Oral and written language abilities in young Spanish/English bilinguals

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Abstract
Purpose: The purpose of this study was to compare oral and written language abilities in English and Spanish of young bilinguals residing in the USA.
Methodology: Sixty-two participants (mean age = 23.7; SD = 3.50), consisting of 42 bilinguals (born of Spanish-speaking parents) and 20 English monolinguals, were administered a battery of 15 language tasks.
Analysis: Bilinguals were divided into two groups: (a) US-born (simultaneous bilinguals who had been exposed to English and Spanish since birth and educated primarily in English) and (b) Latin American-born (early sequential bilinguals who were educated in Spanish and English, although exposed to Spanish at birth and to English before the age of 10).
Findings: Higher lexical ability was demonstrated in English compared to Spanish in bilinguals. Performance in grammar tests of the two languages was inconsistent. Reading/writing ability in English was similar for participants born in the USA and in Latin America; however, participants who were born in Latin America had significantly higher scores for Spanish reading/writing tasks. When comparing performance in English tests, it was found that scores for bilingual participants were similar to those of English monolinguals.
Originality: The current study directly compares oral and written language abilities in two subgroups of young Spanish/English bilinguals. Three language dimensions are studied: lexicon/grammar; oral/written language; and language knowledge/language use.
Implications: Our results suggest that bilingualism does not interfere with normal linguistic ability in English.
Limitations: The current study was carried out in a specific bilingual context. Generalization of these results should be done with caution.

Keywords
Spanish/English bilingualism, second-generation immigrants, grammar, lexicon, written bilingualism

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Introduction

Second-generation immigrants comprise one of the largest samples of bilinguals in the USA. Immigrants usually maintain their native language (first language; L1) at home, but generally utilize English (second language; L2) in social and working environments (Goldstein, 2004). The USA has one of the highest number of immigrants in the world (United States Census Bureau Foreign born, 2012), with about 45 million people born abroad and approximately 50% as native Spanish speakers. Evidently, second-generation Spanish/English bilinguals represent a significant percentage of the American population. The understanding of their linguistic abilities in both languages represents a fundamental question of bilingualism in the USA, which is the purpose of the current study.

Information about the specific language characteristics of this group of bilinguals is relatively limited, and to our best knowledge, no study has compared, in a comprehensive way, the language abilities in simultaneous and early sequential Spanish/English bilinguals. A similar comparison in other languages has been presented. Sebastián-Gallés, Echeverría, and Bosch (2005) compared two groups of Catalan/Spanish simultaneous and early sequential bilinguals in a lexical decision task in Catalan. The results showed that simultaneous bilinguals do not attain the same level of proficiency as early bilinguals in their L1. The analysis of language characteristics in this study, however, was limited.

Language proficiency in lexicon, grammar, and reading/writing ability may be highly variable in bilinguals. Bilinguals, as a matter of fact, represent quite a heterogeneous group. Kohnert, Hernandez, and Bates (1998) selected 100 young bilingual adults who had spoken Spanish since birth and learned English at a mean age of 4.6 (early sequential bilinguals). They administered the Boston Naming Test (BNT) in both Spanish and English (Kaplan, Goodglass, & Weintraub, 1983). Test scores were calculated in three different ways: English only; Spanish only; and a composite score indicating the total number of items correctly named (independent of language). As a whole, responses were significantly more accurate in English than in Spanish, with higher variability in the responses in Spanish.

Gollan, Fennema-Notestine, Montoya, and Jernigan (2007) selected 29 Spanish/English bilinguals who had been living in the USA for an average of 55.8 years (SD = 22.6). The BNT was administered, first in their dominant language, and then in their L2. Bilinguals with similar naming scores in each language (relatively balanced bilinguals) had higher levels of word retrieval when credited for producing a correct name in either language. Balanced bilinguals also named fewer pictures in their dominant language than non-balanced bilinguals (those who are more dominant in one language over the other). However, balanced bilinguals named more pictures correctly in both languages, especially if the pictures had cognate names. The authors concluded that the bilinguals’ ability to name a picture reflects their experience with the formation of words in both languages. Rosselli, Ardila, Jurado, and Salvatierra (2012) analyzed the “cognate facilitation effect” in Spanish/English bilinguals. Their research demonstrated that the advantage of cognate words (e.g., flower – flor) signified a higher speed of recognition and production over non-cognate words (e.g., table – mesa). Therefore, the authors found that bilinguals are able to produce and recognize cognate words more quickly than non-cognate words.

Marchman, Fernald, and Hurtado (2010) examined speech processing efficiency in relation to the vocabulary development of bilingual children learning both Spanish and English. They found that vocabulary size in Spanish was uncorrelated with vocabulary in English, and children’s facility in the online comprehension of Spanish was unrelated to their facility in English. However, efficiency in processing one language was significantly related to the vocabulary size of that particular language. These links between efficiency of lexical access and vocabulary knowledge in
bilinguals parallel those previously reported for Spanish and English monolinguals, suggesting that lexical knowledge in bilinguals can be variable and may depend upon specific characteristics of bilingualism.

