

Adapting a Picture Description Task for Grammatical Analysis in English–Spanish Bilingual Preschool Children

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Abstract

The purpose of this study was to assess the use of an adapted picture description task described by Eisenberg and Guo to explore the morphosyntactic error patterns of English–Spanish preschool simultaneous bilingual learners. Language samples were collected from 28 bilingual preschool children aged 3 to 5 years. Language samples were elicited in both English and Spanish using a series of pictures and elicitation questions/prompts. Twenty-one participants produced a language sample in only one language (16 in English and 5 in Spanish) and seven participants produced language samples in both languages. Language samples were analyzed for grammaticality and error types. There were a higher number of fragments, tense marker, and grammatical morphemes errors in English. In Spanish, the children demonstrated more argument structure and pronominal form errors than in English. The adapted picture description task demonstrated sensitivity to common errors in English and Spanish and shows promise for use with bilingual populations.

Keywords

3 to 5 years, as a second language (ESL)/bilingualism/dialects, English/languages, delays/disorders, language/linguistics, syntax

Identifying language disorders in culturally and linguistically diverse populations is difficult due to the limited availability and possible bias of the diagnostic instruments that are available (Gillam et al., 2013). Language sample analysis (LSA) is an effective method for assessing the language skills of bilingual children (Dollaghan & Horner, 2011). A variety of naturalistic contexts allow for LSA including narratives, play, and picture descriptions (Eisenberg & Guo, 2013; Kapantzoglou et al., 2017; Miller & Iglesias, 2012). LSA can be utilized by clinicians to assess a variety of linguistic components, including morphosyntactic structures.

Morphosyntax

Children with developmental language disorders (DLDs) have significant deficits in the area of morphosyntax when compared with typically developing children (Bedore & Leonard, 2005; Leonard, 1995; Rice & Wexler, 1996). Research has shown that bilingual children with DLDs exhibit different error patterns across languages (Bedore & Leonard, 2001; Restrepo & Kruth, 2000). In English, difficulties with finite verb morphemes that mark tense and agreement have been identified as diagnostic markers for DLDs (Bedore & Leonard, 1998; Leonard et al., 1999; Rice & Wexler, 1996). In Spanish, articles and clitics have been

identified as possible markers for DLDs (Baron et al., 2018; Bedore & Leonard, 2001). Monolingual Spanish-speaking children may present with different error patterns than bilingual Spanish-speaking children who are exposed to English (Jackson-Maldonado & Maldonado, 2017). Jackson-Maldonado and Maldonado (2017) assessed monolingual Spanish-speaking children in Mexico and found that children with DLDs presented with more article and preposition omissions but did not find a significant difference in the use of clitics or verb phrases when comparing children with DLDs and language-matched peers.

Assessment of morphosyntax in bilingual children is complicated by changing language patterns across second-language (L2) acquisition (Gillam et al., 2013). Children may exhibit grammatical errors in their first language (L1) as a result of the language shift that occurs as they learn their L2 (Schiff-Myers, 1992). These patterns of errors may

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vary and even increase as the child gets older due to possible attrition in their L1 (Gutiérrez-Clellen et al., 2000). The grammatical system is often the most impacted by this language shift (Gutiérrez-Clellen et al., 2000; Sorace, 2004). Several theories have been developed to explain this phenomenon including Cummins “interdependence theory,” which states that introduction of L2 prior to the full development of L1 may lead to attrition or arrest in development of L1 particularly when L1 is not fully supported (Cummins, 1979; Schiff-Myers, 1992). The interdependence theory advocates for supporting the development of L1 as this leads to transfer of skills and positively impacts the development of L2 (Cummins, 1979). Other theories suggest that grammatical errors in L1 may occur as a result of the influence of grammatical structures in L2 (Sorace, 2004). For instance, gender agreement may be affected in Spanish (L1) as nouns are not marked for gender in English (L2). Nonetheless, it is imperative that clinicians consider the possibility that error patterns present in L1 may be due to attrition as L2 is developing. This highlights the need to carefully analyze error patterns when assessing bilingual clients, which may be done most effectively utilizing LSA.

