Original Article

Comparison of Morphosyntax in Monolingual and Bilingual Children

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Abstract

Introduction: A significant debate surrounding language acquisition in bilinguals concerns how the two languages develop and distinguish in young children. The current study aimed to compare the morphosyntactic development of English monolingual and Spanish-English bilingual children between the age group of 4–6 years. In addition, the present study examined the effect of age on morphosyntactic development as well as the correlation between the morphosyntactic development of bilingual children and their second language exposure. **Methods:** This cross-sectional study compared the performance of monolingual and bilingual participants on English morphosyntactic markers using the test of early grammatical impairment (TEGI) and a language background questionnaire. An independent sample *t*-test was used to compare the groups. **Results:** The results revealed that (1) the monolingual participants performed better than their bilingual peers in their use of English morphosyntactic markers, (2) 5-year-old participants performed better than 4-year-old participants suggesting an age effect, and (3) a positive correlation between second language exposure and scores on TEGI. **Conclusion:** The current study provides insight into the development of grammatical markers in the second language (L2) of bilingual children based on their exposure to L2.

Keywords: Bilingual, morphosyntax, test of early grammatical impairment

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Introduction

Recent research studies indicate that nearly half of the world's population is bilingual.[1,2] The percentage of bilingual speakers in the U.S. increased from 10.68 in 1980 to 20.14 in 2016, based on the American Community Survey.[3,4] Spanish-English bilinguals constitute half the bilingual population in the U.S.[5] With a significant number of children being from a bilingual environment, there is a growing concern regarding the first (L1) and second language (L2) development of children.[6]

A significant debate surrounding language acquisition in bilinguals concerns how the two languages develop and distinguish in young children.[7,8] Two opposing views exist surrounding language acquisition in bilinguals: the first proposes that bilingual children have just one fused system for L1 and L2; the second argues that they maintain a separate and distinct L1 and L2.[9-11] Morphosyntactic development is one of the frequently studied areas within bilingual research. The two most widely discussed theories regarding the morphosyntactic development in bilingual children are the Interdependent Development Hypothesis (IDH) and Separate Development Hypothesis (SDH).[11-13] The IDH states that morphosyntactic development of one language may influence the morphosyntactic development of the other language. On the other hand, SDH indicates that in bilingual speakers, there would be no sign(s) of cross-linguistic influence once the grammatical systems in both languages are separated. In bilingual children, simultaneous acquisition of two or more languages could be considered similar to the development of multiple first languages.[14]

There have been concerns surrounding the order and rate of acquisition of morphemes in bilinguals in their L2. Some studies have found that bilingual children lag behind monolingual peers in the acquisition of L2 morphosyntax.[15] The probable reason for this lag includes cross-linguistic transfer, language exposure, and grammatical complexity.[16-26]

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A single-subject comparative study examined the syntactic transfer in a Cantonese-English bilingual child. It found that the elements of syntax and morphosyntax develop first in comparison to L2. Thus, the participants showed more subtle transfer from English to Cantonese when compared to more prominent transfer happening from Cantonese to English in wh-interrogatives, relative clauses, and structures with null objects.[16]

Gathercole carried out a series of studies to compare the morphosyntactic acquisition of Spanish-English bilingual children and found that bilinguals scored lower than monolinguals across various morphosyntactic tasks. In addition, she examined how the language used at home and in school influenced their language performance.[20-22] The significant findings suggest that the language used at home did not affect the L2 performance of participants to a large extent. While the language of instruction in school positively impacted the performance when the language of testing matched the language used in school. The follow-up studies by Gathercole and collogues in 2005 found that the complexity of the morphological structures influenced the rate of acquisition of morphemes in bilingual children.[24,25] Based on these studies, Gathercole proposed a constructivist model in bilingual language acquisition. This model predicts that bilingual children lag behind their monolingual counterparts during their morphosyntactic acquisition and emphasize the role of language properties in bilingual language acquisition.[27]

