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Development of 14 English grammatical morphemes in Spanish–English preschoolers

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Abstract

Previous research in the USA studying Spanish–English bilingual children's language development has largely focused on children's developing abilities in Spanish. However, relatively little research has been conducted on children's English grammatical development. Therefore, the purpose of this study was to examine the English grammatical development of bilingual (Spanish–English) Head Start children during the preschool years. The goals were to determine (a) whether there are differences in children's productions of English grammatical morphemes based on timing of English exposure and (b) which morphological structures met mastery, emerging and early emerging levels of production by bilingual children. These aims were accomplished through in-depth analyses of spontaneous language samples collected over a two-year period in Head Start. Comparisons were made between Spanish-speaking children who were exposed to English at home from birth (home English communication (HEC)) and Spanish-speaking children who were not expected to communicate in English until their entry into Head Start (school English communication (SEC)). Results indicated that children in the HEC group mastered more morphemes earlier than the children in the SEC group; however, by the end of children's second year in Head Start both groups had mastered a similar number of morphemes. Additionally, the children in both groups differed in which morphemes were mastered at the end of Head Start when compared to monolingual English-speaking children. The results of this investigation provide information to clinicians about typical English grammatical development of Spanish–English preschool children.

Keywords

morphology; language acquisition; bilingualism; Spanish–English

Introduction

Approximately 20% of the school-age population speaks a language other than English in the home (Motel, 2012). Slightly over half (52.8%) of the school-age children who speak a language other than English at home speak Spanish as their home language (U.S. Census Bureau, 2012). Thus, today's educational programs serve a large percentage of children who

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are primarily Spanish speaking or who are bilingual. In addition, approximately 60% of speech-language pathologists (SLPs) currently provide speech and language services to children identified as having a home language other than English, with an average of seven students per SLP (American Speech-Language-Hearing Association, 2010). Therefore, further information about bilingual children's language development is needed in order for SLPs to accurately identify productions that mark both typical and atypical development of children's language. This is particularly challenging, given both the variability in the morphemes being acquired at one time and the variation in children's language development due to differences in language exposure.

Individual differences in bilingual development

It is important to consider the heterogeneity within bilingual children and that differences in the timing of second language exposure will most likely affect development in different ways. Butler and Hakuta (2004) and others (Genesee, 2004; Oller & Eilers, 2002) argued that the manner in which to truly capture bilingual language acquisition is through the examination of two factors: (a) age of language acquisition and (b) introduction to formal educational instruction. Butler and Hakuta (2004) suggested that second language proficiency varies by age of acquisition and that observed differences in second language acquisition among bilingual children may be the result of the degree of formal instruction in the second language; thus, the timing of school entry is considered to be a key variable. Additionally, the degree to which the second language is used in the home environment may also influence second language proficiency. Consequently, differences in English syntactic development may occur between children who communicate in Spanish at home prior to school entry and are first expected to communicate in English when they begin school as opposed to children are exposed to both languages in the home before attending school.

More specifically, the expectation of English communication upon entry into Head Start is a key variable in this investigation due to the fact that instruction provided in English appears to have the most direct effect on English language abilities (Butler & Hakuta, 2004; Genesee, Paradis, & Crago, 2004). Additionally, others (Bialystok, 2001; Romaine, 1997) have suggested that the timing of children's exposure to Spanish and English language input is an important variable to be considered in the development of bilingual children because it may lead to varied oral language experiences. The underlying assumptions of a usage-based theory of language acquisition (Tomasello, 2003) may assist in the understanding of morphological development in bilingual children due to its main postulation that children's development is directly influenced by exposure to and experience with language.

Usage-based theory of language acquisition

Under the assumptions of a usage-based theory of language acquisition (Tomasello, 2003), the role of language input appears to have important implications for children's morphological language development. Children learn to use grammar by observing events within their environment and by attempting to understand others' communicative intentions regarding these observed events. According to a usage-based approach, children's acquisition of syntactic constructions occurs gradually and is dependent upon lexical development. Furthermore, syntactic constructions are acquired based on the exposure to particular constructions observed in the linguistic environment. Therefore, a possible influence of language input upon bilingual children's morphological abilities is the timing of exposure to the second language (Butler & Hakuta, 2004; Paradis, Genesee, & Crago, 2011). Tomasello (2003) suggested that the language environment provides the foundation on which children construct their linguistic inventories. Furthermore, children's exposure to various linguistic constructions results in differences in their language development. For learners of two languages, Romaine (1997) argued that the amount of input in each language

and age of second language acquisition is critical for children's second language development. Therefore, it is important to recognize the potential influence the language environment and the timing of language exposure has upon children's second language acquisition. Differences between monolingual and bilingual children's linguistic experiences may result in differences in their morphological development.

Because of the potential influence the language environment has upon children's second language acquisition, children in this study were classified as either home English communication (HEC) or school English communication (SEC) language learners. Learners of two first languages, English and Spanish, were considered as HEC language learners. These children had exposure to two languages from birth. Children in Spanish-speaking homes, who were not expected to communicate in English until entrance into Head Start at 3 years of age, were considered SEC language learners.

