EXAMINING PATTERNS OF CODE-SWITCHING IN PRESCHOOL-AGE SPANISH-ENGLISH BILINGUAL CHILDREN IN FORMAL AND INFORMAL CONTEXTS

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ABSTRACT

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The present study aimed to inform typical bilingual language development by exploring code-switching behaviors in young sequential bilinguals in formal and informal contexts. Data from eight young Spanish-English bilingual children were analyzed to examine the complexity and diversity of code-switched utterances and compare code-switched utterances produced during free play and a story retell. The children code-switched more frequently during free play (informal context) than during the story retell (formal context). Nouns were the syntactic element code-switched most frequently in both conditions. Code-switched words in the role of object were code-switched most frequently during the story retell task whereas code-switched words with the role of the subject were produced most frequently. The findings have clinical implications.

Keywords: code-switching, bilingual, syntactic role, syntactic word types

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Approximately 20% of Americans are bilingual and rely on two or more languages for communication (Mathews, 2019). Of those, 32% are children under the age of 8, who are undergoing active language development (Weyer, 2018). Moreover, in 2014-2015 there were approximately 4,800,000 English Learners enrolled in grades K-12, making up 10% of the student population (U.S. Department of Education, 2014). For bilingual children, unlike their monolingual peers, language development is shaped by use and knowledge of more than one language. Whether a child is learning two languages simultaneously from birth, or sequentially, one language after another, bilingual children experience and receive varying degrees of input from speakers of two languages. This will result in output in both languages (Ribot & Hoff, 2014). Although bilingualism may be defined as having equal proficiency in both languages, this is rare, as language dominance may shift according to environmental context and conversational partner (Bloomfield, 1933; Wei, 2007).

A rule-based phenomenon commonly observed in bilingual individuals who speak different languages is code-switching, also referred to in the literature as code-mixing. *Code-switching* is the act of including linguistic elements from one language into the grammatical framework of another language and can occur within and between sentences (Poplack, 1980) and between dialects or languages (Bail et al., 2015). Code-switching literature on adults has offered insight into relationships between code-switching and bilingual competence. Studies show that code-switching occurs with greater frequency in bilinguals with more balanced proficiency (Bosma & Blom, 2019; Deuchar, 2006; Hartsuiker et al., 2004) and that frequency varies by interlocutors (Brice & Anderson, 1999; Poplack, 1980). This is consistent across studies

irrespective of the languages spoken (i.e., Dutch-Frisian, Welsh-English, Spanish-English). Poplack (1980) found that bilingual adults with more balanced proficiency code-switched between Spanish and English four times more with familiar interlocutors when compared with unfamiliar interlocutors. Moreover, studies show that bilingual adults code-switch between languages even if it occurs at a switching cost, and that when switches are voluntary, bilingual adults prefer one language thereby possibly suggesting a dominant language (Gollan & Ferreira, 2009; Ribot & Hoff, 2014).

While code-switching patterns in adults are somewhat established, much less is known about code-switching patterns in children undergoing development. Work to date has been descriptive in nature and identified variables that may explain the behavior in children. Across studies, children have been observed to use code-switching patterns that are similar to those of their parents, code-switch nouns most frequently, and code-switch more frequently when their level of comprehension is different between the languages (e.g., Brice & Anderson, 1999; Guevara, 2020; Mishina-Mori, 2009). For instance, if a speaker comprehends English less than Spanish, they are more likely to engage in code-switching. Variables shown to influence code-switching include bilingual proficiency (Pfaff, 1979), social factors (Bosma & Blom, 2019), and confusion that may occur due to difficulty differentiating the two languages (Yow et al., 2018). As such, code-switching could be perceived as a problem or indicator of a disorder, if not well understood. Additional descriptive studies are warranted to inform what school practitioners should expect from young bilingual children, so as to not underestimate language ability. While language development is complex and has multiple modalities and aspects (e.g., phonology, semantics, syntax) the aim of the present study is to better understand the syntactic aspect of language in Spanish-English bilingual children. The following sections contain a review of

separate but related literatures to provide the rationale for the present study. First, there is a brief description of bilingualism in children to provide the reader with background knowledge. Next is a description of code-switching and summary of the literature on code-switching in adults and children to better understand the issue, and finally, a discussion of theory to frame the current study.

LITERATURE REVIEW

Bilingualism

Bilingual language development occurs in one of two ways, simultaneously or sequentially, according to the onset or introduction of the second language. Simultaneous bilingualism occurs when a child learns both languages at the same time, rate, and sequence (Shylaja et al., 2011). Children learning languages simultaneously may use both languages more or less frequently. Some tasks and settings may require one language to be used more than the other (Gleason & Ratner, 2013) and this will be different for each child.

Sequential bilingualism occurs when children learn a second language sometime after acquisition of the first language (after 3 or 4 years of age). In the United States, many young children enter school already having acquired a first language then begin systematic exposure to English upon school entry. For these children, grammatical structure usage is somewhat established in the first language prior to introducing the second language (Shylaja et al., 2011). Further, language exposure and amount of input will influence the way children use each language and differ according to communicative contexts. For instance, when parents address children in one language, children will hear that language more frequently than the other language and similarly use that language more frequently (Ribot & Hoff, 2014).