Contrary to this concern, some studies found that the order of acquisition of L2 morphemes in bilingual children is similar to that of monolinguals. However, the nature of the morphosyntactic errors and accuracy was different from that of monolinguals.[13,28-32] Bilingual children do have the same rate of morphosyntactic development as monolingual children in their dominant language.[11,33] Paradis and Genesee carried out a morphosyntactic study in French-English 2–3-year-old bilingual children and found that the participants used finite verbs in French earlier than English.[34] They also used appropriate finite and nonfinite pronouns as well as verbal negatives in French and English, suggesting similar morphosyntactic acquisition in bilingual children in comparison to their monolingual counterparts. The morphological errors exhibited by bilinguals are different from those of monolinguals but are typically developmental.[34-36]

It is crucial to determine the age of first and second language acquisition as well as the timing of school entry in bilingual children to understand the rate of acquisition of morphology in this population.[37,38] Children with limited English exposure at home would take more time to adjust with Head Start Programs as the language of instruction is English and, in turn, will have a direct effect on English morphology and proficiency.[39] The usage-based theory of language acquisition suggests that children improve their language knowledge with increased language exposure and experience, and this holds for morphological skills as well.[40]

Previous studies have found that language exposure and input play a significant role in the development of vocabulary in monolingual and bilingual children.[6,15,23,41] However, there have been fewer studies that extended the idea of language exposure and its influence on grammatical development.[11,42] Nicholadis *et al.* found that bilingual children were less accurate in using gender marking and past tense forms when compared to their monolingual counterparts.[26,43] Thordardottir, Rothenberg, Rivard, and Naves found that bilingual children (French-English) with equal exposure to their respective languages performed differently on vocabulary and grammatical measures in both languages in comparison to their monolingual counterparts.[44] Thordardottir examined the morphological development of bilingual children (French-English) with varying language exposure and compared their language development to that of monolingual peers.[42] The present study found that the grammatical development of the participants was dependent on language input.

Furthermore, the simultaneous bilinguals exhibited language-specific morphosyntactic acquisition in their respective languages, similar to that of monolingual counterparts. The language input influenced the rate of acquisition and frequency of errors. Besides, De Houwer suggested that unequal development of grammatical abilities is possible in bilingual children based on SDH.[11]

With the growing number of bilingual immersion programs in the USA, there is a dire need to investigate morphological differentiation within bilingual speakers in comparison to the monolingual speakers.[45] If the bilingual children were to maintain combined mental imagery for two or more languages as suggested by IDH, the two grammatical systems could be fused. If the grammatical systems are merged, the rate of acquisition of morphemes could be different in bilingual children when compared to monolingual children. To test the assumption of SDH, it is necessary to provide evidence that the grammatical development of bilingual children is not qualitatively/quantitatively different from the monolingual acquisition. Spanish-English bilingual children could be a desirable group to test this assumption as this cohort tends to be very common among the bilingual population in the USA.[5] Based on the premise of SDH, it can be hypothesized that there will not be a significant difference in the grammatical development of English between the Spanish-English bilinguals and the monolinguals. There are not many studies that made a direct comparison of the morphosyntactic abilities of monolingual and bilingual participants between the age group of 4 and 6 years. The current study considered this age group as children acquire most of their morpheme acquisition around 4 years.[46]

The aims of the current study were three-fold. First, the present study aimed to compare the English morphosyntactic development of English monolingual and Spanish-English bilingual children between the ages of 4 and 6 years. Second,

the study examined the effect of age on morphosyntactic development among the participants. Third, the current research determined if there was a correlation between the morphosyntactic development of bilingual children and their second language exposure.

Methods

The Institutional Review Board at the author's university provided ethical approval for the current study.

Participants

The participants in this study were 14 Spanish-English bilingual children and 14 English monolinguals between the ages of 4 and 6 years (M = 4.90; standard deviation [SD] = 0.61). The monolingual group recruited for the study was the native speakers of American English without verbal/written exposure to other languages(s). The bilingual group comprised of children who were born in the USA and were exposed to English at school and daycare and Spanish in their home and social circle. Children with a history of speech, language, hearing, or cognitive deficits were excluded from the study. They were screened using a parental questionnaire focusing on speech, language, hearing, and cognitive milestones. Parents of bilingual participants also completed a language background questionnaire and reported their home language use on a 5-point scale from only L1 (1) to only L2 (5), and the results revealed that most of the parents were using both the languages to some extent although not equally. Each of these number ratings was converted to a percentage score for the ease of interpretation. The language background questionnaire was adapted from the previously standardized questionnaires used for bilingual research[47,48] [Appendix 1]. The participants in the study were recruited through nonprobability convenience sampling from a Midwestern state. Tables 1 and 2 provide demographic information of the participants.