Previous studies of bilingual children's morphological development have yielded differences in the findings (Bland-Stewart & Fitzgerald, 2001; Dale, 1980; Dulay & Burt, 1973, 1974). These differences may be due to lack of consideration of timing of exposure to English under a usage-based theory of language acquisition. Therefore, this study aims to expand previous research on bilingual children's morphological development based on timing of exposure to English.

Bilingual children's English grammatical development

Previous research has found that bilingual children's order of acquisition of English grammatical morphemes is parallel to monolinguals (Dale, 1980; Dulay & Burt, 1973, 1974). However, Dale (1980) indicated that the bilingual group exhibited a lower percent of accuracy across all morphemes when compared to the monolingual expectations. Similarly, Dulay and Burt (1973, 1974) indicated that the errors observed in bilingual children's productions were related to the nature of development. Importantly, these studies did not examine the grammatical development of bilingual children during the preschool years during which the emergence of grammatical forms is most evident (Brown, 1973).

Additionally, bilingual children's rate of acquisition of English morphosyntax, as measured by mean length of utterance (MLU), was found to be within the normal or expected range of monolingual children. More specifically, French–English (Paradis & Genesee, 1996) and Spanish–English (Padilla & Liebman, 1975) children's MLU has been found to be similar to Miller's (1981) monolingual MLU range, albeit the bilingual children's MLU was within the lower bound. In contrast, Bland-Stewart and Fitzgerald (2001) indicated that the pattern of use of the 14 grammatical morphemes by MLU level in Spanish–English children between 2 and 5 years was quite variable. However, all children demonstrated emergent use of most morphological inflections. Additionally, they found that morphemes meeting mastery did not follow a pattern of development similar to monolinguals. Further analysis may have confirmed that these errors were developmental in nature. It is also important to recognize that the children in this study were identified from various Spanish-speaking backgrounds and that no information as to children's length of exposure to English was provided.Paradis et al. (2011) argue that some differences in morphology might appear as errors in English as the second language, which is caused by the transfer of the grammatical rules from the child's first language. But for the majority of instances, these differences or errors are developmental in nature. In other words, these differences would be the same for all learners of English and parallel to the developmental stages of English monolingual children.

Additional research is needed to further examine the patterns of English grammatical development in bilingual children, as there are several gaps in previous research. First, several studies investigated the development of morphology in school-age children. It is

important to also examine morphological productions in preschool children, where the emergence of such productions would be expected, in order to understand the early stages of development. Second, previous research investigating Spanish–English children yields small sample sizes, making it difficult to generalize to other bilingual children. Third, previous studies do not provide information about children's timing to exposure to English or the children's experiences with English under a usage-based theory of language acquisition. Recent research underscores that observed variances in bilingual children's development is likely due to the timing and length of exposure to a second language (Bialystok, 2001; Paradis, Genesee, & Crago, 2011). Lastly, several key investigations were cross-sectional. More in-depth analyses of spontaneous language samples collected longitudinally can provide a stronger foundation in which to examine the English grammatical development of bilingual children.

Rationale and research questions

For SLPs to provide the most appropriate services to this population, more information is needed about children's morphological development over time. Production of Brown's (1973) 14 grammatical morphemes is a common measure of children's understanding and use of language in speech-language pathology assessments and interventions. Therefore, an understanding of the development of these 14 grammatical morphemes in bilingual children who differed in regard to their exposure to English will provide professionals with adequate information that they can use when assessing bilingual children's morphological productions.

To meet the critical need for information on bilingual children's English language development, this study investigated the grammatical development of bilingual children from the ages of 3 to 5 years during two years in Head Start. The first research aim was to determine whether there are differences between HEC and SEC language learners in regard to their production of English grammatical morphemes. Previous research has indicated that there are differences in the language development of Spanish–English bilingual children who were exposed to a second language from birth when compared to those who were exposed to a second language once formal schooling had begun (Hammer, Lawrence, & Miccio, 2007, 2008; Hammer, Miccio, & Wagstaff, 2003). It was hypothesized that differences in the production of English grammatical morphemes would be observed between the two bilingual groups.

The second research aim was to determine which morphological structures met mastery, emerging and early emerging levels of production by bilingual children. Based on the work of Bland-Stewart and Fitzgerald (2001), it was hypothesized that the English morphological structures produced by bilingual children will follow a different developmental pattern when compared to morpheme production of typically developing monolingual English children as outlined by Brown (1973).

Method

Participants

The participants included 81 preschool-aged bilingual children who took part in a longitudinal study of bilingual preschoolers. Participants were recruited from two Head Start programs – federally funded preschool programs for children from low-socioeconomic backgrounds – with a large percentage of bilingual children located in two different contiguous counties in Central Pennsylvania. The primary language of instruction in Head Start was English. Both English immersion Head Start programs were located in diverse communities. One program included 54% of the children being identified as Latino, while

the second program reported 23% of the children as being identified as Latino. All children in both communities were from families from low-socioeconomic backgrounds. It is possible that children were exposed to nonmainstream dialects of English although the dialects were not studied systematically.

