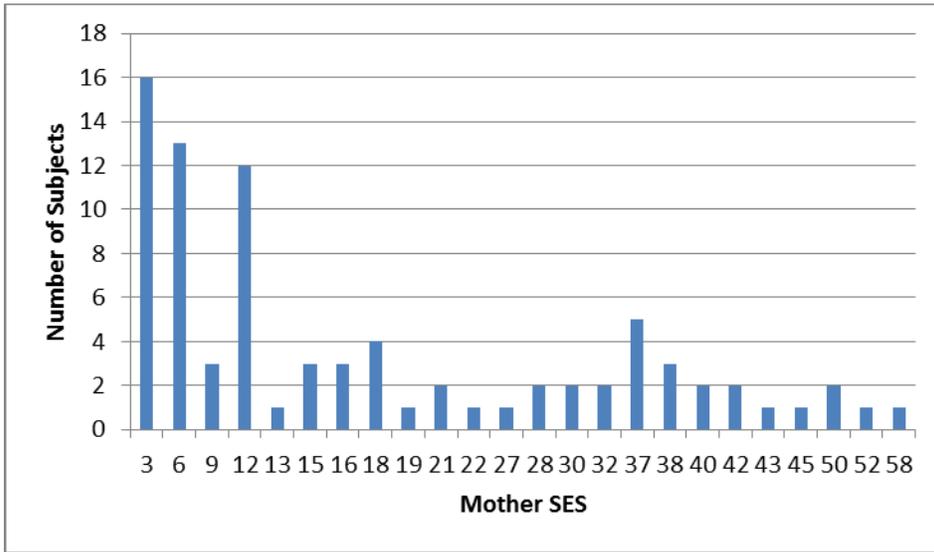
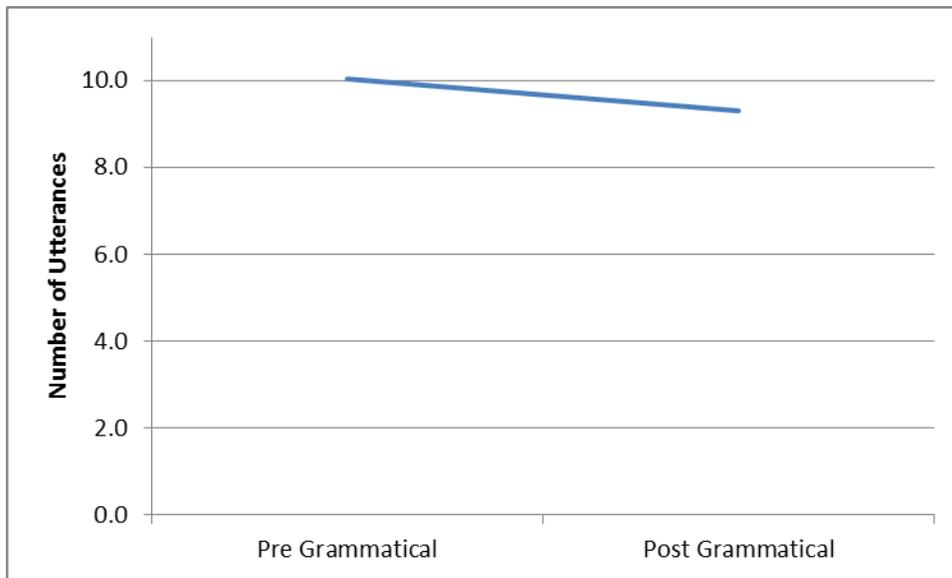
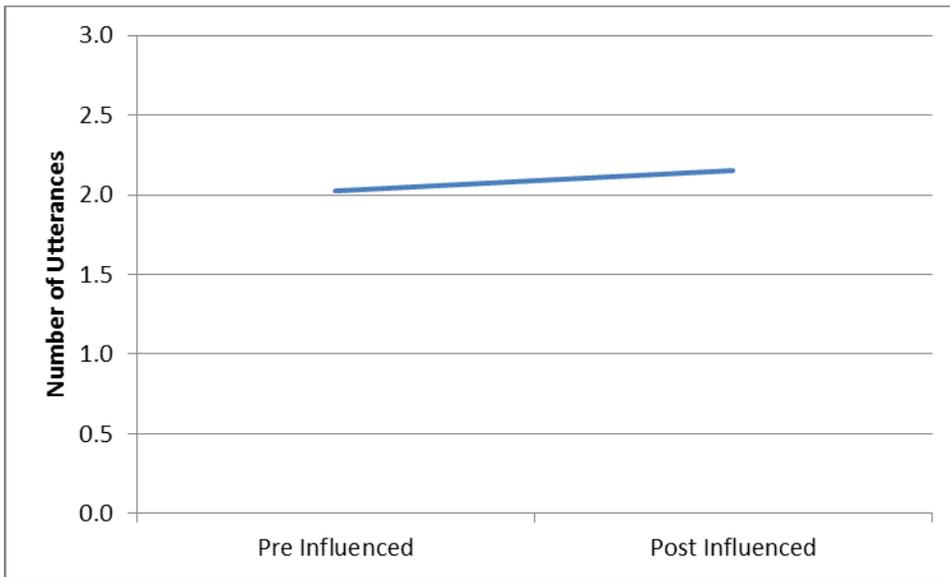