Language Sample Analysis

It is imperative for clinicians to collect language samples when analyzing the morphosyntactic errors produced by children to ensure an accurate diagnosis of DLDs and also aid in developing an appropriate treatment plan. Clinicians assessing bilingual children should collect a language samples in both languages (Gutiérrez-Clellen et al., 2000). However, researchers have not yet established the best elicitation method for collecting language samples from young children. Even though narratives in the form of story retell or story tells are frequently used to collect language samples to assess morphosyntax in children (Fey et al., 2004; Fiestas & Peña, 2014; Kapantzoglou et al., 2017; Scott & Windsor, 2000), narrative skills are only emerging in younger children. This may affect the length and quality of language samples collected when assessing children younger than 5 years (Muñoz et al., 2003; Trabasso et al., 1991). Furthermore, although other developmentally appropriate elicitation methods have been used with younger children (e.g., conversation, free play, and personal stories), results have varied (Atkins & Cartwright, 1982; Southwood & Russell, 2004). However, the use of pictures in eliciting language samples has been supported, as pictures provide a common reference for the clinician and child and decreases memory demands placed on the child (Kapantzoglou et al., 2017). Eisenberg and Guo (2013) effectively utilized a picture description task with 3-year-old monolingual English speakers. The picture description task provided pictorial support by presenting one picture at a time and asking children to describe

the picture and finish a story when provided with story starters to aid in collecting language samples.

One barrier that clinicians often report in using LSA is the amount of time it takes to collect and analyze the samples (Heilman et al., 2010). This concern is likely present to some degree in clinicians assessing bilingual clients who must collect and analyze a sample in each language. For this reason, it is important to explore feasible elicitation methods that will provide clinicians with adequate language samples to assess the morphosyntactic development of young bilingual children. Shorter language samples have been found to be effective (Eisenberg & Guo, 2015; Heilman et al., 2010). Indeed, Eisenberg and Guo (2015) were able to effectively shorten their original 15-picture task to just 7 pictures for assessing grammaticality in 3-year-old monolingual children.

Eisenberg and Guo (2013) utilized this picture description task to examine the diagnostic accuracy of three LSA measures to differentiate young children with and without DLDs. They discussed a concern of focusing only on verb tense errors and suggested using a general morphosyntactic measure to account for all the morphosyntactic errors that children produce. As such, they used three different types of measures: (a) Percent grammatical utterance (PGU) which is a broad measure of the percentage of all grammatical utterances in a sample, (b) Percentage verb tense usage (PVT) which accounts only for errors in verb markers, and (c) Percentage sentence point (PSP) that assesses only utterances that have a subject and main verb. These three measures were compared in the language samples of 3-year-olds. PGUs demonstrated similar sensitivity but slightly higher specificity than the other two measures suggesting PGUs as an effective measure to screen for DLDs.

The use of the picture description task in the Eisenberg and Guo (2013) study was limited to monolingual English-speaking children. In this current study, we sought to extend the use of this picture description task to bilingual children. We explored the feasibility of using an adapted picture description task and grammaticality analysis using seven pictures (Eisenberg & Guo, 2013, 2015) by examining the error patterns produced by young English–Spanish bilingual children living in a border community.

Method

Participants

This study was part of a larger study examining screening procedures in bilingual children (Curtis et al., 2017). Twenty-eight participants, aged 3 to 5 years, met the inclusionary criteria for this study from a pool of 47 children who participated in the larger study. Participants were recruited from local daycares, preschools, Head Start programs, and a university clinic. The inclusionary criteria for

Table 1. Spanish–English Bilingual Participant Characteristics.

N	M age (years;months)	English		Spanish	
		Combined input	Combined output	Combined input	Combined output
28	4;6	51.80 (20.19)	64.92 (33.01)	48.20 (20.19)	35.08 (33.01)

Note. Combined input and combined output percentages in English and Spanish were obtained from the Bilingual Input-Output Survey (Peña et al., 2014). Standard deviations are in parenthesis.

this study included (a) a combined input/output of at least 10% in both English and Spanish, (b) passed a hearing screening in accordance to the American Speech–Language–Hearing Association (ASHA) standards, and (c) completed a language sample in at least one language. The exclusionary criteria included any reported neurological, social-emotional, or cognitive deficits. The 28 participants who met these criteria included 13 males and 15 females with a mean age of 4;6 (ranged from 3;2 to 5;11). Participants presented with relatively balanced language input in both languages with a mean English input of 51.8% and mean Spanish input of 48.2% but higher mean output in English of 64.92% as opposed to Spanish output of 35.08% (see Table 1). The Spanish spoken by participants and their families was characteristic of a Mexican dialect of Spanish. The participants represented a range of bilingual backgrounds with the majority being exposed to English and Spanish since birth. The mean age of first exposure to English was 9.48 months ($SD = 12.36$ months) and the mean age of first exposure to Spanish was 5.52 months ($SD = 11.04$ months).