Children were divided into two groups at the beginning of the study based on information provided from children's mothers during a home visit. A background questionnaire and home language questionnaire was administered in the language of the mothers' choice (Spanish or English) by trained home visitors. Mothers were asked to report the ages at which their children were spoken to and expected to communicate in English. All children were exposed to Spanish from birth, but differed in when they were exposed to English. Children who learned both languages, English and Spanish, from birth and prior to school entry were classified as having HEC (n = 48; males = 22, females = 26). Children who were exposed to Spanish from birth but were not expected to communicate in English until they entered Head Start at age three were classified as having SEC (n = 33; males = 10, females = 23). Although children in this group were not expected to communicate in English until they entered Head Start, it is possible that the children may have had incidental exposure to English in the community (Hammer, Lawrence, & Miccio, 2007, Kohnert, Bates, & Hernandez, 1999). Differences observed in language outcomes of bilingual children based on the timing of English immersion have been supported in previous research (Hammer, Lawrence, & Miccio, 2007, 2008).

All participants were typically developing, passed a hearing screening administered by a Head Start nurse, were of Puerto Rican descent, lived in a family who financially qualified for Head Start services, and attended the preschool program for two years. In order to be considered typically developing, the participants (a) had no parental or teacher concerns about their development; (b) had no history of developmental, neurological or physiological deficits per parent and teacher report; and (c) had passed the *Denver Developmental Screening Test-II* (Frankenburg, Dodds, Shapiro, & Bresnick, 1992) administered by the participants' classroom teachers.

Child and mother characteristics are shown in Table I. A larger percentage of children in the SEC group were born in Puerto Rico when compared to children in the HEC group. Nearly all of the mothers of the children in the SEC group were born in Puerto Rico as opposed to approximately half of the mothers of the children in the HEC group. Differences between the two groups of mothers were not observed with regard to educational level or employment status. The mothers in both groups averaged less than a high school diploma.

Procedures

English and Spanish language samples were collected in the fall and spring of the children's two years in Head Start. Trained data collectors elicited spontaneous, conversational language samples in English and Spanish from the children during two 25-min free-play sessions. Data collectors were trained to ask open-ended questions and comments, such as "Tell me more". The purpose was to collect a natural sample; therefore, the elicitation of specific morphemes was not in the language sample protocol. During one play session, the children interacted with an adult who spoke only English to them. A second play session included a bilingual adult who spoke only Spanish to the children. The order of the play sessions was counterbalanced. During each play session, children engaged in a symbolic play activity and were given access to two stuffed animals, kitchen and bath time play sets and a doctor's kit. This investigation focused upon children's English language development.

Language samples from the first two years of Head Start were fully transcribed according to Systematic Analysis of Language Transcripts (Miller & Chapman, 2002) conventions. The types and frequency of Brown's (1973) 14 grammatical morphemes were determined and codes (see Table II) were developed to document children's correct and incorrect productions of the following morphemes: present progressive *–ing*, prepositions *in* and *on*, plural *–s*, regular and irregular past tense, possessive *–s*, forms of copular and auxiliary *be*, articles *a* and *the* and regular and irregular third person singular.

Speech-language pathology undergraduate and graduate research assistants were trained to code grammatical morphemes using a subset of transcripts. The research assistants achieved 90% accuracy or higher on three transcripts before they began coding the research transcript samples. Utterances were separated by t-units as outlined by Paul (2001) and then coded. Based upon Miller (1981), this study included language samples with 50 or more complete and intelligible utterances. Language samples that included fewer than 20% of utterances in English or less than 50 complete and intelligible English utterances were excluded from analysis. The number and percentage of the children included in the final analysis set when excluding those children who produced less than 20% English utterances and less than 50 utterances are displayed in Table III. It should be noted that relatively few transcripts were excluded based on these criterion across the two years in Head Start. However, attrition across both groups of children was observed. Missing participants in longitudinal data is a common phenomenon. Although missing data increased over each measurement occasion, with the highest proportion of missing data at the last measurement occasion for children in both HEC and SEC, we assumed the missing data were missing at random (Arbuckle, 1996; Wothke, 2000).

The proportion of contexts in which the children accurately produced the targeted grammatical morphemes was calculated using data from the first 50 complete and intelligible utterances. For each bound morpheme, the proportion correct was derived by taking the number of accurate productions and dividing that number by the total number of obligatory contexts. The targeted morphemes that were acquired, emerging and early emerging were determined. Acquisition was defined as 90% accuracy or higher in all obligatory contexts, emergence was defined as 50–89% accuracy (Miller, 1981), and early emerging was defined as 10–49% accuracy (Paul, 2001).

Due to the nature of spontaneous language samples, it was assumed that each child would use the target morphemes at different frequencies (Lahey, Liebergott, Chesnlck, Menyuk, & Adams, 1992). For this reason, the number of obligatory contexts was used as the denominator when determining the percentage of accuracy scores. This method reduces the penalization and exclusion of a child due to few productions. If a child's language transcript did not contain a minimum of three obligatory contexts for a certain target morpheme, a percentage for the use of that morpheme was not calculated (de Villiers & de Villiers, 1972; Khan & James, 1980; Miller, 1981).