Studies approaching the question of grammatical abilities in the L1 and L2 are relatively limited. Cuza (2012) conducted a study to examine cross-linguistic influences in the acquisition of subject–verb inversion (embedded “–wh” questions). Data collected from 17 Spanish/English bilingual participants in this study indicated lower levels of performance in Spanish. Cuza argued that these difficulties arose from the cross-linguistic influence of English, which utilizes different grammatical inversion rules. The participants in Cuza’s study were all born in the USA from native Spanish-speaking parents; 59% of the participants spoke both languages during childhood, while 35% spoke only Spanish. Their language of formal instruction in high school and university was predominantly English. Hartsuiker, Pickering, and Veltkamp (2004) studied 24 native Spanish speakers who spoke English as a L2 and found cross-linguistic syntactic priming during a dialogue card game task. In this study, participants who heard a sentence in Spanish subsequently used the same sentence construction when describing the following card in English. These findings demonstrated that syntactic representation is integrated and shared among languages, shown in both language production and comprehension. Ardila et al. (2000) also found increased Spanish grammar-comprehension as it became more similar to English grammar. These results were shown in a mixed sample of Spanish/English bilinguals, who were US-born (second-generation Hispanic) and Latin American-born immigrants residing in the USA. In addition, language preference was directly correlated with syntactic comprehension.

In addition to oral bilingualism, it is important to analyze the writing abilities in each language of first- and second-generation immigrants. Written bilingualism represents a distinct query of linguistic research. Studies have found that first-generation immigrants often learn the functional second-language oral skills that allow immigrants to meet basic needs and maneuver in informal job markets. However, developing skills in second-language literacy is a difficult task. Glenn and de Jong (1996) and Carbonaro (2006) examined second-language literacy across several nations by analyzing the educational systems and models that have been established for immigrant children. Immigrants’ children usually acquire full literacy in the L2 because they generally attend schools taught in this language. According to Duursma et al. (2007), the bilingual population is unique, as exposure and experiences of literacy in both languages are required in order to achieve the highest levels of bilingualism and bi-literacy. Research has shown that for second-generation Spanish-speaking immigrants in the USA, oral and written proficiency in English does not require parental use of English at home, but oral and written Spanish proficiency requires linguistic reinforcement in both school and home environments.

Several studies have compared differences in linguistic abilities between bilinguals and monolinguals. Sometimes differences in vocabulary size have been reported, suggesting that monolinguals have larger vocabularies when compared to bilinguals. For instance, Bialystok, Luk, Peets, and Yang (2010) reported the results of an analysis of 1738 children between 3 and 10 years old; 772 children were English monolingual speakers and 966 were bilingual speakers. The results demonstrated a consistent difference in receptive vocabulary between the two groups, with monolinguals obtaining higher scores than bilinguals. Two preliminary analyses suggest that this difference does not change with different language pairs that were analyzed (Asian bilinguals – English; non-Asian bilinguals – English) and was largely confined to words relevant to a home context rather than a school context. Other studies have failed in finding differences. For example, Pearson, Fernández, and Oller (1993) compared lexical development in a sample of 25 simultaneous bilingual and 35 monolingual children for whom semilongitudinal data were collected between the ages of 8 and 30 months. There was no statistical basis for concluding that the bilingual children were
slower to develop early vocabulary than the monolinguals. A wide range of vocabulary sizes observed at these ages in normally developing children was also observed in the bilingual children. It is possible that, diverse variables can affect the speed of vocabulary growth in bilinguals, such as the age of introduction of the L2, and the time of daily exposure to each one of the languages.

Some studies have observed the language and literacy skills of second-generation immigrant bilingual children. Lesaux and Geva (2006) determined that a number of variables, including parental education, home literacy, and demographics, affect the levels of second-language reading comprehension in ethnically minority students. Yi (2008) examined voluntary writing exercises of two adolescent Korean/English bilinguals with advanced proficiency in both languages. Multiple data sources were utilized to conduct this study, such as interviews, a literacy activity checklist, field notes, and literacy artifacts. It was found that these particular Korean adolescents moved fluidly between their two languages and cultures. In addition, their use of Korean in writing helped them socialize with their peers, pursue personal interests, and maintain ties with Korea on a daily basis. Simpson (2004) examined 20 writing samples in English and Spanish selected from a portfolio of first graders at a Spanish/English bilingual school in Ecuador. These writing samples were based on physical and topical structure; the characteristics of the paragraphs included the number of words, errors, error types, sentences, and connectors. The structured analysis examined each topical structure by the repetition of key words and phrases provided by the children. The results indicated that these children used a similar amount of topical repetition in both languages.

In conclusion, previous literature comparing the performance of oral and written language tests between the two languages of second-generation Spanish/English bilinguals is scarce. Most studies use samples that either include first-generation immigrants, or combine young immigrants with second-generation bilingual participants; therefore, the language profile of the second-generation bilingual remains unclear. The specific purpose of the current study was to compare the oral and written language performance of Spanish and English in a group of young bilinguals that were divided into two subgroups: simultaneous bilinguals (born in the USA and exposed to both languages since birth) and early sequential bilinguals (born in Latin America – LA – but having learned English before the age of 10). Early sequential bilinguals had received formal education in Spanish before their migration to the USA; consequently, this group had an advantage in receiving formal education in both languages: Spanish and English.

