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Code Switching by Bilinguals: Evidence Against a Third Grammar[1]

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Bilingual code switching within sentences (as in "The towel roja *was dirty") is often observed in bilingual communities. The present study addressed two issues. First, what is the nature of the grammatical rules that underlie code switching? Second, how do bilingual speakers acquire such rules? We addressed the first issue by obtaining judgments of the grammaticality of four types of sentences containing code-switched words. Judgments of acceptability seemed to be based on two rules: (1) Code switching can occur only when the code-switched words are positioned in accord with the rules for which they are appropriate lexical items; (2) code switching within word boundaries is considered ungrammatical. We addressed the second issue by exploring the effects of age and code switching experience on the grammatical judgments of bilingual children and adults. Extensive code-switching experience did not seem to be necessary for bilingual speakers to know the grammatical constraints of code switching. This suggests that the constraints of code switching are based on the integration of the grammars of the two code-switched languages rather than on the creation of a third grammar. There were developmental changes in the judgments made to the sentences. All aged subjects found sentences that violated the word-order rule (1 above) unacceptable. However, the youngest children (8- to 10-year-olds) found mixing within a word acceptable. This developmental change could be due to a change in the grammar of code switching, in the ability to make metalinguistic judgments, or in the child's general knowledge about the nature of languages.*

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In many stable bilingual communities people will frequently use two languages within a single sentence when speaking to other members of the community (e.g., "*Andamos* horseback riding"). This phenomenon, referred to as code switching or code mixing, is distinct from linguistic borrowing, which is usually defined as the integration of words derived from one language into the lexicon of a second language (Bentahila & Davies, 1983; Gumperz, 1977; Poplack, 1980). *Savoir-faire, tête-à-tête* and *grande dame* are some examples of borrowed words frequently used in the United States. Borrowed words, unlike code-switched words, are phonologically and morphologically adapted to the second language's rule system. Since in such cases the word is viewed as part of the lexicon of the second language by the speaker, linguistic borrowing is not actually a case of alternation between two languages. Unlike code switching, linguistic borrowing occurs in the speech of monolingual as well as bilingual speakers of the community.

Code switching is common in the United States among Mexican-Americans and Puerto Rican-Americans (Pfaff, 1979; Poplack, 1980). It also has been observed in bilingual communities in India, Austria (Gumperz, 1977), and Morocco (Bentahila & Davies, 1983). The most common type of intrasentential code switch is the insertion of a single lexical item from one language, usually a noun, into a sentence composed of words from the other language (e.g., "*Yo miro dos* puzzles"; McClure & McClure, 1975). Code switching can also occur between clauses in a sentence (e.g., "*Su cabello va ser* this color"; McClure & McClure, 1975).

Research indicates that many situational variables affect the frequency with which code switching occurs (Gumperz, 1977; McClure, 1977). For instance code switching is affected by the topic of conversation (e.g., talking about family matters vs. government), who is participating in the conversation (their linguistic abilities, social status, and so forth), the setting (home vs. school or work), and the affective message the speaker is trying to convey (Gumperz, 1977). Since these effects are systematic, researchers have hypothesized that speakers in these bilingual communities know a system of sociolinguistic rules that governs their behavior (Gumperz, 1977; McClure & McClure, 1975).

In addition to being governed by sociolinguistic rules, code switching seems to be subject to grammatical rules. Analysis of spontaneous speech and elicited imitations shows that there are regular patterns in the placement of a code switch within a sentence (Wentz & McClure, 1976; Pfaff, 1979; Poplack, 1980). In addition, when asked to judge the grammaticality of mixed sentences, adults consistently accept some sen-

tences while rejecting others (Aguirre, 1980; Gingras, 1974; Gumperz, 1977; Timm, 1975). The present study will address two issues concerning the grammatical rules of code switching: What are the grammatical rules of code switching? How are these rules acquired? We will discuss each of these issues in turn.