Once coding of the research transcripts began, reliability estimates were calculated based on 25% of the samples being re-coded for the frequency and type of Brown's (1973) 14 grammatical morphemes. Point-by-point inter-rater reliability checks were conducted with all discrepancies being resolved by consensus. Reliability was determined to be at 94%.

Results

Differences between HEC and SEC language learners

In order to address the first research aim, in-depth, descriptive analyses were conducted to determine the differences in English morphological production between HEC and SEC

language learners. The prepositions *in* and *on* were collapsed into one morpheme, similar to the articles a and the. Thus, a total of 13 morphemes are discussed in following section and in Tables IV–VII.

During the fall and spring of their first year in Head Start, the children in the HEC group mastered more morphemes than children in the SEC group. However, by the end of Head Start, children in the SEC group mastered a similar number of morphemes as compared to children in the HEC group. Similar abilities were observed in children's performance of contractible copula, prepositions and third person singular forms. A larger proportion of children in the HEC group were observed to reach mastery for plural *–s*, irregular past tense and present progressive *–ing* in the first year, with children in the SEC group reaching similar levels by the end of Head Start. Much variation was observed with regard to the possessive forms for both groups of children and children in the SEC group demonstrated variation in their levels of accuracy with regard to contractible auxiliary and past *–ed*. These differences were observed in both the in-depth analysis completed on each morpheme and for those morphological structures meeting mastery.

Morphological structures meeting mastery

In-depth, descriptive analyses were also included to address the second research aim, which was to determine the English morphemes mastered by two groups of bilingual children. The percentage of children in each bilingual group that met mastery during the spring of children's second year of Head Start were ordered with the largest percentage meeting mastery listed first. The list of children's mastery of English grammatical morphemes is displayed in Table VII. Nearly all of the children in the HEC group mastered prepositions, articles and present progressive forms early. Approximately, three-fourths of the children in the HEC group mastered regular past *–ed*, uncontractible auxiliary, plural *–s* and possessives. These morphological forms were followed by mastery of irregular past tense, contractible auxiliary, contractible copula and third person singular. Irregular third person singular forms were not mastered by any of the children in the HEC group by the end of their second year in Head Start.

Nearly all of children in the SEC group mastered prepositions and irregular past tense. Approximately three-fourths of the children mastered plural *–s*, articles and present progressive. Half or more mastered past *–ed*, contractible auxiliary, contractible copula and possessives. Following these morphological forms, children in the SEC group mastered irregular third person singular and third person singular. Uncontractible auxiliary forms were not mastered by any of the children in the SEC group in the spring of their second year in Head Start.

Some similarities between the two groups of children were observed with regard to the mastery of English morphological forms. Specifically, for both groups of children preposition and article forms were mastered early in development, whereas uncontractible copula, regular third person singular and irregular third person singular forms were found to be later developing in both groups of children.

In contrast, some differences between the two groups were observed as well. By the end of children's second year in Head Start, a larger percentage of children in the SEC group mastered irregular past tense, uncontractible copula and irregular third person singular forms when compared to children in the HEC group. In addition, children in the HEC group appeared to master the bound morphemes, present progressive *–ing*, past *–ed*, possessives and uncontractible auxiliary earlier than children in the SEC group. Moreover, variable periods of present and absent obligatory contexts for each of the grammatical morphemes were observed within each bilingual group. Thus, a relatively small number of children

produced some morphological structures, such as irregular third person singular and possessives, which may have differentially impacted the percent reaching mastery of English grammatical morphemes of bilingual children. It should be noted, however, that similar to typical monolingual language acquisition, there is overlap between the emergence and mastery of each morpheme for this bilingual population.

Discussion

Based upon the usage-based theory of language development (Tomasello, 2003), children acquire language through exposure to the linguistic environment, which influences the grammatical structures children produce. The timing of language exposure and the language environment provides the foundation in which children base their own unique combinations and productions (Tomasello, 2003). Previous research has suggested that the expectation of English communication upon entry into formal education is of particular importance due to the fact that direct instruction provided in English appears to have the most direct effect on English language abilities (Butler & Hakuta, 2004; Genesee, Paradis, & Crago, 2004). Thus, differences observed between bilingual children's syntactic abilities may be indicative of the timing of exposure to the second language (Butler & Hakuta, 2004). This study is descriptive in nature and, therefore, conclusions about the development of bilingual children's abilities should not be considered as a representation of all children learning English as a second language.

Differences between bilingual groups

The results of this study support the first research hypothesis in that there are differences between HEC and SEC language learners with regard to their production of English grammatical morphemes. One marked difference between the two language groups was observed with regard to children's productions of irregular past tense and irregular third person singular. In the case of these two morphological features, a larger percentage of children in the HEC group mastered the two features in the fall of their first year in Head Start when compared to children in the SEC group. However, by the spring of children's second year in Head Start, a larger percentage of the children in the SEC group mastered irregular past tense and irregular third person when compared to children in the HEC group. There are two possible explanations. One explanation may be that children in the SEC group demonstrated increased productions of these particular morphemes due to the change in the language environment once they entered Head Start. Once entering Head Start, children were expected to communication in English as opposed to Spanish.