As a measure of the ability to use each language, a test of spontaneous speech and a test of listening comprehension were also included. A group of English monolinguals was selected with the purpose of comparing language performance in bilinguals and monolinguals. It was hypothesized that (1) performance in lexicon and reading/writing would be higher in English than in Spanish (particularly in second-generation bilinguals), since these abilities may represent a type of declarative language learning directly acquired at school (“conscious”); (2) basic grammatical ability would be similar in both languages (possibly higher in Spanish), since grammar represents an early type of procedural learning acquired in an incidental manner usually during childhood (Paradis, 2004; Ullman, 2004); and (3) performance in English tasks by the group of Spanish/English bilinguals would be similar to the performance observed in the group of English monolinguals. These subjects learned English as children and attended school mostly in English. Hence, no language limitations in English were anticipated. If the last hypothesis were to be supported, it signifies that bilingualism does not have an interfering effect in the linguistic ability of the dominant language.

It is important to emphasize that in bilinguals the brain representation of each of the languages depends upon the specific type of bilingualism. Brain representation of the L1 and L2 sometimes is convergent—that is, the very same brain areas are involved in processing the L1 and L2—but also sometimes there is a divergent brain representation—that is, brain representation is not
completely coincidental for the L1 and L2. These differences in brain organization of language between the L1 and L2 are related to a diversity of factors, including age of acquisition, proficiency, and exposure (Hernandez, 2013; Mouthon, Annonia, & Khateb, 2013). Young Spanish/English bilinguals residing in the USA can be divided into two different subgroups: those born in the USA and exposed to both languages since birth (simultaneous bilinguals); and those born in a Spanish-speaking country but arriving to the USA during childhood (early sequential bilinguals). It can be conjectured that in second-generation simultaneous bilinguals not only brain representation but also linguistic abilities for the L1 and L2 are similar, whereas in early sequential bilinguals both languages are more separated in their brain organization and as such in their proficiency.

Methods

Participants

Sixty-two participants (42 Spanish/English bilinguals and 20 English monolinguals) were selected from the South Florida area (Broward and Miami-Dade counties). The majority of participants were college students (46 women and 16 men). Those with neurological, psychological, and/or a history of medical illness were excluded using a structured interview. The purpose of the monolingual control group was to compare the linguistic abilities of bilinguals in English with those of native English monolinguals.

For the bilingual sample, the language used at home while growing up was Spanish, with both parents as native Spanish speakers. All participants identified Spanish as their native language. They had either moved to the USA before the age of 10 from a Latin American country (LA-born participants; \( n = 24 \)) or were born in the USA (US-born participants; \( n = 18 \)). The US-born participants attended school taught entirely in English, with the exception of one participant who received a bilingual education. Sixteen reported English as their dominant language, and two reported both languages as being equally dominant. The LA-born bilingual sample initially received their education in Spanish in their native country, and later in English upon moving to the USA, although three participants continued with a bilingual education in the USA. Twelve LA-born bilinguals reported Spanish as their dominant language, 11 reported English, and one reported no preference. All bilingual participants described the use of both languages on a daily basis; mostly English was spoken at school and with friends, while Spanish was spoken at home with family members.

Language proficiency was assessed by a self-rated questionnaire divided into three sections, speaking, reading, and writing, using a 1–5 Likert-scale (1 = limited, 2 = not very good, 3 = good, 4 = very good, 5 = excellent). Table 1 shows the means and standard deviations of bilinguals’ scores on each section of the questionnaire. The US-born bilingual group reported significantly higher proficiency in speaking and writing in English compared to the LA-born group, whereas the LA-born group had significantly higher scores in reading in Spanish. The groups were equivalent in their level of education but differed in age; the monolingual group was significantly older than the other two groups and, for this reason, age was used as a covariate in all comparisons between the bilingual and monolingual samples. Table 1 shows the general characteristics of the participants.

Instruments

Initially, a bilingualism questionnaire adapted from Paradis (1987) was completed. Furthermore, the following instruments were grouped into four different categories: Lexical Knowledge; Grammatical Knowledge; Reading/Writing; and Ability to Use Language. These tests were individually administered both in English and Spanish to the bilingual sample and in English to
the monolingual group. Several subtests were taken from the Bilingual Aphasia Test (BAT) (Paradis, 1987), a language assessment instrument that contains comparable versions in both English and Spanish (Paradis & Ardila, 1989). The BAT is a reliable and valid measure that not only (1) has completely equivalent assessments in English and Spanish, but also (2) explores a wide range of both oral and written language abilities. The BAT has a low ceiling – that is, a virtually perfect performance is expected in normal populations – as is commonly found in clinical neuropsychology tests and, therefore, any error is considered significant. Additional subtests were taken from general language assessments that are also often utilized in psychology and neuropsychology.

Tests were selected departing from the following considerations: (1) language has two basic dimensions, lexicon and grammar (Ardila, 2011; Bickerton, 2009; Chomsky, 1965; Jakobson & Halle, 2002); (2) language can be expressed in two modalities, oral and written, and finally, (3) there is a basic distinction between language competence (or language knowledge) and language performance (or language use) (Chomsky, 1988, 2006). From these observations, lexical and grammar knowledge tests, oral and written linguistic abilities evaluations, and language knowledge and language use tasks were included in this study.

**Lexical knowledge**

1. **Vocabulary:** The Vocabulary subtest of the WAIS-III in English and Spanish was used (Wechsler, 1997, 1999). It was scored according to the guidelines presented in the Administration and Scoring Manual. Maximum score = 66.