Figure 6 - Changes from Pre-Test to Post-Test for Number of Grammatical Utterances



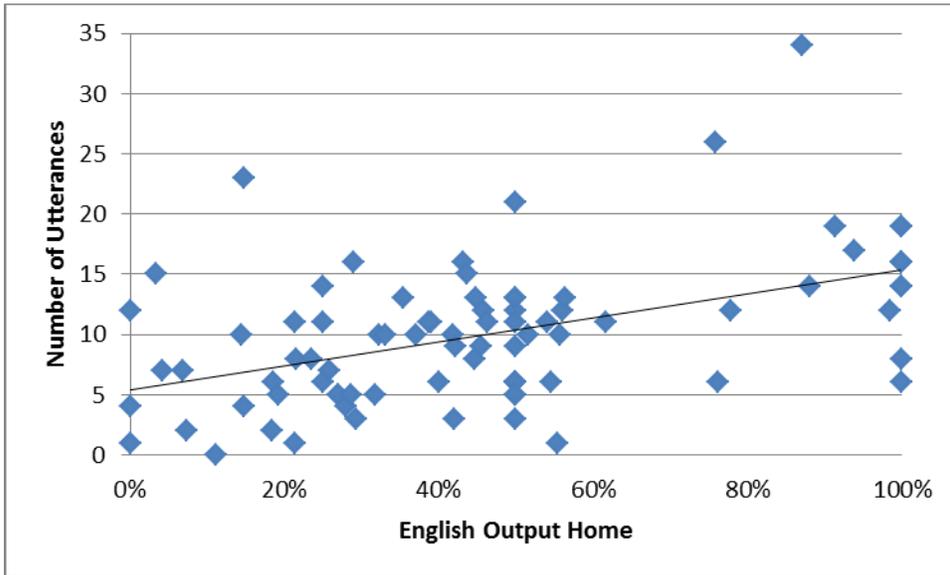
p = 0.199

Figure 7 - Changes from Pre-Test to Post-Test for Number of Influenced Utterances