Procedures

Parent–teacher questionnaire. Parents and teachers completed the *Bilingual Input-Output Survey* (BIOS) questionnaire from the *Bilingual English–Spanish Assessment* (BESA; Peña et al., 2014) to determine their language experience in both English and Spanish. Parent questionnaires were either completed in-person or via telephone by a licensed speech-language pathologist or trained research assistant in the parent’s dominant language. Teacher questionnaires were completed in-person. The amount of current exposure and use for each language (English and Spanish) across home and school were combined to calculate a language input and output for each participant.

Research design and data collection. Participants were individually tested in both English and Spanish following a randomized block research design by trained undergraduate and graduate student research assistants and licensed speech-language pathologists. All the research assistants were bilingual and were supervised by bilingual speech-language pathologists. Every attempt was made for the research assistants to work with the same participant across days of data collection. Participants were aware that the

research assistants were bilingual. Data collection occurred at each participant’s site in a quiet room provided by the school or clinic administrator. All participants were randomly assigned to four different orders of test administration to minimize any practice effect across tasks or languages. As such, language of administration was counterbalanced. As part of the larger study, all participants were administered a language screener, the *Preschool Language Scale–Fifth Edition* (PLS-5), and language sample(s) were collected. Test administration ranged from one to four sessions (average of three sessions) and data collection ranged from 1 day to 5 weeks (average of 2 weeks) due to the participants’ attendances at the different facilities. For the purpose of the current study, participants’ performance on the language samples was analyzed.

Language Samples

Administration and data collection. Language samples were collected from participants using the picture description task described by Eisenberg and Guo (2013) and adapting it to collect samples in both English and Spanish by trained research assistants. Examiners presented a total of seven pictures using a series of four elicitation questions/prompts. The pictures were gathered from children’s books and met the criteria described by Eisenberg and Guo (2013) of having at least three characters in each picture and depicting either a problem in the picture (e.g., a sink overflowing) or the characters participating in different actions (e.g., children playing basketball). Refer to the Appendix for a complete list of pictures.

The participants selected the pictures at random. Once a picture was selected, the examiner followed the prompting procedure described by Eisenberg and Guo (2013) and asked the child about the content of the picture using the following two questions: (a) “What is happening in this picture?” (b) “What else is happening in the picture?” The examiner then presented a picture-specific story starter (e.g., “The kids were playing basketball and then . . .”). Finally, the examiner asked, “tell me one more thing about the picture.” Secondary prompts were used if the child did not respond to a question and the examiner pointed to different areas of the picture to help elicit a response. Examiners gave instructions in the target language and reminded the participants to speak in the target language when needed. If

Table 2. Grammatical Codes.

Code	Code description	Examples
Primary code		
Grammatical	Utterances that were grammatical	
Ungrammatical	Utterances that were ungrammatical	
Secondary code		
Fragments	Utterances that lack a verb	The cake En el fútbol
Argument structure errors	Omissions of obligatory constituents before or after a verb (unless pragmatically appropriate)	And giving him medicine. Agarrando pastel.
Pronominal form errors	Substitution errors for subject, object, reflexive, and possessive pronouns and possessive determiners	Y le salio la niña y la mamá.
Tense marker errors	Omissions and usage errors for copular, auxiliaries, auxiliary <i>do</i> , bound tense markers, and irregular past and third person verb forms, conjugation errors in Spanish	He didn't got an apple. Esta lluvia*viendo.
Grammatical morpheme errors	Omissions or substitutions of a 1. Bound or free nominal morpheme other than pronouns (i.e., plural-s, articles) 2. Aspect markers (i.e., present participle-ing) 3. Prepositions	He's drive*ing the car. Esta quitando la agua.
Other errors	Any other syntactic error or semantic irregularity (i.e., lexical errors on content words like nouns, verbs, and adjectives, and word order).	The doctor is taking him fever. Y luego hacia aqui hace ocho.

a child was not able to respond to the elicitation questions/prompts in the target language on the first picture, the task was discontinued for that language. All participants attempted the language samples in both languages but some responded in the nontarget language even after prompting from the administrator in the target language. As a result, 21 participants produced a language sample in only one language (16 in English and 5 in Spanish) and 7 participants produced language samples in both languages. This resulted in a total of 23 English and 12 Spanish language samples.