2. **Verbal fluency:** A widely used neuropsychological test that consists of providing the highest number of words corresponding to a specific semantic category, or beginning with a particular letter (Lezak, 2004). Two conditions were utilized: (a) semantic (category) verbal fluency with two categories of animals and fruits (total for both categories) and (b) phonemic (letter) verbal fluency using the letters P, F, and T (total for the three letters).

3. **Semantic acceptability:** Taken from the English (Paradis, 1987) and Spanish versions (Paradis & Ardila, 1989) of the BAT. Ten sentences are read to the subject; he/she is required to say if the sentences make sense or not. Each correct answer is scored as 1 point. Maximum score = 10. Example: “The sun shines by night”.

4. **Repetition of words and nonsense words and lexical decision:** Taken from the BAT English and Spanish versions. The subject is tested on two dimensions: the ability to repeat words and the ability to determine whether the stimulus was a real word. This subtest includes 30 items. Maximum score = 30. Example, “Ball”, “Barsen”.

**Grammatical knowledge**

1. **Syntactic comprehension:** Taken from the BAT English and Spanish versions. Eighty-six sentences are read to the participant. The subject is asked to touch the picture that best represents the idea expressed in the sentence that was read to him/her. The sentences are read with normal intonation. Maximum score = 86. Example: “The boy holds the girl”; the participant has to select the picture that best represents this statement out of four options.

2. **Grammaticality judgment:** Taken from the BAT English and Spanish versions. The subject is asked to determine if a sentence read to him/her is correct or incorrect by saying “Yes” or “No”, respectively, in English or Spanish. Ten sentences are included. Maximum score = 10. Example: “It’s the boy kiss the girl”.
3. Derivational morphology: Taken from the BAT English and Spanish versions. The subject is asked to produce a target word (adjective) after being given a corresponding noun. Ten nouns are used. Maximum score = 10. Example: “Power” (the correct answer is “powerful”).

4. Morphological opposites: Taken from the BAT English and Spanish versions. The subject is asked to add a morpheme to a given adjective in order to change its meaning. Ten stimuli are used. Maximum score = 10. Example: “Trust” (the correct answer is “distrust”).

C. Reading and writing

1. Silent reading (reading/understanding): Taken from the BAT English and Spanish versions. The subject is required to read a paragraph silently and then asked to answer questions about the passage. Maximum score = 6. The following paragraph is used: “The man left to go fishing with his son. They caught some trout. When they returned to the village, they went to the market and exchanged their trout for a chicken”. Example of a question: “Where did the man and his son go?”

2. Reading speed (words per minute): Two 645-word paragraphs were taken from Spanish (Garcia-Marquez, 1970) and English (Hemingway, 1938) literature. The subject was requested to read them aloud. A tape recorder was used and speed was measured by dividing 645 by the duration of reading the paragraph in minutes.

3. Dictation: Taken from the BAT English and Spanish versions. Several words and sentences are read, and the participant is required to write them down. Maximum score = 10. Examples, “Fat”, “He sprays himself”.

4. Spontaneous writing: The participant is asked to write spontaneously about what he/she observes in the picture “The cookie thief” from the Boston Diagnostic Aphasia Examination (Goodglass & Kaplan, 2000). The total score corresponds to the number of written words.

Table 1. Demographic characteristics of the sample.

<table>
<thead>
<tr>
<th></th>
<th>Bilinguals</th>
<th></th>
<th>Monolinguals</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>US-born</td>
<td>LA-born</td>
<td>n = 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>23.7</td>
<td>23.6</td>
<td>28.0</td>
<td>6.17</td>
<td>.04</td>
</tr>
<tr>
<td>Years of education</td>
<td>15.7</td>
<td>16.4</td>
<td>15.3</td>
<td>0.39</td>
<td>.67</td>
</tr>
<tr>
<td>Years in USA</td>
<td>—</td>
<td>14.4</td>
<td>—</td>
<td></td>
<td></td>
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<tr>
<td>Level of English proficiency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaking</td>
<td>4.78</td>
<td>4.10</td>
<td>4.56</td>
<td>15.29</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Writing</td>
<td>4.56</td>
<td>3.86</td>
<td>3.86</td>
<td>10.28</td>
<td>.003</td>
</tr>
<tr>
<td>Reading</td>
<td>4.36</td>
<td>4.57</td>
<td>4.57</td>
<td>.01</td>
<td>.935</td>
</tr>
<tr>
<td>Level of Spanish proficiency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaking</td>
<td>3.56</td>
<td>4.05</td>
<td>2.89</td>
<td>2.95</td>
<td>.094</td>
</tr>
<tr>
<td>Writing</td>
<td>2.89</td>
<td>3.33</td>
<td>2.89</td>
<td>1.59</td>
<td>.215</td>
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<tr>
<td>Reading</td>
<td>3.11</td>
<td>4.00</td>
<td>3.11</td>
<td>11.92</td>
<td>.001</td>
</tr>
</tbody>
</table>

*Total years of education.
US-born (5 men, 13 women), Latin America (LA)-born (7 men, 17 women), monolinguals (5 men, 15 women).
D. Ability to use language

1. **Spontaneous speech:** Taken from the BAT English and Spanish versions. The participant’s spoken description of Picture #1 “The cookie thief” from the Boston Diagnostic Aphasia Examination (Goodglass & Kaplan, 2000) is recorded. Five characteristics of speech, such as accuracy, pronunciation, grammar, and vocabulary, are measured on a 1–5 scale. Maximum score = 20.