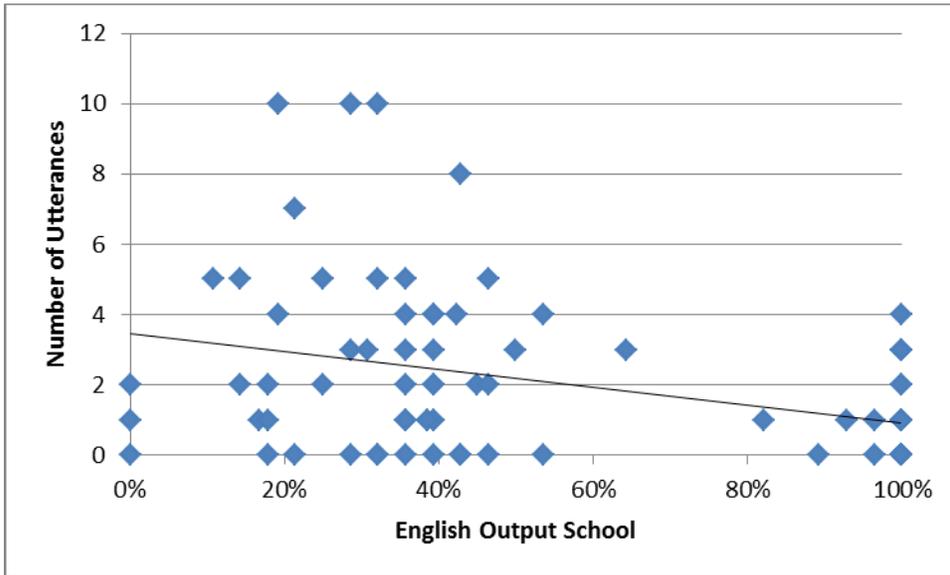
$p = .407$

Figure 8 - Grammatical Utterances at Pre-Test



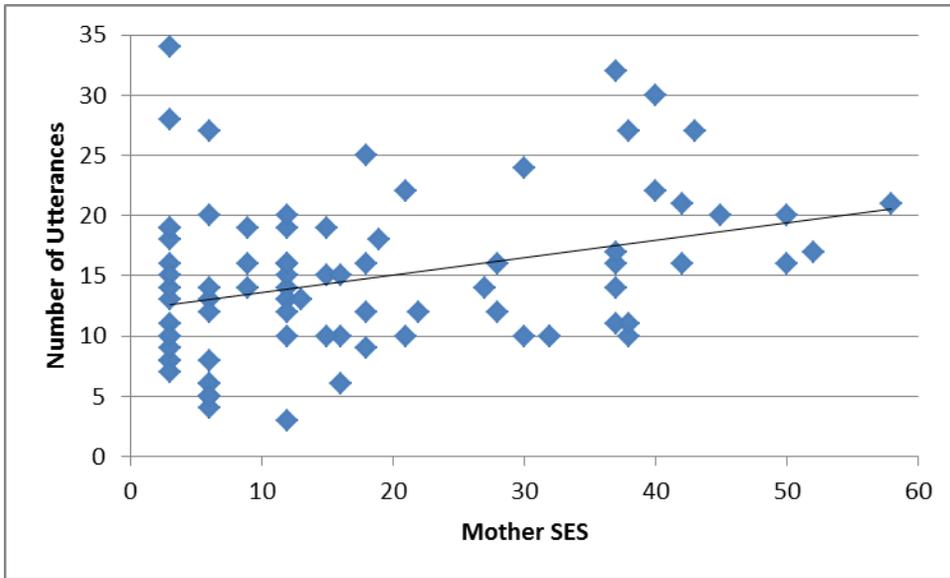
p = .025

Figure 9 - Influenced Utterances at Pre-Test



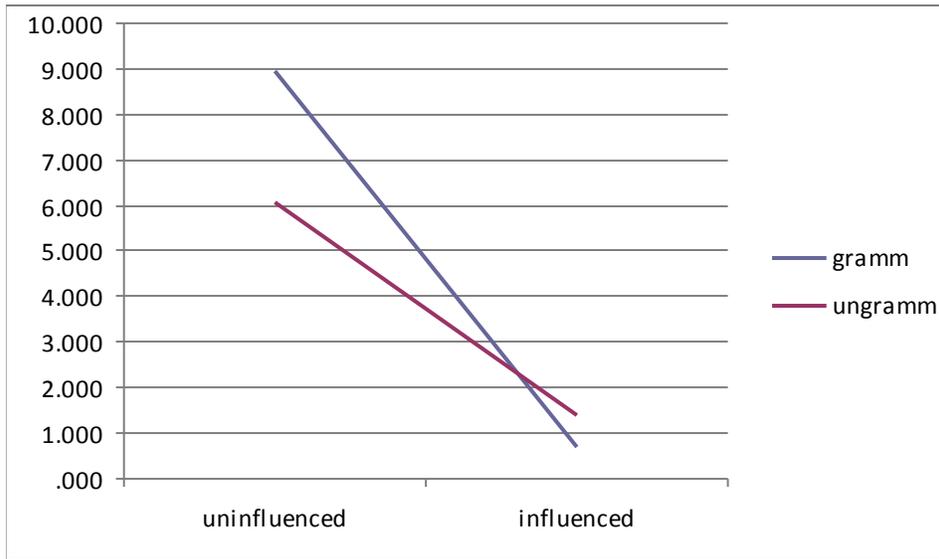
p = .01

Figure 10 - Uninfluenced Utterances at Post-Test



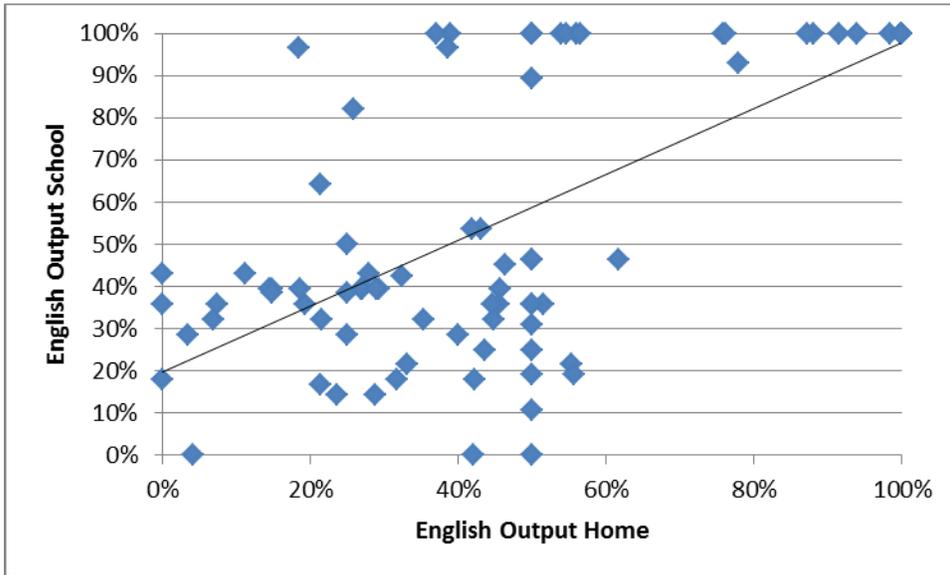
P = .05

Figure 11 - Grammaticality x Influence Interaction



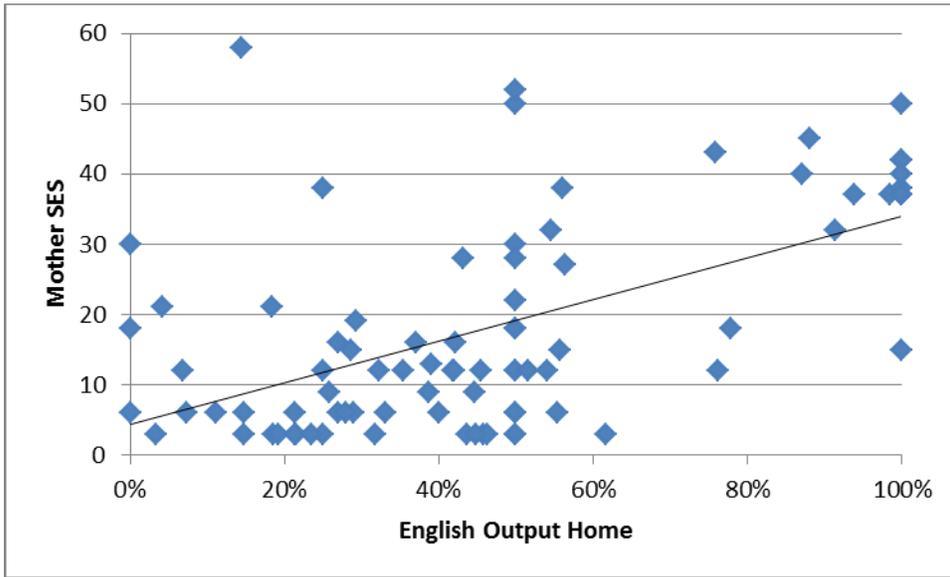
$p < .001$

Figure 12 - English Output Home and English Output School



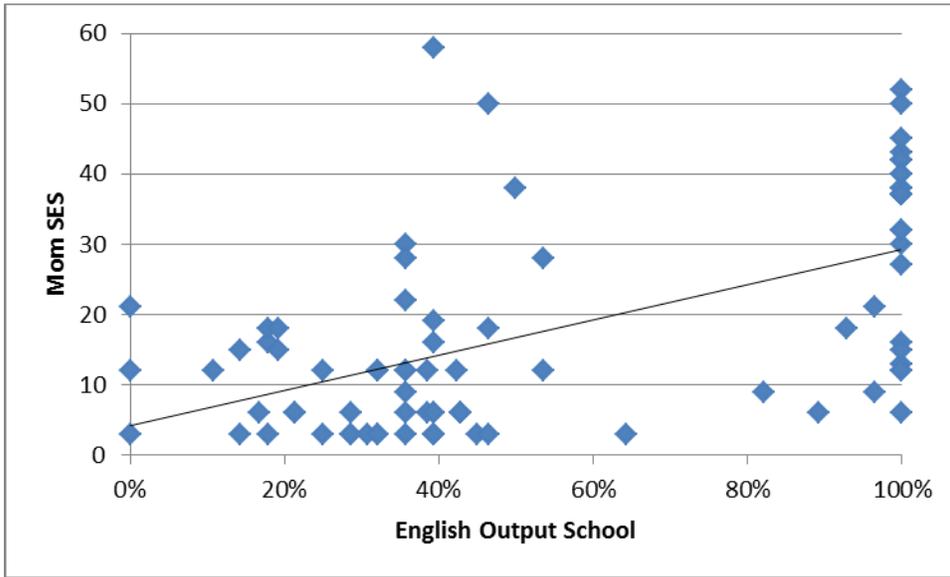
p = .01

Figure 13 - Mother SES and English Output Home



p = .01

Figure 14 - English Output School and Mother SES



p = .01