The language samples were audio recorded and later transcribed using Systematic Analysis of Language Transcripts (SALT) software (Miller & Iglesias, 2012). Transcripts were coded in SALT for grammatical errors using the error coding described by Eisenberg and Guo (2013) in both English and Spanish. All language samples were transcribed by trained undergraduate and graduate research assistants. Utterances were marked as unintelligible if the transcriber was not able to understand the utterance after three attempts and unintelligible utterances were not coded.

Coding. All complete and intelligible utterances received a primary code for "grammatical" or "ungrammatical." If the utterance was ungrammatical, a second code was then applied to describe the type of error that was made (see Table 2). To ensure accuracy in coding, interrater coding reliability was obtained between two trained transcribers. Transcribers coded 27% of all English transcripts and 37% of all Spanish transcripts independently with interrater reliability in English at 94.3% and Spanish at 95.3%. The

number of total utterances (NTUs) was calculated to ensure that the language samples were comparable between languages. The number of error types was calculated as the independent variables.

Results

Grammatical Error Patterns in Spanish–English (S-E) Bilingual Children

To examine the grammatical errors of 3- to 5-year-old simultaneous bilingual learners descriptive statistics were first conducted to examine the grammatical error types for all English and Spanish language samples (see Table 3). In English, participants produced a higher mean number of fragment errors (English = 4.70, Spanish = 2.75), tense marker errors (E = 6.35, S = 1.00), and grammatical morphemes errors (E = 3.13, S = 1.67) than in Spanish. In the Spanish samples, bilingual children demonstrated more argument structure errors (S = 3.42, E = 2.43) and pronominal form errors (S = 2.08, E = 1.43) than in English.

Error Patterns Across English and Spanish in S-E Bilingual Children

Paired *t* tests were then conducted to compare the English and Spanish errors for the seven participants who produced samples in both languages (see Table 4). To ensure that the English and Spanish samples were comparable, paired *t* tests were conducted for the NTUs and PGUs. There was no statistically significant difference between

Table 3. Means and Standard Deviations of Grammatical Error Types in English-Only and Spanish-Only Young S-E Bilingual Children.

Measure	English (N = 23)		Spanish (N = 12)	
	M	SD	M	SD
Number of total utterances	85.65	40.96	68.17	26.50
Percent grammatical utterances	62.14%	22.06	55.71%	23.08
Fragment error	4.70	5.24	2.75	3.60
Argument structure error	2.43	2.87	3.42	3.53
Pronominal form error	1.43	5.83	2.08	2.15
Tense marker error	6.35	5.80	1.00	0.85
Grammatical morpheme error	3.13	3.70	1.67	1.72
Other error	6.91	8.36	7.25	8.98

Note. S-E = Spanish-English.

Table 4. Paired *t* Tests of Grammatical Error Types in Both English and Spanish (N = 7).

Measure or error type	Mean number of errors				<i>p</i> value
	English		Spanish		
	M	SD	M	SD	
Number of total utterances	70.86	38.37	56.71	6.99	.373
Percent grammatical utterances	57.26%	25.99	66.01%	15.39	.181
Fragment error	4.00	4.32	1.43	1.51	.179
Argument structure error	1.86	1.77	2.14	1.77	.801
Pronominal form error	0.57	1.13	2.71	2.36	.067
Tense marker error	5.57	5.06	0.86	.90	.058
Grammatical morpheme error	3.57	4.72	1.00	1.16	.248
Other errors	6.00	4.08	3.43	2.82	.169

the English (70.86) and Spanish (56.71) transcripts for NTUs, $t(6) = 1.035$, $p = .340$. There was also no statistically significant difference between languages for PGUs, $t(6) = -.626$, $p = .554$, which was 57.26% for the English samples and 66.01% for the Spanish samples. There were no statistically significant differences in error types for fragment errors, $t(6) = 1.523$, $p = .179$; argument structure errors, $t(6) = -0.263$, $p = .801$; grammatical morpheme errors, $t(6) = 1.279$, $p = .248$; and other errors, $t(6) = 1.563$, $p = .169$. Two error types demonstrated a statistical trend ($p < .10$) that should be explored in a larger sample size. Tense marker errors, $t(6) = 2.333$, $p = .058$, demonstrated a statistical trend with more errors in English than in Spanish, and pronominal form errors, $t(6) = -2.228$, $p = .067$, also had a trend with more errors in Spanish than in English.