Studies show that age of acquisition can play a role in language proficiency (Bail et al., 2015; Gildersleeve-Neumann et al., 2008). Sequential bilinguals typically have a lower level of proficiency in the second language (Benavides & Schwartz, 2017). Language development is influenced by exposure and experiences in the linguistic environment (Shylaja et al., 2011). Bilingual children experience unique speaking environments in which other interlocutors also have varying degrees of language experience with two or more languages. Knowledge based on

the language development of both languages is essential for understanding how the two languages work together.

Code-Switching

Code-switching is the integration of one language to the phonological, morphological, and syntactic patterns of another language (Poplack, 1980). Studies on the structural component of code-switching aim to describe the grammatical aspects of sentences and identify syntactic constraints for morphosyntactic patterns (Boztepe, 2003; Myers-Scotton, 1993). Code-switching is discussed in the literature in terms of types of switches. The two main types are inter-sentential and intra-sentential. Inter-sentential code-switching occurs between sentences or clauses during conversation, while intra-sentential occurs between languages (Bail et al., 2015; Deuchar, 2006). Inter-sentential code-switching refers to instances in which individuals code-switch multiple words or a sentence in one language while using other sentences and long phrases in another language such as "*El pez está nanando en el agua*. The water is very clear" (Bail et al., 2015). Intra-sentential switches are characterized by phrases or sentences that include two or more languages (Bail et al., 2015). For instance, in the utterance "The fish *está nanando en el agua*", the speaker used both English and Spanish in the same sentence. Intra-sentential code-switching also occurs when multiple languages are included in one utterance, with only one of the languages providing the morphosyntactic frame (Myers-Scotton, 2009). As such, an intra-sentential switch can occur within a production while an inter-sentential switch occurs in conversational boundaries (Forker, 2018). Intra-sentential code-switching may be more difficult for children as it requires faster processing of real-time information (Bail et al., 2015).

Code-Switching in Adults

Studies of code-switching in adult speakers of Spanish-English and Sinhalese-English highlight the a) function of code-switching b) differences between types and frequency of code-switching and c) characteristics of code-switches (Moro, 2015; Myers-Scotton, 1993; Poplack, 1980) Literature on adults who code-switch provides information about typical code-switching patterns and the effect of adult code-switching on the language output of children (Bail et al., 2015). Researchers have also studied the use of intra-sentential and inter-sentential code-switching as it pertains to the syntactic structure of sentences in bilingual adults and found they are produced almost equally.

Poplack (1980) was interested in examining the free morpheme and equivalence constraints in bilingual adults in order to explore rules used when code-switching bound versus free morphemes and found that speakers code-switch free morphemes but not bound morphemes (Poplack, 1980). The equivalence constraint posits that words are only code-switched if they follow the same syntactic rules in both languages (Poplack, 1980). Twenty bilingual Spanish-English speakers with varying proficiency were observed during a naturalistic, intra-group conversation. Language samples were analyzed to determine the extent to which code-switched utterances adhered to the morpheme and equivalences constraints. Results showed there were no instances of grammatically incorrect code-switched sentences between both languages and no switches that occurred following a bound morpheme within the same word. These results were consistent with the free morpheme constraint. Participants were observed to code-switch single nouns (9.5%) the most frequently followed by object noun phrases (7.6%). Words that were code-switched most frequently from Spanish to English were interjections, single nouns, and predicate adjectives. Additionally, participants were observed to use inter- and intra-sentential

code-switches almost equally. Results confirmed that segments in a sentence can be code-switched in both Spanish and English with similar likelihood probability. (Poplack, 1980). According to results in this study, single word switches are the easiest to produce for bilinguals of any level of proficiency.

Bail et al. (2015), examined code-switching behaviors in twenty-four caregivers and their 17 to 24- month- old children during a play session. Results show caregivers were observed to code-switch at least once during the play session. Additionally, over half of the code-switched words contained a determiner and an immediate subsequent noun. The parents tended to repeat utterances six times per dyad ($M = 6.25$, $SD = 10.63$). Intra-sentential code-switches occurred seven times on average and inter-sentential code-switches 25 times. Code-switching occurred in about 15.75% of all utterances. Because code-switching occurs so frequently in this study, it may suggest that bilingual language acquisition is dependent on parents that are using two languages in the home. Parents code-switched inter-sententially more frequently than intra-sententially. Bail et al. (2015), speculated that this may be due to simplification and reduction of language confusion by maintaining the grammatical structure for utterances. Another possibility is the language proficiency of the adult speaker is argued to require a higher mastery level of language for both languages (Bail et al., 2015). Additionally, parents tend to code-switch words as if to translate the previous word or sentence. For example, a parent said “Look! *Mira*! It’s a fishy.” Lastly, findings showed that code-switching occurred most frequently prior to a noun, to act as a determiner, or following an adjective or preposition (Bail et al., 2015).

Results based on these studies provides information on code-switching patterns used by adults. The use and patterns of code-switching among adults with children may be the result of fear of linguistic confusion for young children in terms of processing costs (Bail et al., 2015). Due to this, code-switching patterns may be different in adults and children and processing costs can be inevitable as two languages are being developed at the same time for children (Bail et al.,

2015).

Code-Switching in Children

Studies of typical language development in bilingual children confirm that code-switching occurs even in young children (Bosma & Blom, 2019; Brice & Anderson, 1999; Humran & Shyamala, 2018). By the age of five, children are observed to code-switch similarly to adults as language proficiency increases (Bosma & Blom, 2019). Bilingual children use languages according to pragmatic and sociolinguistic principles, similar to code-switching in adults (Bosma & Blom, 2019).