Although research clearly indicates that code switching is governed by grammatical rules, the level of generality of these rules is in dispute. Initial research that elicited acceptability judgments from bilingual adults indicated that some construction-specific constraints operate on code switching. Some often-cited constraints include the following:

1. Switching cannot occur between auxiliary and verb (e.g., "*I must *experar*"; Timm, 1975), between verb and infinitival complement (e.g., "*Quieren to come"; Timm, 1975), or between pronominal subjects and finite verbs (e.g., "**Yo* went" Timm, 1975).

2. Conjunctions must be in the same language as the following clause (e.g., "*I was reading a book and *ella estaba trabajando*"; Gumperz, 1977). Possessive pronouns must be in the same language as the preceding clause (e.g., "**Dame* your raincoat, it's raining outside"; Aguirre, 1980).

3. Switching can occur between an adjective and a noun only if the adjective is placed in accord with the rule for the language of the adjective (e.g., "*I want a *verde* motorcycle"; McClure, 1977).

In contrast to these construction-specific rules, researchers who have examined the spontaneous code switching of Hispanic-Americans have hypothesized that code switching is constrained by some interconstruction rules working in conjunction with the rules of the individual languages. Two interconstruction rules proposed by several researchers are as follows:

1. Code switching cannot occur between a free and a bound morpheme (Bentahila & Davies, 1983; Pfaff, 1979; Poplack, 1980; Wentz & McClure, 1976). For example, a switch could not occur between a base verb and a tense suffix, such as **eatiendo*.

2. Code switching will tend to occur in places where the surface structures of the two languages are equivalent (Lipski, 1978; Pfaff, 1979; Poplack, 1980). Thus, for example, any switches within a complex noun phrase when one language has a prenoun placement rule for adjectives (e.g., English) and the other language has a postnoun adjective placement rule (e.g., Spanish) would be considered ungrammatical. In addition, switches should not occur between indirect pronominal objects and verbs when placement of the pronoun is different in the two languages, as is the case in English and Spanish.

The proposed construction-specific rules are not just subrules of the inter construction rules. Some code switches allowed by the specific rules (e.g., mixed noun phrases) would be considered ungrammatical under the interconstruction rules, while others restricted by the specific rules (e.g., switches between auxiliary and verb) would be considered acceptable under the interconstruction rules. On the basis of the existing research, it is not possible to determine which view of code-switching grammar is the correct one. The studies that elicited grammatical judgments are limited in terms of both the number of subjects and the exemplars of a specific rule that the subjects judged (Aguirre, 1980; Gingras, 1974; Timm, 1975). Thus, many of the proposed specific constraints may really be idiosyncratic to a small number of subjects or exemplars of the construction. In fact, sufficient numbers of code-switched sentences that violate specific rules listed in 1 and 2 above were found in spontaneous speech (Pfaff, 1979; Poplack, 1980) to suggest that these constraints do not exist. However, determining that a particular construction is ungrammatical (e.g., mixed noun phrases or mixed words) on the basis of analyses of spontaneous speech is questionable because of sampling problems, especially of such a low-incidence linguistic phenomenon as code switching.

One goal of the present study was to determine if code switching is governed by the two interconstruction rules proposed by Poplack (1980) and Pfaff (1979). A grammatical judgment task was used in order to provide a more extensive data base from which to determine the rules of code switching. Four types of code-switching constructions were tested. Two constructions were ungrammatical constructions according to the two general rules: mixed noun phrase sentences containing adjectives that belong in postnoun position in Spanish and prenoun position in English and mixed verb sentences in which the language of the root verb and inflection differed. Two constructions were grammatical according to these rules: mixed noun phrase sentences containing adjectives that belong in prenoun position in both English and Spanish and mixed verb phrase sentences in which the language of the auxiliary and main verb differed. If code switching is governed by the two interconstruction rules, subjects should reject the first two constructions and accept the last two.