A second explanation as to why these differences were observed is the salience and the frequency with which the grammatical structures occur in each language (Bedore, 1999; Bedore & Peña, 2008). Grammatical forms that are common across the two languages may lead to a higher level of production, whereas forms that are unique to each language may be produced at a lesser rate or later in development. For children in the SEC group, irregular past tense and irregular third person may have been acquired earlier due to their salience in both languages. In addition, these forms may have been particularly salient given the English immersion environment of the classroom. Furthermore, the language environment of the classroom may have underscored the importance of communicating in English and the use of English grammatical structures. For children learning in both Spanish and English, such as children in the HEC group, these differences may not have been as pronounced since the English grammatical forms were heard across language learning environments at home and in Head Start.

These findings support the differentiation between bilingual groups since it is suggested that the timing of school entry impacts the nature of children's grammatical development. As

previous research has suggested, the timing of language exposure and specific context of the first and second languages influence the acquisition patterns of bilingual children's language development (Butler & Hakuta, 2004). Tomasello (2003) argued that the context of the learning environment influences children's development of language. In other words, children are learning from what they hear, and bilingual children are hearing different aspects of language, including syntactic markers, in different quantities. Therefore, home and school contexts that support differing languages are thought to influence children's abilities in different ways, thus supporting the hypothesis that differing the timing of language exposure will result in different developmental pathways.

Bedore and Peña (2008) also suggested that children in early stages of bilingual development are likely to have language abilities that fluctuate between emerging levels and acquisition due to context-specific language influences. Differing ages of exposure and context-specific language influences could also explain the finding that the bilingual groups differed in the mastery of English morphemes.

Morphological structures meeting mastery

Comparison to monolingual development—Consistent with the second research question and hypothesis, and with previous research on bilingual children's English grammatical abilities (Bland-Stewart & Fitzgerald, 2001), results revealed that children's English grammatical abilities during Head Start followed monolingual English development with the exception of two morphemes (see Table VIII).

In contrast to Brown's (1973) study, uncontractible copula was mastered later when compared to monolingual development. In addition, a smaller proportion of children in the HEC group mastered irregular past tense. However, a larger proportion of children in the SEC group were observed to master irregular past tense slightly earlier than monolingual English speakers. Opposite of this observation is the mastery of irregular third person singular by children in the HEC group slightly later than monolinguals, whereas children in the SEC group mastered this morpheme slightly earlier than either the HEC group or monolingual English speakers. As mentioned previously, this difference may be due to the timing of language exposure for each bilingual group. One difference between this sample of bilingual English language learners and monolingual children is the late emergence of possessive for children in both groups of bilingual language learners. Bedore and Peña (2008) suggested that differences in language-specific morpho-syntactic rules may yield differences in the mastery of specific grammatical structures. More recently, Bedore, Peña, Gillam, & Ho (2010) stated that bilingual children appear to learn features of English that are similar to Spanish first in development. It may be that Spanish–English children avoid more difficult or non-parallel constructions in English, such as possessives.

It is important to note that much variation was observed in children's productions of each morpheme across the 2-year period in Head Start and the mastery of morphemes was observed to overlap within each bilingual group. This is similar to the results of Brown (1973) in which the author stated that none of the grammatical morphemes in monolingual English speakers were acquired completely or suddenly. Instead, variable periods of present and absent obligatory contexts for each of the grammatical morphemes were observed. Bedore and Peña (2008) also suggested that the early language abilities of bilingual children will vary between emerging and mastery levels of performance.

In summary, there was variation in productions of English grammatical morphemes in Spanish–English children when compared to morphemes mastered by monolingual children. Additionally, differences were found between bilingual children who were first exposed to English once they entered schooling when compared to those who were exposed to both

languages from birth, thus, supporting the idea that there are instances in which knowledge in one language influences syntactic production in the other language. These findings suggest that bilingual children look to use their knowledge based on both of their languages to express syntactic complexity (Tomasello, 2003). It appears that children are basing their knowledge on the frequency and type of input from each language, and because there are differences in the type and frequency of input, differences are observed in children's productions (Tomasello, 2003). These differences may include the use of unexpected or unusual forms within either language when compared to monolingual norms. Such forms include using past progressive constructions instead of regular past tense. The differences in the language production of bilingual children are indicative of their degree of knowledge of each language and are not necessarily indicative of a deviance from typical language development. Bedore and Peña (2008) also suggested that not only will differences in the syntactic features of each language yield differences in morphemes mastered, but may also yield differences in the rate of development of grammatical structures.

Future directions

The results of this investigation support continued longitudinal examinations of bilingual children's language development in both English and Spanish in order to confirm the levels of productions in children's grammatical development. Future research is needed to investigate English and Spanish grammatical development in earlier stages of language development (i.e. before entering into preschool). This is particularly important given the results of this study in that both bilingual groups at the beginning of this investigation mastered some English morphemes. By examining grammatical structures beginning at an earlier stage of development, a better understanding of the acquisition and emergence of certain morphological features may be gained. Additionally, future studies need to be conducted to examine the grammatical development of bilingual children beyond preschool, because not all syntactic features were mastered during the preschool years. Information regarding the change from early stages of development to later stages will provide much more information on the rate of change in children's grammatical development.