In a study conducted by Mishina-Mori (2009), specific patterns of code-switching in terms of frequency and relationships between parent code-switching behaviors and child code-switching behaviors is examined. Participants were two Japanese-English bilingual children ages 2;3 (Ken) and 2;5 (Rie). Language samples were obtained in the children's homes during interactions between parents and children while engaged in typical daily life activities. Japanese and English samples were coded for number and type of code-switched utterances. Two hypotheses were tested in this study, the Modeling Hypothesis and the Parental Discourse Hypothesis. If the Modeling Hypothesis held true, parents' code-switching rates would reflect similar code-switching rates of the children. Conversely, if the Parental Discourse Hypothesis were true, then the linguistic patterns and features of adult language would affect the child's use of code-switching as it would be dependent upon the interlocutor's behavior (Mishina-Mori, 2009). Results indicated that Ken's mother used an average code-switching rate of 2.1% (range: 0 - 5.5%) while using Japanese as her primary language. Ken code-switched in a Japanese dominant environment 48.9% of the time (range: 18.3 - 76.7%). At 2;8 Ken used English as his dominant language. For Rie, her mother used 0.3% of code-switched words while utilizing Japanese as the primary language (range: 0 - 2.2%). Rie code-switched in a Japanese dominant

environment with her mother 0.9% of the time (range: 0 - 3.6%). Her father code-switched 0.3% of the time. Rie's code-switching ranged from 2.8 - 14.1% then this frequency decreased significantly when Rie was approximately 3;0 and began to use English as her primary language with her father.

The rates of code-switching between parents and their children cannot be the only factor when considering code-switched patterns. However, this may be one factor when considering code-switched patterns. Language modeling from the parent indicates alignment with the Modeling Hypothesis in some instances but not all. The way in which a child interacts socially such as with peers can also result in different linguistic outcomes in terms of code-switching. This may have played a role in the differences among Ken and Rie and their parents. Mishina-Mori (2009), concludes that patterns of code-switching in children can be relevant to patterns of code-switching used by the individual's parents. However, it does not correlate to all code-switched instances among young bilingual individuals. Although their patterns can show some similarities, this study shows that there are also many other factors and discrepancies to understand before correlating code-switched patterns between parents and their children.

Guevara (2020) explored the relationships between the use of code-switching, fluency, and language use in 15 Spanish-English preschool aged bilingual children (age range: 2;6-3;8). The use of code-switching, participants fluency of speech in both languages, vocabulary, and language proficiency usage were all variables in this study. These measures were collected using the Developmental Vocabulary Assessment for Parents (DVAP) and language samples. Participants were considered Spanish dominant if the DVAP ratio was above 1.25 (five participants), English dominant if the DVAP ratio was below 0.75 (three), and balanced if the ratio was between 0.75 and 1.25 (six). Despite some individuals being Spanish or English

dominant, samples were collected in both languages for all of the participants. These language samples were based on play sessions either in the participant's home or in a clinical setting. Data from the Spanish and English samples were analyzed separately. On average, the proportions of code-switched events were $M = 0.33$ ($SD = 0.29$) in the Spanish samples and $M = 0.01$ ($SD = 0.01$) in the English samples. In the Spanish samples, the results showed a mean of 0.33 with a standard deviation of 0.29 for code-switched events. There were no statistically significant differences between the number of code-switched utterances which include disfluencies and language dominance groups ($H = 2.57$, $p = 0.28$) or the number of words among the individuals who code-switched frequently ($M = 52.29$, $SD = 10.36$), and the individuals who did not code-switch frequently ($M = 49.43$, $SD = 9.07$). A significant negative correlation was found between the number of code-switched words and receptive vocabulary scores from the *Test de Vocabulario en Imagenes Peabody* (TVIP) ($r = -0.76$, $p = 0.28$). Children with a lower frequency of code-switched words in Spanish exhibited higher receptive vocabulary scores than children who code-switched more frequently. Thus, code-switching may be used when receptive vocabulary is lower and therefore, words in the language cannot be retrieved as easily.

The participants' age range and the results of this study show that receptive language skills may play a role in code-switching. Because receptive language plays a large role in the development of expressive language use, the relationship between receptive language skills and code-switching can show the understanding of a language is functional for code-switching output. However, this study does not describe or test the use of receptive language and code-switching in multiple conditions. The play-based samples from this study provide one indication of typical use of code-switching among preschool aged Spanish English bilingual children.

Syntactic Development

There is a consensus that syntactic development begins when children start combining words or produce a one-word phrase or holophrase, to express a targeted adult-like sentence (Lund & Duchan, 1993). It is speculated that during this period of language development, children are unaware of the grammatical meaning encoded in holophrases (Lund & Duchan, 1993). First signs of using more than one meaningful word may be reflective of the child using the same word in different contexts or intonations (Lund & Duchan, 1993). In terms of morphosyntax, bilingual children may have difficulty identifying appropriate verbiage in their second language in sentence structure. Therefore, children will use the other language to compensate for lack of appropriate wording.