2. **Listening comprehension:** Taken from the BAT English and Spanish versions. The subject hears a short story and is presented with five questions. The following story is used: “On Saturday afternoon, the boy and his sister were at the beach. The boy bought an ice-cream for his sister because it was very hot. But before she could eat it, the girl dropped the ice-cream on the sand”. Maximum score = 5. Example of a question: “Where were the boy and his sister?”

Procedure

After obtaining informed consent, participants were tested in one 60–90 minute session. A total of 14 oral and written language knowledge tasks were administered in both Spanish and English to the bilingual group, and in English to the monolingual group. One of the tasks, verbal fluency, had two different scores. For bilinguals, language order was randomly assigned. However, the administration of the tests followed the same language order. Prior to testing, a short questionnaire was also given to examine the participants’ bilingualism history.

Statistical analyses

To compare Spanish and English task performance between US-born and LA-born bilingual groups, 2 × 2 mixed General Linear Model analyses were conducted. The within and between factors were language and country of origin, respectively. To correct for Type I error due to 15 multiple comparisons, $p$-values were set for these analyses at $p < .003$.

Univariate analyses were done to compare the performance of the whole bilingual group to the performance of the monolingual group ($p$-values were also set for these analyses at $p < .003$).

Results

The results that are being discussed focus on differences between the two bilingual groups. General results of the bilingual groups’ performance in each of the language tests are presented in Table 2. A visual inspection of this table demonstrates that overall performance was similar in both languages, suggesting substantial knowledge of both English and Spanish among the bilingual participants. For most of the tests, differences in performance between English and Spanish were about 5–10%.

Lexical knowledge

1. **Vocabulary:** In the Vocabulary subtest, both the country of origin and language effects were statistically significant, as well as the interaction between them. The main effects showed that total performance was higher in English (M = 46.3; SD = 6.1) than in Spanish (M = 35.6; SD = 9.3) and the LA-born participants scored significantly higher in total vocabulary (M = 45.5; SD = 7.5) than the US-born participants (M = 36.4; SD = 7.9). The
Table 2. Means ± SD and main and interaction effects among US-born and Latin America (LA)-born bilinguals by country of birth and language.

<table>
<thead>
<tr>
<th>Test</th>
<th>Spanish</th>
<th>English</th>
<th>Bilingual group</th>
<th>Language</th>
<th>Interaction</th>
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</thead>
<tbody>
<tr>
<td>A. Lexical knowledge</td>
<td></td>
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</tr>
<tr>
<td>Vocabulary</td>
<td>26.7 ± 10.7</td>
<td>44.5 ± 7.90</td>
<td>46.1 ± 5.1</td>
<td>46.6 ± 7.1</td>
<td>25.4</td>
</tr>
<tr>
<td>Verbal fluency</td>
<td></td>
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<tr>
<td>Semantic</td>
<td>22.4 ± 5.8</td>
<td>30.5 ± 9.7</td>
<td>34.8 ± 6.7</td>
<td>32.5 ± 6.3</td>
<td>2.0</td>
</tr>
<tr>
<td>Letter</td>
<td>25.2 ± 9.2</td>
<td>36.8 ± 13.3</td>
<td>40.2 ± 10.7</td>
<td>39.5 ± 10.8</td>
<td>2.9</td>
</tr>
<tr>
<td>Semantic access</td>
<td>9.3 ± 1.0</td>
<td>9.6 ± 0.7</td>
<td>9.9 ± 0.3</td>
<td>9.8 ± 0.61</td>
<td>0.14</td>
</tr>
<tr>
<td>Repetition</td>
<td>27.6 ± 1.8</td>
<td>29.0 ± 1.7</td>
<td>29.0 ± 1.5</td>
<td>28.0 ± 2.0</td>
<td>0.35</td>
</tr>
<tr>
<td>B. Grammatical knowledge</td>
<td></td>
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<tr>
<td>Synt comprehension</td>
<td>81.6 ± 5.7</td>
<td>82.5 ± 3.2</td>
<td>79.3 ± 11.3</td>
<td>78.3 ± 17.1</td>
<td>0.001</td>
</tr>
<tr>
<td>Grammatical judgment</td>
<td>8.6 ± 1.2</td>
<td>9.3 ± 1.1</td>
<td>9.3 ± 1.1</td>
<td>9.4 ± 1.0</td>
<td>2.60</td>
</tr>
<tr>
<td>Derivat morphology</td>
<td>6.6 ± 2.0</td>
<td>8.9 ± 1.0</td>
<td>8.8 ± 1.1</td>
<td>8.5 ± 2.3</td>
<td>7.6</td>
</tr>
<tr>
<td>Morpholog opposites</td>
<td>8.2 ± 1.2</td>
<td>9.2 ± 0.9</td>
<td>7.6 ± 1.5</td>
<td>7.6 ± 2.3</td>
<td>2.2</td>
</tr>
<tr>
<td>C. Reading and writing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Silent reading</td>
<td>4.7 ± 1.3</td>
<td>5.3 ± 1.1</td>
<td>5.6 ± 0.8</td>
<td>5.5 ± 1.1</td>
<td>0.65</td>
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<tr>
<td>Reading speed (wpm)</td>
<td>90.7 ± 22.2</td>
<td>128.8 ± 39.4</td>
<td>147.1 ± 10.9</td>
<td>144.5 ± 27.5</td>
<td>8.20</td>
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<tr>
<td>Dictation</td>
<td>8.5 ± 1.5</td>
<td>9.5 ± 0.8</td>
<td>9.4 ± 0.9</td>
<td>9.1 ± 1.4</td>
<td>1.50</td>
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<tr>
<td>Spontaneous writing</td>
<td>14.1 ± 2.7</td>
<td>16.3 ± 3.3</td>
<td>18.3 ± 2.0</td>
<td>16.5 ± 2.7</td>
<td>0.09</td>
</tr>
<tr>
<td>D. Ability to use language</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spontaneous speech</td>
<td>14.9 ± 5.2</td>
<td>18.3 ± 1.9</td>
<td>19.7 ± 0.8</td>
<td>18.75 ± 2.0</td>
<td>4.10</td>
</tr>
<tr>
<td>List comprehension</td>
<td>3.7 ± 0.9</td>
<td>4.3 ± 0.7</td>
<td>4.3 ± 0.6</td>
<td>4.5 ± 0.5</td>
<td>9.50</td>
</tr>
</tbody>
</table>
interaction shows that the language difference in vocabulary is only significant for bilin-
guals born in the USA, despite having similar performance in English to LA-born bilin-
guals. However, the Spanish vocabulary was reduced by about 40% of US-born participants. The η² shows that around 40% of the variance is explained by this interaction.