Materials

The parents completed a consent form, demographic sheet, and language background questionnaire. The test of early grammatical impairment (TEGI) was administered on both groups to compare their morphosyntactic development.[49] TEGI assess the development of finite verb morphology in children between the age of 3 and 8 years. Morphosyntactic entities like third-person singular (TPS), regular and irregular past tense (REGPAST and IRREGPAST), BE (auxiliary and copula), and DO (auxiliary and copula) are included in TEGI. TPS, REGPAST, IRREGPAST uses pictures to elicit the responses from the child while puppets and few toys were used for BE/DO probe. These probe scores are raw scores that can be used independently from norm-referenced interpretations and are provided in Table 3.[50] The scores on these probes vary on a scale from percentage correct, incorrect, unscorable, and no response. The unscorable responses were excluded from the denominator for the final score. The average of the individual probe scores yielded an Elicited Grammar Composite score (EGC).

Table 1: Details of the monolingual participants

Participants	Age (years)	Sex	L1
1	5.5	Female	English
2	5.9	Female	English
3	5.7	Male	English
4	5.1	Male	English
5	5.5	Female	English
6	5.1	Female	English
7	5	Female	English
8	4.5	Male	English
9	4.1	Female	English
10	4	Female	English
11	4.1	Female	English
12	4.8	Male	English
13	4.7	Male	English
14	4.5	Male	English

Table 2: Details of the bilingual participants

Participants	Age (years)	Sex	L1	L2	Percentage of L2 exposure
1	5.6	Female	Spanish	English	60
2	5.9	Female	Spanish	English	70
3	5.7	Male	Spanish	English	80
4	5.3	Male	Spanish	English	50
5	5.7	Female	Spanish	English	70
6	5.08	Female	Spanish	English	60
7	5	Female	Spanish	English	50
8	4	Female	Spanish	English	50
9	4.25	Female	Spanish	English	60
10	4.6	Male	Spanish	English	50
11	4.6	Male	Spanish	English	50
12	4.58	Male	Spanish	English	50
13	4.08	Female	Spanish	English	60
14	4.6	Male	Spanish	English	50

Table 3: Component specific scores (average in percentage) of the participants on test of early grammatical impairment

Groups	Third person singular	Past tense	Be	Do
Monolingual	87.43	91.57	75.64	75.93
Bilingual	71.07	85.50	71.00	61.00

Procedure

After the parents completed the consent form, background demographic, and language measures, TEGI was administered for each participant. Graduate and undergraduate research assistants completed scoring while administering TEGI. All the sessions were video-recorded for the ease of scoring. All research assistants viewed the training video that came with the TEGI and practised administering the probes on monolingual English-speaking adults and children before using them with the bilingual children.

Statistical analysis

SPSS version 23.0 (IBM Corp., Armonk, NY) was used for the statistical analysis. To determine the possible differences in morphosyntactic development between the two groups (monolingual and bilingual), the EGC scores of the two groups were subjected to a *t-test*. The second analysis compared if the 4-year-old participants varied from the 5-year-old participants on their EGC scores. *Separate t-tests* were carried for the two groups. The final analysis determined if there was a correlation between the EGC scores of the participants and their English language exposure. The English language exposure was determined based on the parental report. The author determined the interrater reliability for EGC scores by randomly choosing 20% of the data and reanalyzing the EGC scores. The interrater reliability was calculated using intraclass correlation (ICC), and a high degree of reliability was found between the two raters. The average measure ICC was 0.91 with a 95% confidence interval from 0.117 to 0.990 (F (5, 5) = 54.53, $P < 0.001$).

Results

The first analysis compared the morphosyntactic development of monolingual and bilingual children. A direct comparison was carried out between the two groups using an independent sample *t*-test. The results revealed that monolinguals (M = 82.64; SD = 8.26) scored better than the bilingual participants (M = 72.14; SD = 13.02) on the EGC scores; t (26) = −2.55, $P = 0.008$. Figure 1 compares the EGC scores across the groups.