A second purpose of this study was to address the question: How do speakers know the grammatical constraints that govern code switching? Three alternative hypotheses have been proposed by past researchers. Some researchers have argued that speakers learn these constraints from being exposed to the code-switching behavior of other members of the

community (Aguirre, 1980; Gingras, 1974; Wentz, 1977). In other words, a grammar of code switching is acquired in much the same way as a person acquires the grammar of a language: by observing the regularities of the code-switching behavior of adults in the community. Alternatively, Pfaff (1979) has proposed that there is no third grammar of code switching. Rather, the rules of code switching are based on knowing the linguistic rules of the two code-switched languages, along with some functional and syntactic constraints that are part of every speaker's general linguistic knowledge. Thus, according to this view, if one knows the grammars of both languages, one knows the grammatical constraints of code switching. Finally, Poplack (1980) has argued that the grammar of code switching is based on the systematic integration of the separate grammars of the code-switched languages into a third grammar. A high level of competency (i.e., balanced bilingualism) is required, she asserts, for such integration to occur.

The present study addressed this issue by testing the effect of three variables (age, exposure to code switching, and degree of bilingualism) on the grammatical judgments of code-switched sentences. To test for the effect of age, the code-switching rules of bilingual speakers aged 8 through 43 years were examined. Developmental changes in the rules of code switching after the two code-switched languages are acquired would suggest that the grammar of code switching is learned. This hypothesis does not receive much support from the existing research. Although there are developmental changes in the amount children code-switch (McClure, 1977), in the type of code switching that predominates (McClure, 1977), and in the situations that elict code-switching behavior (Genishi, 1981), these types of changes are probably due to the acquisition of new sociolinguistic rules rather than grammatical rules. Indeed, the examples given in studies of children's code switching (Huerta, 1977; Wentz & McClure, 1976) show the same grammatical characteristics of adults' code-switched sentences. The present study systematically tested the hypothesis that there are no developmental changes in code-switching grammar.

To test for an effect of code-switching experience, we compared the grammatical intuitions of adults who grew up in a code-switching environment with the intuitions of adult bilinguals who did not have extensive experience with code switching. If the grammatical rules of code switching are learned from others who code-switch, only the former group of subjects should be able to make systematic judgments of code-switched sentences. Gingras (1974) and Poplack (1980) tested the related

hypothesis that only bilinguals exposed to code switching prior to puberty learn the grammatical rules of code switching. Their findings indicate that exposure to code switching significantly affects code-switching behavior. Bilingual Puerto Ricans who emigrated to New York before puberty spontaneously code-switch at a much higher rate than those who emigrated after puberty (Poplack, 1980). In addition, while Mexican-Americans born in the United States consistently judge some code-switched constructions as acceptable and others as unacceptable, bilingual Mexicans who moved to the United States as adults judge all code-switched sentences as unacceptable (Gingras, 1974). Gingras (1974) interprets these results as supporting the learning hypothesis. However, time of exposure to code switching may be a crucial factor in mitigating the social stigma of code switching and thus affecting code-switching behavior rather than affecting grammatical knowledge. In support of this hypothesis, although no analysis was reported, Poplack (1980) suggests that despite large differences in the amount of code-switching behavior, there were no group differences in the grammatical constraints of code switching. The present study was designed to test differences in grammatical knowledge independent of variation due to differences in the subjects' sociolinguistic rules. The grammatical judgment task used in this study forced subjects to decide on "the most acceptable way to code-switch" even if they felt that all code switching was socially unacceptable.

Finally, a test of language dominance was administered to the children participating in this study in order to ensure that any developmental changes that occurred were not due to changes in language dominance and to test the hypothesis that only balanced bilinguals know the grammar of code switching (Aguirre, 1980; Poplack, 1980). Since in previous research there had been no significant differences in the grammatical judgments of balanced bilinguals, Spanish-dominant bilinguals, and English-dominant bilinguals (Aguirre, 1980; Poplack, 1980), it was not expected that language dominance would significantly affect the subjects' grammatical intuitions.

To summarize, the present study had two major purposes: (1) to determine if the linguistic rules of code switching are of a construction-specific or interconstructive nature by systematically eliciting grammatical judgments from 75 subjects; (2) to test the hypothesis that the grammar of code switching is learned through exposure to code switching by examining the effect of age, experience, and language dominance on judgments containing code switching.