2. **Verbal fluency:** For both the semantic and the phonemic (letter) condition, the interaction of country of origin with language was statistically significant. Performance was higher in English than in Spanish for the letter condition (English: M = 39.8; SD = 10.6; Spanish M = 31.8; SD = 13.01) as well as for the semantic condition (English: M = 33.5; SD = 6.53; Spanish M = 27.0; SD = 9.15). The main effect of country of origin did not reach significance; the significant interactions in both conditions demonstrated that while the LA-born group did not show language differences on verbal fluency tests, the US-born showed significantly lower scores on the Spanish verbal fluency tasks compared to the English tasks. The η² value suggests that around 35% of the variance in these scores can be explained by the interactions between country of origin and the administration language of the tasks.

3. **Semantic accessibility:** In this subtest, performance was higher in English than in Spanish; however, the language effect did not reach significance based on the corrected p-value. Neither the main effect of country of origin nor the interaction between country of origin and language were significant.

4. **Repetition of words and nonsense words and lexical decision:** No significant main effects were found, although the interaction was close to obtaining significance.

In summary, the results were in general support of a higher lexical ability in English than in Spanish. In Spanish, the lexicon of the US-born participants was significantly reduced. There were no evident differences in the English and Spanish lexicon for the LA-born participants.

**Grammatical knowledge**

1. **Syntactic comprehension:** No statistically significant differences were observed.
2. **Grammaticality judgment:** No statistically significant differences were found.
3. **Derivational morphology:** Both the country of origin and language main effects were statistically significant, as well as the interaction between them. Performance was significantly higher in English (M = 8.65; SD = 1.7) than in Spanish (M = 7.75; SD = 1.5). However, LA-born participants had significantly higher scores (M = 8.7; SD = 1.6) than US-born participants (M = 7.7; SD = 1.5) in Spanish. The interaction shows that performance in Spanish was significantly higher for those born in LA, whereas performance in English was similar for both bilingual groups. This interaction explains approximately 40% of the variance as reflected in the η² value.

4. **Morphological opposites:** A significant language effect was found for this subtest with no effect of country of origin and no significant interaction. Performance was significantly higher in Spanish (M = 8.7; SD = 1.0) than in English (M = 7.6; SD = 1.9), independent of country of origin. This language effect explained around 21% of the variance as indicated by the η² value.

In summary, the LA-born bilinguals performed equally well on the morphological tasks in both languages, whereas the US-born group had significantly lower performance in the Spanish tasks compared to those in English. The performance on the other three tasks was not different among the bilingual groups. There was similar performance in Spanish and English with the exception of
the morphological opposite task, which appeared to be easier in Spanish when compared to the equivalent task in English.

**Reading and writing**

1. **Silent reading:** A trend for statistical significance \((p < .05)\) was found between English \((M = 5.55; SD = 0.95)\) and Spanish \((M = 5.0; SD = 1.2)\), with higher performance in English. No significant groups or interaction effects were observed.

2. **Reading speed:** Both the country of origin and language effects were statistically significant, as well as the interaction between them. For both groups, reading speed was significantly faster in English than in Spanish. The total average number of words per minute (wpm) in English was 145.5 \((SD = 19.2)\), compared to an average of 109.75 wpm in Spanish \((SD = 30.8)\). The LA-born participants read faster when combining the speed in both languages \((M = 136.65; SD = 33.45)\) than the US-born participants \((M = 118.9; SD = 16.55)\). This effect explains 46% of the variance within the scores \((\eta^2 = .46)\). The significant interaction shows that the difference in reading speed between the Spanish and English texts is much larger in the US-born bilingual group, \((F (1,18) = 114.59; p < .0001; \eta^2 = .871)\) compared to that of the LA-born bilingual group \((F (1, 23) = 2.48; p = .128; \eta^2 = .098)\). This interaction explains 21% of the variance based on the \(\eta^2\) value.