For monolingual Spanish-speakers, syntactic knowledge and the use of small sentence fragments appear near age two. Present indicative and verbs such as *ser* and *estar* will also emerge around this age. As these syntactic elements become common in the child's productions, other language domains develop simultaneously. For example, phonological and morphological development occur at the same time during these syntactic development events. Pronouns are used in expressive language at approximately two years of age (Ambridge & Lieven, 2011). Therefore, when children begin to use sentences and formulate appropriate grammatical utterances, lexical knowledge and diversity will also be prominent in the grammatical framework to provide context in the sentence. Generally, when referring to syntax in sentences, auxiliaries, copulas, and modals can be used to identify syntactic elements (Ambridge & Lieven, 2011). Examples of auxiliary words in English are 'be' and 'have' (Ambridge & Lieven, 2011). 'Be' may also be identified as a copula and examples of modals are 'can' and 'should' (Ambridge & Lieven, 2011).

Studies comparing the syntax of bilingual and monolingual children on show differences in scores on grammatical tasks that may be the result of the amount of input in each language (Benavides & Schwartz, 2017; Humran & Shyamala, 2018). Bilingual children tend to receive overall less exposure to one language when multiple languages are presented in their environment (Benavides & Schwartz, 2017). Monolingual speakers receive input in one language at home and school, therefore receiving various grammatical inputs from different environmental settings. Bilingual children receive grammar input from one language in a strict setting.

Theories

Theories can lead to understanding what may be true based on findings and literature relations to theories. Literature shows that theories can be proven through research on specific populations and variables. Theories are used as statements to explain natural phenomenon and used to make predictions based on the environment (Ambridge & Lieven, 2011). When research is completed in a linguistic context, researchers look for the factors that explain why a pattern is occurring. Sociolinguistic theory suggests that social factors affect language use for bilingual individuals (Boztepe, 2003). Patterns and theories on second language acquisition in children can be related to the current study because as code-switching is occurring, children continue to acquire language in specific ways. Theories focused on the syntactic and pragmatic use of language in young children will help understanding of the grammatical and social use of code-switching. Factors that can shape an individual's use of languages include culture, economics, political beliefs, linguistic context, and psychological elements (Shylaja et al., 2011). Social factors that affect language use for bilingual children is a topic has not been researched abundantly.

Finally, the social pragmatic theory of word learning can be broken down into many parts while analyzing the hypotheses posited from the constraints theory and the garden-variety learning theory. These theories focus on learning communication through associations and principles that help individuals to use language (Tomasello, 2000). In contrast, the social-pragmatic theory indicated that language can be learned through social interactions (Tomasello, 2000). Children develop their expressive language and take in the pragmatic cues of the language surrounding them when attempting to make communicative insertions. Additionally, because receptive language development begins before large gains in expressive language development, the use of code-switching would reflect the more expressive dominant language (Ribot & Hoff, 2014).

According to Tomasello (2000), children determine the intention of the conversation based on the communication partner's language and children must understand how the adults or other speakers direct their attention. This kind of understanding begins at a young age, between 9 to 12 months, as joint attention is used to help the child to grow receptive language. Additionally, attention begins in order to make interactions with other interlocutors (Tomasello, 2000). As language is used in the environment during a young age, children begin to pick up on social cues in unison with vocabulary development that might be bombarded during the emerging language period. It should be noted that linguistic and social contexts vary across cultures and can therefore play different roles in language development depending on the culture in which child grew up in. Linguistic symbols are non-speech signals used to direct attention to a specific topic of communication (Tomasello, 2000). The lexical accessibility account posits that bilingual individuals code-switch when there is a more accessible word or phrase in the other language. Additionally, sociolinguistic research indicates that by the age of two, children will

adjust their language based on the speaker and conversational partners (Gross & Kaushanskaya, 2015). If this is true, then the preschool aged bilingual children in the current study will use more formal language in the story retell condition and more casual, code-switched language in the play condition.

Purpose

For preschool-aged sequential bilinguals, exposure to the primary language mainly occurs at home with systematic exposure to the second language occurring upon entry to school. These two environments offer opportunities for children to use language differently based on conversational partners and contexts or conditions within each environment. The preschool classroom environment offers an ideal context to examine code-switching patterns in young children since both formal and informal contexts occur daily. By examining differences in code-switching in different conditions, patterns can be identified and described to better understand typical bilingual development.

Studies of bilingual children indicate that nouns are the most frequently code-switched syntactic element and that words in a subject or object role will be switched more than words serving the role of a verb (Brice & Anderson, 1999; Poplack, 1980). Accordingly, it is hypothesized that children in the current study will code-switch nouns most frequently and words in a subject or object role more than verbs. It is also speculated that there will be limited variability in the number of different code-switched words relative to the total number of code-switched words in both story retell and free play conditions. Given that social pragmatic theory posits children will use and adjust their language based on the pragmatic cues of their conversational partners, it is reasonable to expect that code-switching will differ in the two conditions. If it is the case that the formality of the context influences the number and type of

code-switched utterances, children will produce more code-switched utterances in the informal context relative to the formal context. Since children intake more social cues from adults and other children during free play compared with story retell, differences will likely be observed.

The present study aimed to inform typical bilingual language development by exploring code-switching behaviors in young sequential bilinguals in formal and informal contexts. The following research questions (RQ) were addressed:

RQ1) What syntactic elements, syntactic roles, and vocabulary are code-switched most frequently in the story retell condition of Spanish-English preschool age bilingual children?

RQ2) What syntactic elements, syntactic roles, and vocabulary are code-switched most frequently in the free play condition of Spanish-English preschool age bilingual children?