The second analysis compared the effect of age on morphosyntactic development in the participants. The EGC scores of 4-year-old participants and 5-year-old participants for both the groups were compared to determine the age effect. The bilingual data suggest that the 5-year-old children (M = 80.71; SD = 9.49) performed better than 4-year-old ones on their EGC scores (M = 63.57; SD = 9.59), t (12) = −3.24, $P = 0.003$. The monolingual data also reported a similar trend to that of bilinguals. The 5-year-old monolingual children (M = 82.64; SD = 7.21) performed better than 4-year-old ones on their EGC scores (M = 77.28; SD = 5.37), t (12) = −3.15, $P = 0.004$.

To determine if there was an association between the morphosyntactic development of bilingual participants and their English language exposure, Pearson product-moment correlation was carried out. The results revealed that there was a significant strong positive correlation between the EGC scores and their language exposure (r [12] = 0.80; $P < 0.01$), suggesting that participants who had higher English language exposure tend to have better EGC scores corresponding to better morphosyntactic abilities. Figure 2 depicts the correlation of language exposure and the EGC scores.

Discussion

The current study compared (1) the morphosyntactic development of monolingual and bilingual children, (2) the effect of age on morphosyntactic development, and (3) the correlation of morphosyntactic development and language exposure in bilingual children. The present study found that bilingual children performed significantly lower than monolingual participants within the age of 4–6 years on morphosyntactic abilities. This lower performance across the multiple grammatical probes in bilingual children can be attributed to their variable language exposure in L2 compared to monolinguals. After conducting a series of studies, Gathercole found that all the native language and the language used in school influenced the language performance of bilingual school-going children. The language used in school largely influenced the L2 language performance in bilingual children compared to the native language.[20-22] Besides, IDH suggests that the two languages in a bilingual child may influence one another differentially during the language acquisition phase.[14] The current study is consistent with the predictions of the constructivist approach to bilingual language acquisition.[27]

The present study found age effects among bilingual

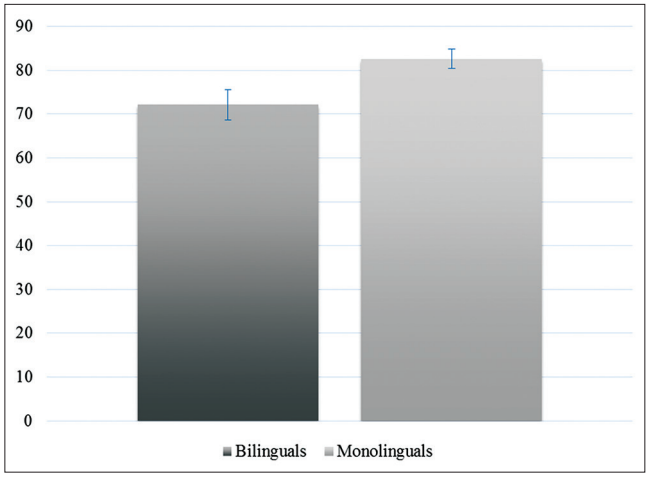

Figure 1: The Elicited Grammar Composite Score across the two groups

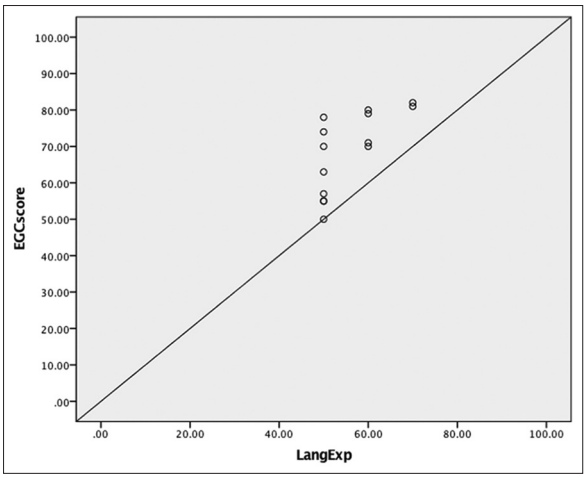

Figure 2: The Correlation of Language Exposure and the Elicited Grammar Composite scores

participants in regards to the morphosyntactic acquisition. The 5-year-old monolingual and bilingual children performed better on morphosyntactic tasks when compared to their 4-year-old counterparts. Participants were able to correctly identify and name the probes when they had encountered them previously. As age increases, children receive better exposure and exhibit better morphosyntactic skills.