METHOD

Subjects

Fifteen second- and third-grade (range = 8 years 6 months to 10 years, M = 8 years 11 months), 15 third- and fourth-grade (range = 9 years 8 months to 11 years 6 months, M = 10 years 6 months), 15 seventh- and eighth-grade (range = 12 years 2 months to 13 years 5 months, M = 12 years 10 months) and 15 adult Mexican-Americans (range = 18 years 6 months to 43 years 8 months, M = 27 years 6 months) participated in the study. All Mexican-American subjects were born in the United States or had moved to the United States before the age of 2 years. The children attended a Catholic parochial school in a Mexican-American area of Dallas, Texas.

Fifteen Spanish-English bilingual adults (range = 28 years 3 months to 35 years 2 months, M = 33 years 3 months) who reported that they did not code-switch or have regular contact with Mexican-Americans also participated in the study. These subjects were born in a Spanish-speaking country (Mexico, Colombia, or Peru) and had moved to the United States as adults. All were functioning well in an English-speaking environment.

All subjects were judged to be bilingual by the researchers. The adults were acquaintances of the researchers who were able to converse in both English and Spanish. All children were defined by their teachers as bilingual. In addition, any child who could not converse in both English and Spanish during the initial phase of the experimental session was not used in the study.

Procedure

The experimental session began with an informal interview. The interview had three purposes. First, information was elicited about each individual's language background, attitudes, and contact with code switching. Second, the researcher used the interview to ensure that all individuals were able to converse in both Spanish and English. Third, the acceptance of code switching by the researcher was communicated to the subject. To accomplish this goal, the researcher constantly code-switched between English and Spanish during the interview and the subsequent experiment.

Following the interview, the children were given a pretest to determine their ability to make grammatical judgments. The pretest con-

sisted of eight unilingual Spanish sentences and eight unilingual English sentences presented in a random order. All sentences contained a complex noun phrase in subjectival position. In half the sentences the adjective in this noun phrase was placed in the wrong position (that is, prenoun for Spanish adjectives, postnoun for English adjectives; e.g., "The cat black jumped over the fence"). The children were asked to decide whether each sentence was acceptable and to correct unacceptable ones. To pass the pretest, the children had to correctly judge at least six out of eight English sentences *or* six out of eight Spanish sentences. The six correct judgments had to include the acceptance of three grammatical sentences and the rejection of three ungrammatical sentences. Pilot testing indicated that second-graders were the youngest children able to accomplish this task. This is consistent with the developmental trends found in other research that has elicited acceptability judgments of deviant word order sentences from children (Saywitz & Wilkinson, 1982).

The experimental session immediately followed the interview for the adult subjects and the pretest for those children who reached criterion. The subjects were told: "I have several sentences here. *Todas tienen inglés y español* [all of them have English and Spanish] in the same sentence. *Yo te las voy a leer y tu me vas a decir* [I am going to read them to you and you are going to tell me] if they are right or wrong. *Si una está mal, quiero que la cambies* [If one of them is wrong, I want you to change it], but keeping the two languages in it. *Como cuando una habla mixteado'* [As when we speak 'mixteado']. Any questions?" Pilot testing indicated that the instruction to keep both languages in corrected sentences was necessary to force all subjects to make their judgments of grammaticality based on the type of code switching that occurred in the sentences rather than on code switching per se. The entire experimental session was tape-recorded and later transcribed.

The experimental task consisted of presenting to the subject 72 sentences that were designed to determine the grammatical rules for sentences containing mixed noun phrases, mixed verb phrases, and mixed verbs. The sentences were presented to all subjects individually in a single session, with the exception of the youngest children. The experimental task was divided in half for the second- and third-graders and was given to them on 2 consecutive days. The sentences were presented in a random order, with the stipulation that half of the sentences representing the different types of code-switched sentences were in the first half of the task. Table I illustrates the 20 types of sentences in the task. These sentences are described below.