3. **Dictation:** Only the interaction between language and country of origin showed a trend that was statistically significant \((p = .017)\). In Spanish tests, LA-born participants scored higher than US-born participants.

4. **Spontaneous writing:** There was a significant effect of language and an interaction that was statistically significant. Scores were higher in English than in Spanish for participants born in the US. For LA-born participants, performance was similar in English and Spanish. Participants born in the US had lower scores in spontaneous writing in Spanish. The interaction of language and country of origin explained 31% of the variance in the spontaneous writing scores.

In summary, reading ability in English was similar in bilinguals independent of country of origin, but reading in Spanish was significantly higher for participants born in LA. On the same note, writing in Spanish was superior for LA-born participants, whereas scores in English writing were higher for US-born participants.

**Ability to use language**

1. **Spontaneous speech:** The main effect of language was significant, indicating that a higher quantity of words was produced by bilingual participants in English \((M = 19.2; SD = 1.4)\) than in Spanish \((M = 16.6; SD = 3.5)\). The group \(\times\) language interaction was also statistically significant, explaining around 22% of the score variance. For participants born in the USA, performance was higher in English than in Spanish. For LA-born participants, performance was similar in both languages. The language discrepancy in the scores was significant only for the US-born group.

2. **Listening comprehension:** A main effect of country of origin showed a trend to significance \((p = .004)\) with higher scores in the LA-born group \((M = 4.4; SD = .6)\) than in the US-born group \((M = 4.0; SD = .7)\), although this difference was only observed in the Spanish task. The language main effect or the group \(\times\) language interaction did not reach statistical significance (see Table 2).
In summary, bilingual participants born in the USA presented a decreased ability to use the Spanish language. Performance in English was similar in both bilingual groups and performance in Spanish was similar to the performance in English for LA-born participants.

In addition, a final analysis of scores in English was compared to those obtained by a group of English monolingual speakers using age as a covariate (Table 3). Evidently, scores were quite similar in both groups. Significant differences between groups were only found in one task (Spontaneous writing). The number of words in Spontaneous writing was significantly higher in bilinguals than in monolinguals. In all other tests, the bilinguals’ scores were equivalent to those of the monolingual group. Age was a significant covariate only in Letter fluency, $F(1,59) = 4.65, p = .035, \eta^2 = .077$ and a trend of significance for the effect of age was observed in Vocabulary, $F(1,59) = 3.67, p = .06, \eta^2 = .062$.

**Discussion**

**Hypotheses**

In this study, language abilities were analyzed in a group of young Spanish/English bilinguals divided into two subgroups: simultaneous and early sequential. In general, performance was similar in both languages, and the largest differences were approximately 5–10%, suggesting an elevated level of bilingualism. The three hypotheses guiding this research were generally supported: (1) performance in lexicon and reading/writing was higher in English than in Spanish; (2) basic
grammatical ability was similar in both languages; and (3) performance by Spanish/English bilin-
guals in English tasks was equivalent to that of a group of monolinguals.

As expected, bilinguals were more capable of defining words in English than in Spanish. They
also demonstrated an increased ability to search and access English words in semantic and phono-
logical categories when compared to Spanish words. This language disparity was only observed in
bilinguals who were born in the USA; bilinguals who grew up in a Latin American country showed
an equal level of lexical knowledge in both Spanish and English. This LA-born group, as opposed
to the US-born group, received their early education in Spanish, a factor that was clearly advanta-
geous in the development of lexical knowledge in Spanish. The decreased performance in Spanish
by the US-born participants can be interpreted as a result of lower exposure to Spanish than
LA-born participants during early childhood.

When directly comparing the vocabulary in English of bilinguals with the vocabulary of mono-
lingual English speakers, a non-significant difference of less than 10% in scores was observed
(average scores of 46.38 and 50.85, respectively). Also, no differences in bilingual and monolin-
gual verbal fluency scores were found. These findings are in contradiction with some of our own
previous research, in which bilinguals were found to score lower than monolinguals on semantic
fluency tasks (Rosselli et al., 2000). Despite both samples of the current study and Rosselli et al.’s
study residing in South Florida, the discrepancy of the results may be explained by the differing
demographical characteristics of the two distinct samples. The current sample included young col-
lege students, whereas Rosselli et al.’s sample comprised older participants. Unfortunately, it was
not possible to compare our bilinguals’ Spanish performance with that of monolingual Spanish
speakers in the current study. This limitation was caused by the difficulty in finding monolingual
Spanish speakers with similar demographical characteristics, such as age and level of education, in
the South Florida area.

The current results support previous studies, which indicate that in young bilingual adults, lexi-
cal knowledge is higher in English than in Spanish and, additionally, significant variability is
observed (Kohnert, Hernandez, & Bates, 1998).