The study further examined the relationship between English language exposure in bilingual participants and their EGC scores. The results suggest that bilingual participants with increased language exposure scored better on the morphosyntactic elements than those with limited exposure. The findings of the current study agree with prior studies that found language input and exposure significantly influence the vocabulary and grammatical development of monolingual and bilingual children.[15,23,41,42] Although the current study did not measure the participants' vocabulary development, there was a strong association between morphosyntactic development and language exposure.

Spanish and English have a moderate overlap in terms of morphosyntactic structure. For example, Spanish and English have similar sentence structures while they are different in terms of gender marking, conjugates, and auxiliary verbs. Spanish word structure tends to be more flexible than English.[50] Past studies that evaluated how structural similarity affects the morphosyntactic acquisition of Spanish-English bilinguals found positive cross-linguistic influence.[51,52] The cross-linguistic influence in the current research needs to be interpreted considering the components of TEGI. Based on the component-specific results of TEGI [Table 3], bilinguals performed poorly compared to monolinguals.

There is well-established language acquisition literature that supports the late acquisition of tense marking in L2 learners when compared to the plural and verbal morphemes.[15,46,53-55] D.O. probe and TPS are acquired later in bilingual learners when compared to monolingual peers.[15,56] A small number of studies have found that bilingual children tend to perform on par with monolingual children on B.E.[15,39] The descriptive data [Table 3] suggest that bilingual children consistently showed lower performance on TPS, Past tense, and D.O. probes, consistent with the acquisition pattern in bilingual children.[15] Both groups were able to identify the B.E. probe at a similar rate. The results of the current study contrast the ones that reported the same linguistic milestones for monolinguals and bilinguals as both the groups differed in their acquisition and mastery of morphemes.[8,34] These findings are in line with the constructivist approach that more exposure to input translates to better performance.

Limitations

The first limitation of the current study is the low sample size, and this would have undermined the external validity. Second, the present study only examined the English morphosyntactic ability of the participants and did not compare these skills in L1 among bilingual participants. Another limitation is that only the EGC scores of the participants from TEGI were considered for the analysis. If a conversational sample was collected in addition to the current task, it would have been a better representative of the morphosyntactic ability of the participants. Finally, the present study collected only limited language background from the participants.

Future directions

The current study examined only the morphosyntactic development of bilingual children in their L2. However, it might be worthwhile to compare the same processes in L1 as well. Future research could compare these morphosyntactic features in the clinical population, such as developmental language disorders, and characterize the errors seen in their L1 and L2. Such findings would be crucial in the assessment of the clinical population. Later studies can examine how L2 morphosyntactic acquisition is mediated by L2 vocabulary knowledge.

Conclusion and Clinical Implications

The current study provides an insight into the development of L2 grammatical morphemes in bilingual children based on their exposure to L2. It also includes the information for professionals relevant to bilingual assessment and intervention targets for children from linguistically diverse backgrounds. Although the number of language assessments available for bilingual children has been increasing in the past, these materials are not able to account for the various factors such as the age of L2 acquisition, quantity/quality of the L2 exposure, socioeconomic status, and others. Past studies suggest that language milestones of the bilingual children specific to their L1 and L2 are essential to determine how these languages interact or influence one another, and in turn, will inform the clinical decisions on assessment and intervention.[57,58]

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Conflicts of interest

There are no conflicts of interest.

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Appendix

Appendix 1: Language background questionnaire

Language background questionnaire

(To be filled by the parent)

Name of the child: Today's Date:

Date of Birth: Age of the child:

Sex:

1. List the languages spoken by the child:
2. What language is spoken at home?
3. Describe how often each language is spoken at home (1 = L1 only, 2 = L1 more than L2, 3 = Both equally, 4 = L2 more than L1, 5 = L2 only):
4. When your child is outside the home, what languages are the child exposed to (school/daycare):
5. How often does your child speak English?
6. How often does your child speak a language other than English (Spanish)?
7. Mention the child's dominant language of the child:
8. Did the child learn both languages at the same time? Or did he/she learn one language first followed by the other?
9. Does your child have siblings? If so, how old are they, and what languages do they speak?
10. What languages do you (the parents) speak?
11. Have you ever immigrated from another country to the U.S.? If so, at what age (year)?