Discussion

We sought to explore the feasibility of adapting a picture description task (Eisenberg & Guo, 2013) for use with bilingual children. We analyzed the morphosyntactic skills of young bilingual children using these adapted procedures in

both English and Spanish. The results of this study align with findings reported in the literature previously. In English, children exhibited more errors with tense markers and with grammatical morphemes (Bedore & Leonard, 1998; Leonard et al., 1999; Rice & Wexler, 1996). In Spanish, children presented with more errors in pronominal use (Baron et al., 2018; Bedore & Leonard, 2001, 2005). It is interesting to note that the majority of children in our study were not able to produce a language sample in both languages despite the reported exposure and use in both English and Spanish by parents and teachers. The children presented with more difficulty completing language samples in Spanish which could be due to language shift and attrition in L1 (Spanish) as reported in the literature (Gutiérrez-Clellen et al., 2000).

The children who were able to produce a language sample in both languages presented with different errors across languages. Although not statistically significant, trends indicated that in English, children produced more errors with their tense markers. In Spanish, they produced more errors with pronominals. These findings correspond to what other researchers have found (Bedore & Leonard, 2005; Jackson-Maldonado & Maldonado, 2017; Leonard, 1995;

Rice & Wexler, 1996) and highlight the need for clinicians to consider an individual child's grammatical patterns. Different error patterns should be expected in each language (i.e., article errors in Spanish and verb tense errors in English). In addition, it is important to consider the role that age of acquisition for each language as well as exposure to each language plays when assessing bilingual children. In our study, the children had balanced language input in both English and Spanish but presented with stronger language output in English. This likely contributed to their difficulty in producing language samples in both languages and may have influenced the types of errors that were made. In addition, clinicians should consider the possibility that errors in L1 may be a result of the language shift that occurs as children learn L2 (Gutiérrez-Clellen et al., 2000; Sorace, 2004; Schiff-Myers, 1992).

Recommendations for Clinical Use

The adapted picture description task and grammatical analysis shows promise for use with young bilingual children, as it was sensitive to common errors in English and Spanish and may be appropriate for children who speak other languages as well. The use of seven pictures to collect a language sample yielded samples that were appropriate for analyzing PGUs and error patterns in both English and Spanish. We recommend that clinicians follow these procedures described by Eisenberg and Guo (2013) to collect a language sample in both languages. To adapt the task to Spanish or any other language, we recommend the following:

- Translate the prompts from Eisenberg and Guo (2013) to the target language.
 - Prompt 1: What is happening in this picture?
/ ¿Qué está pasando en la foto?
 - Prompt 2: What else is happening in the picture?
/ ¿Qué más está pasando en la foto?
- Use story starters that are specific to the picture and translate in Spanish, for example, "It started to rain and then . . . / Empezo a llover y luego . . ."
- Select pictures that are culturally sensitive to the clinician's population and have at least three characters, depict a problem, or depict characters involved in different actions (i.e., children playing basketball; Eisenberg & Guo, 2013).
- Carefully analyze error patterns observed in the language samples, especially those that have been identified as markers of DLDs in those language(s).
- Determine if the error patterns are consistent with what is described in the literature for any language.

These recommendations allow for a more holistic approach when assessing bilingual populations. Clinicians will be able to consider the possibility of attrition of L1 as

L2 is developing by looking for patterns of errors that would help to differentiate a language difference from a DLD.

Conclusion

A limitation of the study was the small number of children who were able to complete the picture description task in both languages to allow for a direct statistical comparison of English and Spanish performance with a larger sample. This finding was surprising to the authors as parents and teachers reported equal exposure to both English and Spanish overall for the participants. These preschool participants may be developing a preference for one language over the other. It could be that a larger sample size is needed to ensure that a large enough proportion of participants can provide samples in both languages.

The picture description task shows promise as a diagnostic tool with high levels of accuracy for bilingual children as it has with monolingual children (Eisenberg & Guo, 2013). In the current study, none of the children presented with DLDs. Further examination of this task with bilingual children is warranted with a sample that includes children with DLD to further evaluate its use for diagnostic purposes. The current study provides evidence that a picture description task may be a valid tool for use with young bilingual children who may have difficulty with higher level language tasks.

Appendix

Pictures Selected for Picture Description Task

Pictures 1 and 2: Stream / Umbrella (pages 2 and 7)

Source. Adapted from Carr (2001).

Picture 3: Cookie

Source. Adapted from Goodglass et al. (2000).

Picture 4: Sick (Matt and Molly are Waking up)

Source. Adapted from Koski (2012).

Picture 5: Apple picture

Source. Adapted from Langdon (2000).

Picture 6: Basketball (page 2)

Source. Adapted from Prince (2012).

Picture 7: Picnic (page 3)

Source. Adapted from Ward (2012).

Declaration of Conflicting Interests

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