RQ3) To what extent do syntactic characteristics of code-switched utterances in young Spanish-English preschool age bilingual children differ in a play condition when compared to a story retell condition?

METHOD

Participants

Data from eight Spanish-English sequential bilingual children were analyzed in the present study. Participants were drawn from a larger study on dual language development in preschool (Dubasik & Wilcox, 2013). In the larger study, children were recruited on a volunteer basis from a Head Start grantee school district in the Southwestern USA. The Head Start program included two classrooms of 3-year-old children. To participate in the larger study, children had to be enrolled in a class with exclusively 3-year-olds and attending school for the first time. Additionally, they had to be functionally monolingual Spanish speakers, with Spanish as the primary home language, and have negligible English skills prior to school entry. None of the participants had ever received early intervention or special education services. Participants ranged in age from 51 to 55 months (M = 52.86, SD = 1.77) by the end of the study. All participants were Hispanic of Mexican decent, and of low socioeconomic status as determined by eligibility for Head Start. All participants had typical language development in Spanish as confirmed by parent report and standardized norm-referenced language tests.

To be included in the analyses for the present study participants needed to have completed a story retell and a free play language sample at two time points with inter- or intra-sentential code-switching in at least one sample. Although there were two time points, data from both time points was not a requirement. Instead, children for whom a story retell and a free play sample had been completed were included. The data analyzed in the present study were from eight of the original participants who ranged in age from 43 to 46 months (Dubasik & Wilcox, 2013).

Procedures

Data collection for the larger study occurred at three time points over the course of the school year (Dubasik & Wilcox, 2013). Data were deidentified prior to commencing the present study. Language samples elicited in formal (story retell) and informal (free play) contexts at the beginning and end of the school year were analyzed. A bilingual certified speech-language pathologist elicited Spanish language samples and a trained research assistant elicited the English language samples. Examiners used Spanish or English exclusively to avoid influencing the language used by the children. In compliance with district guidelines stipulating that children could not be removed from the classrooms by persons not employed by the Head Start program, all data were obtained in the preschool classrooms. Language sampling was conducted in one language per day to minimize cross-linguistic contamination. The wordless picture book *Frog, Where Are You*? (Mayer, 1969) was used as the stimuli for the story retell task. Spanish story retells were collected first, followed by English retells. Both occurred in the same week.

Language samples obtained with a story retell task were elicited using a recommended protocol (Miller & Iglesias, 2010). Examiners provided directions, told the story following a script, were engaging, and prompted as needed using acceptable verbal/nonverbal prompts. After using the provided script to tell the story, the examiner handed the book to the child and instructed them to retell the story in the target language prompted by 'Now you tell me the story/Tell me what happened in the story' or '*Dime tú el cuento*/*Dime tú lo que paso en el cuento*.' The microphone and video camera were turned on and children's samples were recorded. To ensure consistent use of acceptable prompts, examiners referenced a list of verbal and nonverbal target language prompts to be used. Language samples were audio/video recorded using an external wireless Bluetooth monaural non-directional microphone transmitter that was

attached to the child's collar or shirt neck and a Sony SR-85 camcorder with attached receiver standing on a tripod facing the child (Dubasik & Wilcox, 2013).

A trained bilingual research assistant with advanced coursework in the field of speech and hearing science orthographically transcribed audio/video files containing the story retells in their entirety. Transcription was completed following a multiple step process. A basic transcription was created in a word document format then converted to a text file. Files were then modified to include Pye Analysis of Language conventions and then modified again to include all standard Spanish conventions for the Systematic Analysis of Language Transcripts Bilingual SE version (Pye, 1987).

Twenty-minute free play language samples were obtained while children played with adults and peers in various centers around the preschool classrooms. Samples were audio and video recorded then transcribed by trained undergraduate and graduate students.

Reliability

The extent of agreement between coders was determined based on 25% of the code-switched utterances produced in the story retell and free-play conditions by all participants. Code-switched words were coded for syntactic element, syntactic role and uniqueness by trained research assistants in Communication Disorders. Instructions were provided to the coders to include: terms identified as syntactic elements, terms identified as syntactic roles, and the details concerning vocabulary items. Coding reliability ranged from 67 – 74%. Code-switched utterances were re-coded following a discussion of discrepancies that were due to confusion in instruction terminology and reliability increased to 90%. Following discussion, all discrepancies were resolved by a fourth coder, and analyses were based on the final coded samples.

Analyses

Language samples were examined to determine the complexity and diversity of children's code-switched utterances in each condition. The number and type of syntactic elements and syntactic roles was tabulated, and a type token analysis was conducted using the number of different/unique code-switched words and the total number of code-switched words. An utterance was any production that expressed a complete thought. The length of the utterances varied and was at least one-word long. Code-switched utterances could be a word, phrase, or complete sentence and were included in the analysis if they either a) contained both Spanish and English, or b) were different from the language used most in the sample.

Data for each participant were organized in a separate Excel spreadsheet. While some participants had larger samples, which meant a larger total number of utterances, only utterances containing code-switched words were numbered, translated, and coded. To examine the complexity and diversity of the code-switched utterances in each condition, several measures were of interest. Complexity measures included the total number of utterances, total number of utterances with code-switched words, number and types of syntactic elements, and number and types of syntactic roles were determined. Each individual code-switched word in an utterance was coded as a/an adjective, adverb, article, conjunction, interjection, noun, pronoun, and verb. Words within multiword utterances were coded for syntactic roles (object, modifier, subject).