In addition, due to the fact that a large percentage of children did not meet the minimum criterion of three obligatory contexts in order to calculate the percent of accuracy, the inclusion of an elicitation task in conjunction with spontaneous language samples may provide more detailed information on bilingual children's productions of English grammatical morphemes. An elicitation task will provide a child with the appropriate number of opportunities to produce the morpheme, therefore, increasing inclusion of children who may have been excluded from previous analyses. A percent accuracy could be calculated from the elicitation task and then further examined through in-depth descriptive analyses.

Studies that include children who attend preschools that provide instruction in Spanish are also needed to examine the impact on children's English grammatical development. Differences in the language of instruction may result in other differences in grammatical acquisition. Furthermore, Bedore and Peña (2008) asserted that across all domains of language, including grammatical development, differences would be observed based upon length and amount of exposure to each language as well as the context of exposure to each language. In addition, Hammer, Lawrence, and Miccio (2008) also asserted that based upon the results of their study, the amount of input of each language directly related to bilingual children's vocabulary outcomes. Further studies need to be conducted in order to address the role of language input, including home language, upon bilingual children's language outcomes. More specifically, studies that are able to formally measure the degree of

language proficiency, in both Spanish and English, and its impact on children's language development would be important to explore.

Such investigations will add to the understanding of language development of bilingual children living in communities in which bilingualism is not the norm and one of the languages spoken by the family is a minority language. In addition, future investigations will provide more information for professionals when assessing bilingual children and underscore the importance of understanding the language development of both Spanish and English in preschool children.

Clinical implications

There are several implications for professionals working with bilingual children from low-socioeconomic backgrounds based upon the findings of this study. It has been demonstrated that there is minimal information on the production of English grammatical morphemes in bilingual children based on when children were exposed to Spanish and English. The results of the present investigation provide such information for professionals when assessing English language development in bilingual children.

Often assessments are used in which the normative information is based upon monolingual development. However, developmental milestones of language cannot be assumed to follow the same pattern across languages (Bedore & Peña, 2008). In fact, the results of this study suggest that the assessment of English morphological productions of bilingual Spanish–English children may not provide an accurate description of children's abilities when based upon monolingual English norms. The same may be true for children's Spanish abilities. Based upon the results of this investigation, the English morphemes meeting mastery levels of production in bilingual children do not appear to follow the same expectations as monolingual English development. Also, differences were observed between children classified according to differing ages of English exposure. In addition, the results of this investigation provide important reference points for typical English morphological acquisition of preschool, Spanish–English children. Bedore and Peña (2008) suggest that the development of appropriate milestones in language development and the consideration of how both languages, Spanish and English, may interact or influence each other will provide a basis for the improvement of assessment of bilingual children.

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Table I

N of children in first grade is not relevant to this study.

	HEC	SEC
N children in Head Start	48	33
N children in first grade	35	22
	Mean (SD) or percentage	Mean (SD) or percentage
Children's age (in years)	3.8 (0.33)	3.8 (0.47)
Children born in Puerto Rico	6%	35%
Mothers' age (in years)	25.5 (4.1)	27.2 (7.8)
Mothers' education (in years)	11.3 (1.2)	10.4 (2.1)
Mothers born in Puerto Rico	55%	89%

Table II

Codes and examples of grammatical morphemes.

Morpheme	Code: present	Code: omitted	Example
Past tense	/ed	/*ed	I walk/ed
			I hop/*ed
Plural	/s	/* s	I eat apple/s
			I eat orange/* s
Possessive	/z	/* z	The girl/z book
			Ernie/*z bag
Third person singular	/3s	/*3s	She walk/3s
		She jump/*3s	
Copula (is, are, am)	‘/cm (cam)	’/*cm (*cam)	I’/cm happy
	’/cs (cis)	’/*cs (*cis)	cAre these mine*
	’/cre (care)	’/*cre (*care)	They’/*cre right there
Auxiliary (is, am, are + ing)	‘/m + /ing (am)	‘/*m+/*ing (*am)	I am try/ing
	‘/s + /ing (is)	‘/*s+/*ing (*is)	He’/*s walk/ing silly
	‘/re + /ing (are)	‘/*re + /*ing (*are)	They’/re go/*ing here
Articles	A	*A	I see a cat
	The	*The	I want *the toy
Prepositions	In	*In	It cis in here
	On	*On	It’/cs not *on the tv
Irregular past tense	[IP]	[*IP]	He ran [IP] away
			Zoe run [*IP] up here
Irregular third person singular	[I3]	[*I3]	She goes [I3] away
			He do [*I3] dish/s

Table III

Samples included in analysis set.