Table 1 - Number of Participants

<u>Gender</u>	<u>Diagnostic Markers</u>	<u>Additional</u>	<u>Total</u>
Male	31	7	38
Female	34	12	46
Total	65	19	84

Table 2- Participant Characteristics

	Mean	Standard Deviation	High	Low
Age	5;11	4.5 months	6;7	5;2
English Output Home	46%	28%	100%	0%
English Output School	56%	34%	100%	0%
Mother SES	18	15	58	3
UNIT Scores	102	10	120	82
BESA English Morphosyntax Scores	35	17	61	2
BESA English Semantics Scores	27	7	42	12
BESA Spanish Morphosyntax Scores*	46	13	72	13
BESA Spanish Semantics Scores*	27	5	42	13
BESA Total Score (Best Language Syntax + Best Language Semantics)	82	14	114	45

*Only subjects with 20% or greater output in Spanish completed the BESA Spanish Morphosyntax and Semantics subtests.

Table 3 - Categories of Utterances Produced

	Grammatical	Ungrammatical
Uninfluenced	Ex: The dog and the cat were talking.	Ex: Then he went off the water.
Influenced	Ex: The dog was watching the tail of the cat.	Ex: You know who stole my ring?

Table 4 - Types of Influenced Utterances from Kormos (2006)

Type of Influence	Example	Explanation
Lexical Influence	The perro [dog] was running.	Word from Spanish
Morpheme Use	The dog kickó the cat.	Past tense morpheme <i>ó</i> from Spanish
Word Order	The lizard green was mad.	Word order from Spanish
Direct Translation	You know who stole the ring?	Direct translation of Spanish utterance ¿Tú sabes quien robó el anillo?