Lexical diversity measures included the number of unique code-switched words and the total number of code-switched words. A word was considered unique and counted the first time it occurred in the sample, irrespective of the number of times it occurred. Repetitions, onomatopoeias and "um" were excluded from analyses.

RESULTS

The research questions were answered using a series of frequency analyses conducted with IBM SPSS Statistics (IBM Corp, 2017). Results are organized according to the research question being addressed, and all available data were used. To answer RQ1 and RQ2 the complexity and diversity of code-switched utterances in retell and free-play conditions were analyzed separately, and for RQ3, the results of these analyses were compared using the Wilcoxon signed rank test which is a nonparametric measure that is appropriate for small samples with non-normal distributions.

To answer RQ1, the complexity and diversity of code-switched utterances in the story retell condition were determined. The number of utterances with code-switched words ranged from 0 to 33 for each participant ($M = 9.38$, $SD = 10.66$) and the total number of code-switched utterances analyzed for all participants was 75. In the 75 code-switched utterances across the eight participants, there were 113 individual code-switched words. Of the 113 code-switched words, the syntactic elements code-switched most frequently in the story retell condition were nouns (51.33%), interjections (15.93%) and verbs (10.62%). The remaining 22.11% were adjectives (2.65%), adverbs (3.54%), articles (6.19%), conjunctions (2.65%), prepositions (1.77%) and pronouns (5.31%). Four participants code-switched nouns, three code-switched interjections, and one code-switched verbs most frequently.

Of the 75 code-switched utterances, 71 contained multiple words and could be included in the analysis. The 71 multi-word utterances contained 56 words that were assigned syntactic roles. Code-switched words were mostly the object (60.71%) of the utterance. Words in utterances were a subject or modifier 19 (33.93%) and three times (5.36%), respectively. Two of

eight participants did not code-switch any words that could be assigned a syntactic role. Only one participant code-switched words that could be assigned as modifier. Results for individual participants are shown in Table 1.

In terms of the lexical diversity of code-switched words, participants code-switched a variety of words. The total number of code-switched words across participants ranged from 0 - 48 (M = 14.13, SD = 16.30). The number of unique code-switched words ranged from 0 to 21 (M = 7.38, SD = 6.91). Participants frequently code-switched similar words including *bye*, *dog*, *frog*, *sleeping*, and *basket.* Three participants code-switched *bye* most frequently and *okay* was also among the most frequently code-switched words. Individual participant vocabulary data are shown in Table 2.

To answer RQ2, the complexity and diversity of code-switched utterances in the free play condition was explored. The total number of utterances with code-switched words differed across participants and ranged from 6 to 57 (M = 28.38, SD = 19.15). The total number of code-switched utterances across the eight participants was 225 and the number of code-switched words within these was 399. Of the 225 code-switched utterances included in the analysis, 157 were multi-word combinations. Within the 157 multi-word utterances, 120 words were coded as a/an subject, object, or modifier. In the free play condition, participants mostly code-switched words that were the subject of the utterance (52.50%). Code-switched words also were the object (40.00%) of the utterance or modifier (7.50%). Three of eight participants code-switched words most frequently that served in the object role and three code-switched words in the subject role. Two of eight participants code-switched words in the object and subject syntactic roles equally. Results for individual participants are shown in Table 3.

Of the 399 code-switched words across participants in the free play condition, most were nouns, pronouns, and verbs occurring 132, 79, and 64, respectively. Three of eight participants code-switched nouns, three pronouns, one interjection, and one participant code-switched prepositions most frequently. Participants code-switched a variety of words. The analysis to examine lexical diversity was based on total number of code-switched words and number of different code-switched words. The total number of code-switched words across participants ranged from 11 to 143 (M = 49.88, SD = 43.85). The number of different code-switched words ranged from 10 to 70 (M = 27.63, SD = 20.05). Many participants consistently code-switched some words and also code-switched the same word multiple times (e.g., *hey*, *frog*, and *yeah*). For instance, three participants code-switched *hey* the most out of all of the words code-switched. Individual participant vocabulary data are shown in Table 4.

RQ3 addressed code-switching differences across the two conditions. The total number of code-switched utterances produced in the two conditions differed, with children code-switching more during free play than while retelling a story. The total number of utterances in the free play condition ranged from 44 to 242, (M = 177.00, SD = 69.17), and 68 to 181, (M = 116.13, SD = 39.39) during the story retell. In the free play condition, children code-switched in approximately 15.92% their utterances on average. The proportion of code-switched utterances for each child ranged from 5.86% to 25.81% of the total utterances. In comparison, approximately 6.81% of children's utterances were code-switched in the story retell condition with one child not code-switching at all (0%) and another child code-switching over 18.23% of their utterances. The number of code-switched words was also greater in the free play condition relative to the story retell. On average, participants code-switched 49.88 (SD = 43.85) and 14.13 (SD = 16.30), respectively.

The total number of syntactic elements (M = 7.13, SD = 1.46), total number of code-switched words assigned syntactic roles (M = 15.00, SD = 13.07), and the total number of different/unique words (M = 27.63, SD = 20.05) in the free play condition were higher than in the story retell condition M = 3.00, SD = 2.27, M = 7.00, SD = 13.59, M = 7.38, SD = 6.91, respectively. Children code-switched nouns and verbs similarly. Nouns were the most frequent syntactic element that was code-switched and verbs was the third in both conditions. The second most frequently code-switched words differed between the conditions. In the retell condition they code-switched interjections and in free play they code-switched pronouns.