	Fall year 1 *N* (percent)	Spring year 1 *N* (percent)	Fall year 2 *N* (percent)	Spring year 2 *N* (percent)
HEC				
Analysis set	35 (70%)	40 (80%)	36 (72%)	27 (54%)
Less than 50 utterances	13 (26%)	5 (10%)	4 (8%)	9 (18%)
Less than 20% English	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Missing	2 (4%)	5 (10%)	10 (20%)	14 (28%)
SEC				
Analysis set	16 (48%)	19 (58%)	23 (70%)	22 (67%)
Less than 50 utterances	11 (33%)	10 (30%)	8 (24%)	6 (18%)
Less than 20% English	3 (9%)	3 (9%)	0 (0%)	0 (0%)
Missing	3 (9%)	1 (3%)	2 (6%)	5 (15%)

Table IV

N (percent) reaching each level of performance fall year 1.

	<10% accuracy		Early emerging		Emerging		Mastery	
	HEC	**SEC**	**HEC**	**SEC**	**HEC**	**SEC**	**HEC**	**SEC**
Present progressive *–ing*	0 (0%)	0 (0%)	0 (0%)	0 (0%)	10 (31%)	6 (50%)	22 (69%)	6 (50%)
Prepositions *in* and *on*	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (4%)	0 (0%)	24 (96%)	5 (100%)
Plural *–s*	0 (0%)	0 (0%)	1 (3%)	1 (14%)	6 (20%)	2 (29%)	23 (77%)	4 (57%)
Irregular past tense	0 (0%)	0 (0%)	2 (8%)	1 (13%)	10 (40%)	5 (62%)	13 (52%)	2 (25%)
Possessive	0 (0%)	0 (0%)	1 (50%)	0 (0%)	0 (0%)	1 (50%)	1 (50%)	1 (50%)
Uncontractible copula	0 (0%)	1 (8%)	4 (13%)	2 (17%)	15 (52%)	5 (50%)	11 (35%)	3 (25%)
Articles *a* and *the*	0 (0%)	0 (0%)	0 (0%)	1 (5%)	10 (25%)	3 (15%)	30 (75%)	16 (80%)
Past *–ed*	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (25%)	0 (0%)	3 (75%)	3 (100%)
Third person singular	4 (14%)	5 (39%)	7 (24%)	6 (46%)	14 (48%)	2 (15%)	4 (14%)	0 (0%)
Uncontractible auxiliary	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (100%)	1 (100%)	0 (0%)	0 (0%)
Contractible copula	0 (0%)	1 (5%)	4 (10%)	4 (21%)	20 (47%)	11 (58%)	18 (43%)	3 (16%)
Irregular third person singular	1 (17%)	1 (50%)	0 (0%)	0 (0%)	4 (66%)	1 (50%)	1 (17%)	0 (0%)
Contractible auxiliary	0 (0%)	0 (0%)	2 (6%)	3 (23%)	19 (54%)	6 (46%)	14 (40%)	4 (31%)

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Table V

N (percent) reaching each level of performance spring year 1.

	<10% accuracy		Early emerging		Emerging		Mastery	
	HEC	**SEC**	**HEC**	**SEC**	**HEC**	**SEC**	**HEC**	**SEC**
Present progressive *–ing*	0 (0%)	0 (0%)	1 (3%)	0 (0%)	11 (31%)	4 (25%)	23 (66%)	12 (75%)
Prepositions *in* and *on*	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (4%)	1 (10%)	27 (96%)	9 (90%)
Plural *–s*	0 (0%)	0 (0%)	0 (0%)	1 (11%)	3 (9%)	2 (22%)	30 (91%)	6 (67%)
Irregular past tense	0 (0%)	0 (0%)	2 (7%)	0 (0%)	15 (50%)	3 (21%)	13 (43%)	11 (79%)
Possessive	0 (0%)	0 (0%)	1 (9%)	0 (0%)	4 (36%)	0 (0%)	6 (55%)	0 (0%)
Uncontractible copula	0 (0%)	1 (7%)	5 (15%)	4 (29%)	17 (50%)	8 (57%)	12 (35%)	1 (7%)
Articles *a* and *the*	0 (0%)	0 (0%)	0 (0%)	1 (4%)	8 (19%)	9 (39%)	35 (81%)	13 (57%)
Past *–ed*	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (12%)	2 (100%)	7 (88%)	0 (0%)
Third person singular	8 (24%)	3 (18%)	9 (27%)	8 (47%)	10 (30%)	4 (24%)	6 (19%)	2 (11%)
Uncontractible auxiliary	0 (0%)	1 (100%)	1 (33%)	0 (0%)	0 (0%)	0 (0%)	2 (67%)	0 (0%)
Contractible copula	0 (0%)	0 (0%)	4 (9%)	6 (25%)	21 (48%)	10 (42%)	19 (43%)	8 (33%)
Irregular third person singular	0 (0%)	1 (25%)	4 (44%)	2 (50%)	4 (45%)	0 (0%)	1 (11%)	1 (25%)
Contractible auxiliary	1 (3%)	0 (0%)	4 (13%)	1 (6%)	14 (45%)	11 (69%)	12 (39%)	4 (25%)

Clin Linguist Phon. Author manuscript; available in PMC 2012 December 18.

Table VI

N (percent) reaching each level of performance fall year 2.