Table 5 - Pre-Test Post-Test Changes

Variable	F(1,83)	p	η_p^2
Time	0.338	0.563	0.004
Grammaticality	6.901	0.010**	0.077
Influence	328.10	<0.001**	0.798
Time x Grammaticality	1.680	0.199	0.020
Time x Influence	0.694	0.407	0.008
Grammaticality x Influence	20.195	<0.001**	0.196
Time x Grammaticality x Influence	0.035	0.851	0.000

Note N=84

**p \leq .01

Table 6 - Grammatically Measures

		Raw Number				Percentage			
		Mean	SD	High	Low	Mean	SD	High	Low
Pre-Test	Grammatical Utterances	10.0	5.9	34	0	56%	24%	100%	0%
	Ungrammatical Utterances	7.3	4.8	25	0	41%	23%	100%	0%
	Influenced Utterances	2.0	2.4	10	0	12%	14%	56%	0%
	Uninfluenced Utterances	15.3	6.5	38	1	86%	17%	100%	6%
	Total Utterances	17.8	6.2	42	7				
Post-Test	Grammatical Utterances	9.3	6.3	28	0	52%	24%	93%	0%
	Ungrammatical Utterances	7.6	4.5	28	1	47%	23%	100%	7%
	Influenced Utterances	2.2	2.5	14	0	13%	15%	78%	0%
	Uninfluenced Utterances	14.8	6.6	34	3	86%	16%	100%	38%
	Total Utterances	17.1	6.7	41	6				
Change	Grammatical Utterances	-0.7	5.3	14	-22	-4%	2%	62%	-43%
	Ungrammatical Utterances	0.4	4.2	11	-14	6%	2%	61%	-41%
	Influenced Utterances	0.1	2.5	6	-6	2%	14%	53%	-33%
	Uninfluenced Utterances	-0.5	5.9	21	-13	0%	17%	94%	-48%

Table 7 - Correlation of Predictor Variables

	English Output Home	English Output School	Mother SES
English Output Home	---	.654**	.560**
English Output School	.654**	---	.568**
Mother SES	.560**	.568**	---

**p = .01

Table 8 - Pre-Test Predictors of Grammaticality and Influence

Dependent Variable	Independent Variables	Unstandardized B	Standard Error	Standardized B
Grammatical	F(3,83)=10.038	R=0.523	Adj. R²=0.246	
Utterances	English Output Home	6.275	2.748	0.302*
	English Output School	1.742	2.319	0.100
	Mother SES	0.080	0.048	0.203
Ungrammatical	F(3,83)=3.485	R=0.340	Adj. R²=0.116	
Utterances	English Output Home	-2.771	2.443	-0.165
	English Output School	-1.645	2.061	-0.117
	Mother SES	-0.036	0.043	-0.114
Influenced	F(3,83)=4.146	R=0.367	Adj. R²=0.102	
Utterances	English Output Home	-0.254	1.214	-0.030
	English Output School	-2.710	1.024	-0.384**
	Mother SES	0.012	0.021	0.073
Uninfluenced	F(3,83)=3.292	R=0.331	Adj. R²=0.077	
Utterances	English Output Home	3.759	3.371	0.163
	English Output School	2.808	2.844	0.145
	Mother SES	0.032	0.059	0.074

Note: N=84

* $p \leq .05$. ** $p \leq .01$.

Table 9 – Post-Test Predictors of Grammaticality and Influence

Dependent Variable	Independent Variables	Unstandardized B	Standard Error	Standardized B
Grammatical	F(3,83)=7.558	R=0.470	Adj. R²=0.192	
Utterances	English Output Home	1.903	3.052	0.085
	English Output School	4.33	2.575	0.232
	Mother SES	0.096	0.053	0.228
Ungrammatical	F(3,83)=4.270	R=0.372	Adj. R²=0.106	
Utterances	English Output Home	-3.687	2.267	-0.234
	English Output School	-2.669	1.912	-0.202
	Mother SES	0.013	0.040	0.044
Influenced	F(3,83)=1.849	R=0.255	Adj. R²=0.030	
Utterances	English Output Home	0.036	1.346	0.004
	English Output School	-1.720	1.136	-0.229
	Mother SES	-0.008	0.023	-0.046
Uninfluenced	F(3,83)=3.605	R=0.345	Adj. R²=0.086	
Utterances	English Output Home	-1.820	3.376	-0.078
	English Output School	3.384	2.848	0.174
	Mother SES	0.117	0.059	0.267*

Note: N=84

* $p \leq .05$. ** $p \leq .01$.

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