During free play all participants code-switched words that were the subject of the utterance whereas four of eight code-switched words that were the subject. Words in the object role of the utterances were code-switched more in the story retell condition while the subject of the utterance was code-switched more during free play. However, the total number of occurrences that object was identified as a syntactic role was more frequent in the free play condition with 48 of 120 code-switched words compared to 34 of 56. During free play, children code-switched words in the subject role most often and code-switched objects most often during story retell. For objects, in the story retell, participants code-switched words for about 60% of the total syntactic roles.

Three participants consistently code-switched the same syntactic element (noun, interjection, noun) most frequently in both the story retell and free play condition. A similar pattern was observed with three participants code-switching words in the same syntactic role (object, subject) most frequently in both conditions. One of eight participants code-switched the same vocabulary word (*frog*) most frequently in both conditions. A Wilcoxon test was used to evaluate mean differences in the number of utterances with code-switched words, the total

number of code-switched words, the number of different/unique code-switched words, and total number of syntactic elements in the conditions. On average, children used statistically significantly more code-switched words overall in the free play condition ($z = 2.52$ and $p = 0.01$). Additionally, children code-switched more words and more unique words during play relative to retelling a story ($z = 2.38$ and $p = 0.02$, $z = 2.32$ and $p = 0.02$).

DISCUSSION

The purpose of this study was to gain a better understanding about the complexity and diversity of code-switched utterances in young Spanish-English speakers and determine if code-switching patterns differed in formal and informal contexts. This work contributes to a growing body of evidence on code-switching patterns in young bilingual children and offers new insight into differences in code-switching patterns as a function of context. Children in the present study were recorded while playing with their peers and teachers and also while retelling a story. Analyzing code-switching patterns in two different contexts allowed for a comparison.

Children in the present study talked more during play than while retelling a story. This was evidenced by comparing the total number of utterances produced during the informal and formal contexts. One possible explanation for this difference might be the familiarity of the interlocutor. During free play, children were talking to peers and teachers who were known communication partners and during the story retell, they were talking to an unfamiliar partner. Additionally, children may have also felt more comfortable in the classroom than they did at the table outside of the classroom. These results are not surprising and can be explained by social pragmatic theory which posits that children will use and adjust their language based on pragmatic cues of conversational partners.

While retelling a story, children produced nouns at least three times more than any other syntactic word type. However, only six children code-switched nouns while seven code-switched interjections. The most common interjections used during the story retell were *hey* and *bye,* which are words found in the English language that can also be used by Spanish speakers but are

pronounced differently. It was not surprising that children produced nouns most frequently since this is the earliest syntactic element acquired in both Spanish and English. Additionally, nouns emerge early during language development. As children begin to talk more, they will use their current lexicon and continue to produce nouns but in more complex sentences. This kind of language development is essential for school children who begin to use more formal language such as during a story retell task. Regarding syntactic roles, only one child produced a code-switched word in the modifier role, and was the only participant who produced subject, object, and modifier in this condition. The same participant also produced the largest number of utterances and code-switched words. This provides evidence on one participants' code-switching patterns. By coding syntactic roles, information is gained on complete grammatical sentences on young bilingual children. For example, children who code-switch words in utterances that contain all three roles produce a more complete grammatical utterance compared to producing only the subject of an utterance. Therefore, there is more information gained on the output of the utterance. Overall, children spoke less while retelling a story, therefore there was less information about how they used roles and types in the formal context relative to the informal context.

Children talked more during interactive play and therefore, produced more multi-word code-switched utterances that contained information about language word types and roles. For example, code-switched nouns and interjections were produced by all participants and accounted for almost half of the code-switched words. However, in this condition, participants code-switched pronouns and verbs more frequently than interjections. One possible explanation for this was the larger total number of utterances produced. In a larger number of utterances, there were more opportunities to produce a larger variety of code-switched word types in different

roles. While playing, children code-switched more and produced more multi-word utterances. This resulted in more instances of syntactic role assignments. In this condition, four participants code-switched all roles (subject, object, modifier). This suggests that informal contexts may yield more syntactic information about code-switching patterns in young bilingual children than samples obtained in formal contexts.

Although there were overall greater instances of code-switching during play than while retelling a story, there were several instances in which retelling a story offered insight into patterns of code-switching. There were three word types in which the proportion of the type of code-switched word was greater when children retold a story (nouns, interjections, and conjunctions), than when children were playing. Similarly, the code-switched words in the object role were greater proportionately while retelling a story. All proportions were based on the total number of code-switched utterances. While the proportions were lower for some of the code-switched word types and roles in the free play condition, there were still greater variety code-switched words of all types and roles during play except for conjunctions. If a professional wanted to know about the code-switched nouns used by a young bilingual child, they might elicit a sample in a formal context in order to obtain a large number of nouns. However, if overall language use was of interest, specifically with code-switched word types and roles, an informal context might be more appropriate.

The results of the present study are consistent with previous work that identified nouns as the most frequently code-switched syntactic element for both children and adults (Brice & Anderson, 1999; Poplack, 1980). The present study expands upon previous work by comparing code-switching patterns in a formal and informal context. Two children in the present study were fraternal twins. While not a focus of this study, the code-switching patterns of the twins warrant

some discussion. The twins code-switched similar syntactic elements during play and retelling a story. Additionally, they code-switched similar syntactic roles while retelling a story but different roles during play. One twin code-switched words in the object role most frequently and the other did not code-switch words in the object role at all. This is interesting since the twins received similar input from adults in the environment and had similar language experiences. Future studies might consider examining code-switching patterns in twins to determine the extent to which parental code-switching is related to code-switching in children.