	<10% accuracy		Early emerging		Emerging		Mastery	
	HEC	SEC	HEC	SEC	HEC	SEC	HEC	SEC
Present progressive *–ing*	0 (0%)	0 (0%)	0 (0%)	0 (0%)	9 (23%)	4 (15%)	30 (77%)	22 (85%)
Prepositions in and on	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (15%)	24 (100%)	11 (85%)
Plural *–s*	0 (0%)	0 (0%)	2 (7%)	2 (12%)	6 (21%)	5 (29%)	20 (72%)	10 (59%)
Irregular past tense	0 (0%)	0 (0%)	1 (4%)	1 (7%)	10 (38%)	6 (43%)	15 (58%)	7 (50%)
Possessive	0 (0%)	0 (0%)	1 (10%)	1 (20%)	3 (30%)	3 (60%)	6 (60%)	6 (20%)
Uncontractible copula	1 (4%)	1 (8%)	7 (26%)	0 (0%)	10 (37%)	6 (46%)	9 (33%)	6 (46%)
Articles *a* and *the*	0 (0%)	0 (0%)	0 (0%)	0 (0%)	8 (20%)	9 (38%)	32 (80%)	15 (62%)
Past *–ed*	0 (0%)	0 (0%)	1 (14%)	0 (0%)	0 (0%)	1 (33%)	6 (86%)	2 (67%)
Third person singular	2 (7%)	2 (13%)	5 (17%)	6 (40%)	15 (50%)	7 (47%)	8 (26%)	0 (0%)
Uncontractible auxiliary	1 (20%)	0 (0%)	1 (20%)	1 (33%)	0 (0%)	2 (67%)	3 (60%)	0 (0%)
Contractible copula	0 (0%)	0 (0%)	2 (5%)	2 (8%)	17 (44%)	12 (48%)	20 (51%)	11 (44%)
Irregular third person singular	2 (25%)	2 (40%)	2 (25%)	0 (0%)	3 (38%)	3 (60%)	1 (12%)	0 (0%)
Contractible auxiliary	0 (0%)	0 (0%)	4 (12%)	3 (14%)	12 (35%)	15 (68%)	18 (53%)	4 (18%)

Clin Linguist Phon. Author manuscript; available in PMC 2012 December 18.

Table VII

N (percent) reaching each level of performance spring year 2.

	<10% accuracy		Early emerging		Emerging		Mastery	
	HEC	**SEC**	**HEC**	**SEC**	**HEC**	**SEC**	**HEC**	**SEC**
Present progressive –*ing*	0 (0%)	0 (0%)	0 (0%)	0 (0%)	4 (14%)	6 (32%)	24 (86%)	13 (68%)
Prepositions *in* and *on*	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	18 (100%)	12 (100%)
Plural –*s*	0 (0%)	0 (0%)	0 (0%)	1 (8%)	6 (22%)	2 (16%)	21 (78%)	10 (76%)
Irregular past tense	0 (0%)	0 (0%)	0 (0%)	0 (0%)	8 (32%)	3 (16%)	17 (68%)	16 (84%)
Possessive	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (25%)	1 (50%)	3 (75%)	1 (50%)
Uncontractible copula	2 (7%)	0 (0%)	1 (3%)	4 (20%)	16 (55%)	7 (35%)	10 (35%)	9 (45%)
Articles *a* and *the*	0 (0%)	0 (0%)	0 (0%)	0 (0%)	4 (12%)	7 (30%)	30 (88%)	16 (70%)
Past –ed	1 (10%)	0 (20%)	0 (10%)	0 (0%)	0 (0%)	1 (20%)	8 (80%)	3 (60%)
Third person singular	0 (0%)	1 (6%)	5 (23%)	6 (38%)	11 (50%)	7 (44%)	6 (27%)	2 (12%)
Uncontractible auxiliary	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (20%)	3 (100%)	4 (80%)	0 (0%)
Contractible copula	0 (0%)	0 (0%)	1 (3%)	0 (0%)	14 (38%)	12 (46%)	22 (59%)	14 (54%)
Irregular third person singular	1 (11%)	1 (11%)	3 (33%)	3 (33%)	5 (56%)	2 (22%)	0 (0%)	3 (34%)
Contractible auxiliary	0 (%)	1 (5%)	1 (3%)	0 (0%)	12 (35%)	7 (35%)	21 (62%)	12 (60%)

Table VIII

Comparison to Brown (1973).

Monolingual	**HEC**	**SEC**
Present progressive *–ing*	*In* and *on*	*In* and *on*
In and *on*	*A* and *the*	Irregular past tense
Plural *–s*	Present progressive –ing	Plural *–s*
Irregular past tense	Uncontractible auxiliary*	*A* and *the*
Possessive	Past *–ed**	Present progressive *–ing*
Uncontractible copula	Plural *–s*	Contractible auxiliary*
A and *the*	Possessive	Past *–ed**
Past *–ed*	Irregular past tense	Contractible copula
Third person singular	Contractible auxiliary	Uncontractible copula
Uncontractible auxiliary	Contractible copula	Possessive
Contractible copula	Uncontractible copula	Irregular third person
Irregular third person	Third person singular	Third person singular
Contractible auxiliary	Irregular third person	Uncontractible auxiliary