Results in the grammar tests were mixed. In some tests, such as Derivational morphology,
scores were higher in English than in Spanish but only for the US-born group; language differences
were not observed in the LA-born group. It can be conjectured that our subjects learned basic
Spanish grammar at home, and both basic and complex English grammar at school. It is likely that
the LA-born sample also acquired additional complex Spanish grammar abilities during their early
schooling in Spanish while in their native countries before immigrating to the USA. Interestingly,
no language or group differences were observed in the Syntactic comprehension and Grammatical
judgment tasks. The Morphological opposites task was found to be easier in Spanish than in
English by both groups of bilinguals, yet the reason for this difference is unclear. It could be specu-
lated that because of the morphological complexity found in Spanish, morphological changes are
more evident when compared to English (Rubba, 1998). Upon comparing Spanish/English bilin-
guals’ grammatical knowledge with that of monolinguals, no differences were observed, support-
ing the assumption that in English, bilinguals master a high level of linguistic competence for both
languages. It is known that grammar represents a type of incidental learning (Fabbro, 1999; Paradis,
2004; Ullman, 2001); consequently, it is understandable that grammatical knowledge in Spanish is
relatively higher for early sequential bilinguals exposed only to Spanish for several years, whereas
grammatical knowledge in English is similar in both bilingual groups.

Results in the reading/writing section of our test battery appear evident. Our bilingual subjects
have adequate knowledge of written language in English, but the ability to read and write in
Spanish is less developed. This was mostly observed in those born in the USA. Latin American
immigrants frequently, but not always, teach their children to read and write in Spanish. However,
this form of language acquisition is usually not as intense and systematic as the reading and writing education received in a school environment (Ardila, 2016).

**Language use**

The ability to use Spanish and English, especially the pragmatic perspective of language, was different among groups. Both groups of bilinguals were proficient in their ability to use English in expression and understanding. However, only participants born in LA demonstrated a similar ability to communicate in Spanish and English. Spontaneous speech and listening comprehension in the US-born group was mild (about 10%) but significantly decreased in Spanish. This result could be a consequence of the different levels of exposure to Spanish during early childhood years. To fluently acquire a second language, a child must be exposed to the language for 20–25% of the time (Byers-Heinlein & Lew-Williams, 2013; De Houwer, 2007). It is important to consider, however, that the current exposure to Spanish and English for both groups is similar; both groups speak mostly Spanish at home and in interactions with family members, while English is generally used at school. However, bilingual interactions were also reported with friends and at work.

**Comparisons between bilinguals and monolinguals**

A crucial result of our study is the comparison of the performance of English tasks among the bilingual and the monolingual groups. As a whole, performance was quite similar. The only significant difference was found in Spontaneous writing tests; scores were higher in bilinguals than in monolinguals. This signifies that the number of words used to describe a picture was higher for bilinguals. It is not easy to find an explanation for this finding, but it could potentially be related to cultural rather than linguistic factors, as it is well known that the language expression style differs cross-culturally (Kim & Markus, 2002). Our two subsamples had different cultural backgrounds: our bilingual participants were Latinos, whereas our monolingual sample was more acculturated to American behavior and customs. Nevertheless, it is truly important to recognize that the performance was quite similar in both groups, suggesting that bilingualism does not represent an interfering factor of performance in the more commonly used language (English). The social and educational consequences of this finding may potentially be very impactful.

LA-born bilinguals, whose performance was comparable to that of monolinguals in most tests, demonstrated that the acquisition of a L2 at a later point in life does not signify lower levels of fluency in that L2. On the contrary, this finding lends support to the idea that other factors, besides age of acquisition of L2, may contribute to competence in the L2 (Rosselli, Ardila, Lalwani, & Velez-Uribe, 2016). The academic performance of children of immigrants can be at the same level or even higher than the academic performance of monolingual English-speaking children (Kao & Tienda, 1995). Moreover, Han (2008) found that the academic trajectory of children of LA immigrants tended to close the initial gaps in readings and math relative to their native-born white peers much faster than children of immigrants from other non-Hispanic countries.

As mentioned before, it is usually assumed that bilinguals may have a partially coincidental but also partially different brain organization for the L1 and L2 (Hernandez, 2013; Mouthon, Annonia, & Khateb, 2013). We were supposing that in simultaneous bilinguals brain representations as well as linguistic abilities for the L1 and L2 were similar, however, in early sequential bilinguals, language proficiency was partially different in Spanish and English. We found that, in general, proficiency in Spanish was only mildly superior for LA-born participants, whereas proficiency in English was mildly superior in English for US-born participants. Different factors
can affect the language proficiency, but in our sample it is not difficult to suppose that school language played the crucial role.

**Limitations**

A diversity of limitations could be highlighted in this study. Not only was the sample relatively small, but it also corresponds to a very particular type of bilingualism. Bilingualism is quite a heterogeneous ability, and our participants provided a specific age, level of education, and certain environmental conditions. The generalization of our results should be done with extreme caution. Regardless, an effort was exerted to cover different language levels, utilizing standard tests that have previously examined the abilities of bilinguals, but evidently many language aspects, such as phonology, need to be explored further.

**Future directions of research**

Some suggestions for future directions of research are (1) to extend the analysis of language abilities in this group of Spanish/English bilinguals, including individuals with different levels of education, in order to pinpoint the potential effect of education on their linguistic abilities; (2) to evaluate the contribution of the quality of education received in each language on bilinguals’ linguistic abilities; (3) to administer a broader evaluation, including other language levels such as phonology and pragmatics; (4) to study additional groups of bilinguals with similar living experiential conditions (for instance, Chinese/English bilinguals in New York, Turkish/German bilinguals in Berlin, etc.). Such research studies may allow advancement in our understanding of the language characteristics of young simultaneous and early sequential bilinguals.

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