The observed differences across participants suggests that patterns of code-switching in young children are context dependent. Tomasello, (2000) found that bilingual individuals code-switch when there is a more accessible word or phrase in the other language. Results from the current study show that bilingual children tend to code-switch the same words throughout a sample rather than a large number of unique words. It was beyond the scope of this study to address accessibility of words. However, producing the same code-switched word throughout the sample provides emerging evidence that code-switching may be influenced by accessibility in that words that are more easily accessible are code-switched more often.

The present study is not without limitations. First, data from a small number of children were analyzed. As such, results are not generalizable to all young Spanish-English bilinguals. It is possible that with a larger sample, similar results may not be observed. Second, the number of utterances analyzed differed in the formal and informal conditions. As such, the average proportion of code-switched words was computed for each child and the mean proportion was reported in order to address the unequal sample sizes. An equal sample size might yield different results overall. Future studies might extend the current findings by examining code-switching patterns in different contexts with older bilingual children. Additionally, it might be interesting

to determine whether proficiency or condition is a better predictor of how often children code-switch. Despite the limitations, results of the present study have several clinical implications. Children in the present study code-switched differently during free play than they did while retelling a story. Professionals who work with young bilingual children should use this finding to determine the most appropriate context for eliciting samples in order to evaluate the typical language patterns of bilingual children.

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APPENDIX A. TABLES

Table 1

Individual Participant Results for the Story Retell Condition

Participant	Most Frequent Syntactic Element	Number of occurrences (Syntactic Element)[a]	Most Frequent Syntactic Role	Number of Occurrences (Syntactic Role)[b]
1	Noun	37/48 (77%)	Object	27/40 (67.5%)
2	Interjection	2/3 (66.67%)	Object	1/1 (100%)
3	Noun	7/9 (77.78%)	Object	1/1 (100%)
4	Noun	3/6 (50%)	Subject	3/3 (100%)
5	-	-	-	-
6	Interjection	3/3 (100%)	-	-
7	Verb	8/27 (29.63%)	Subject	2/3 (66.67%)
8	Noun	7/17 (41.18%)	Object	4/8 (50%)

Note. This table demonstrates the most frequent syntactic element and syntactic role produced by each participant in the story retell condition.
[a] In the syntactic element number of occurrences column, the denominator represents the total number of code-switched words produced by the participant.
[b] In the syntactic role number of occurrences column, the denominator represents the total number of code-switched words that could be coded as a syntactic role by the participant.

Table 2

Individual Participant Vocabulary Results for the Story Retell Condition

Participant	Most frequent code-switched word(s)	Number of occurrences
1	Frog	26/48 (54.17%)
2	Ok, stickers, goodbye	1/3 (33.33)
3	Baby, goodbye, bye, one, two, three, five, seven, eight	1/9 (11.11%)
4	Dog	3/6 (50%)
5	-	-
6	Bye	2/3 (66.67%)
7	Se	3/27 (11.11%)
8	Bye	5/17 (29.41%)

Note. This table demonstrates the most frequent code-switched word produced by each participant in the story retell condition.
[a] The denominator in the number of occurrences column represents the total number of code-switched words produced by each participant in the story retell condition.

Table 3

Individual Participant Results for the Free Play Condition

Participant	Most Frequent Syntactic Element	Number of occurrences (Syntactic Element)[a]	Most Frequent Syntactic Role	Number of Occurrences (Syntactic Role)[b]
1	Noun	48/77 (62.34%)	Object	16/29 (55.17%)
2	Interjection	11/22 (50%)	Subject	4/5 (80%)
3	Noun	12/24 (50%)	Object	4/8 (50%)
4	Pronoun	37/143 (25.87%)	Subject	29/40 (72.50%)
5	Preposition	4/11 (36.36%)	Subject	1/1 (100%)
6	Pronoun	14/61 (22.95)	Object	6/13 (46.15%)
7	Noun	7/20 (35%)	Object/Subject	5/10 (50%)
8	Pronoun	11/41 (26.83%)	Object/Subject	7/14 (50%)

Note. This table demonstrates the most frequent syntactic element and syntactic role produced by each participant in the free play condition.
[a] In the syntactic element number of occurrences column, the denominator represents the total number of code-switched words produced by the participant.
[b] In the syntactic role number of occurrences column, the denominator represents the total number of code-switched words that could be coded as a syntactic role by the participant.

Table 4

Individual Participant Vocabulary Results for the Free Play Condition

Participant	Most frequent code-switched word(s)	Number of occurrences
1	Frog	10/77 (12.99%)
2	Hey	8/22 (36.36%)
3	Hey	6/24 (25%)
4	Este, mi, no, quiero	7/143 (4.90%)
5	There	2/11 (18.18%)
6	Hey	7/61 (11.48%)
7	This	4/20 (20%)
8	Yeah	4/41 (9.76%)

Note. This table demonstrates the most frequent code-switch word produced by each participant in the free play condition.
[a] The denominator in the number of occurrences column represents the total number of code-switched words produced by each participant in the free play condition.