Table I. Examples of Sentences Used in This Study

1. Mixed noun phrases sentences
   a. The towel *roja* was dirty. (. . . RED . . .)
   b. *El* ship *grande cruzo el mar.* (THE . . . BIG CROSSED THE SEA.)
   c. The *enojado* man slammed the door. (. . . MAD . . .)
   d. *La bonita* queen *entró al palacio.* (THE PRETTY . . . WENT INTO THE PALACE.)
   e. *El* broken *dedo me dolía mucho.* (MY . . . FINGER HURT A LOT.)
   f. A bright *estrella* appeared in the sky. (. . . STAR . . .)
   g. *La muchacha* sad *estaba llorando.* (THE GIRL . . . WAS CRYING.)
   h. That *arbol* green is an oak. (. . . TREE . . .)

2. Exceptional mixed noun phrase sentences
   a. *El primer* month *del año es enero.* (THE FIRST . . . OF THE YEAR IS JANUARY.) (correct position)
   b. *Mi* birthday *mejor fue el año pasado.* (MY . . . BEST WAS LAST YEAR.) (incorrect position)
   c. The best *escuela* in town is ours. (. . . SCHOOL . . .)
   d. The *invierno* worst in many years was last winter. (. . . WINTER . . .)

3. Mixed verb phrase sentences
   a. *Nosotros* have *visitado la feria.* (WE . . . VISITED THE FAIR.)
   b. I have *visto* Popeye on TV. (. . . SEEN . . .)
   c. Pepito *había eaten all the candy (. . . HAD . . .)*
   d. *El tigre no había* escaped *de su jaula.* (THE TIGER HAD NOT . . . FROM HIS CAGE.)

4. Mixed verb sentences
   a. Juanito *estaba* play*endo con sus monitos.* (JUANITO WAS PLAYING WITH HIS TOYS.)
   b. The teacher was practic*iendo* her speech. (. ING . . .)
   c. *Mi tío estaba escrib*ing *una cart*a. (MY UNCLE WAS WRITING A LETTER.)
   d. The boy was *aprend*ing how to read. (. . . LEARN . . .)
   e. The dog *nad*ed to the other side of the pool (. . . SWAM . . .)
   f. Las niñas habled *mucho en la clase.* (THE CHILDREN TALKED A LOT IN THE CLASS.)
   g. The puppie drink*aba* the milk. (. . . DRANK . . .)
   h. *El caballo* jump*aba la cerca.* (THE HORSE JUMPED THE FENCE.)

Thirty-two "regular mixed noun phrase" sentences contained a complex noun phrase in subjectival position in which the language of the adjective and noun differed. In these sentences the adjective belonged in postnoun position in Spanish but prenoun position in English. The effect of three variables on the acceptability of these sentences was tested: the language of the adjective and thus of the noun (Spanish vs. English),

the position of the adjective (prenoun vs. postnoun), and the language of the rest of the sentence (Spanish vs. English). The crossing of these three variables factorially produced eight different sentence types (sentences 1a through 1h of Table I).

Sixteen "exceptional mixed noun phrase" sentences contained adjectives that belong in prenoun position in Spanish and thus were exceptions to the normal Spanish placement rule. For these sentences there was no conflict between the English and Spanish placement rules. The language of the adjective and the position of the adjective was varied factorially in these sentences (sentences 2a through 2d of Table I).

Eight "mixed verb phrase" sentences contained a complex verb phrase in which the language of the auxiliary (*to have* or *haber*) and verb differed. The language of the auxiliary (and thus the verb) and the language of the rest of the sentence were varied factorially in these sentences (sentences 3a through 3d of Table I).

Sixteen "mixed verb" sentences contained verbs in which the language of the stem of the main verb and the language of the inflection differed. The language of the inflection (and thus root verb), the type of inflection (past tense vs. present indicative), and the language of the rest of the sentence was varied factorially in these sentences (sentences 4a through 4h of Table I).

On the week following the test session the children were given the Oral Language Dominance Test.

RESULTS

Grammatical Rules of Code Switching

The effect of the sentence characteristics on the acceptability judgments of the Mexican-American adults was analyzed first in order to describe the "mature" acceptability rules. To test for construction-specific rules, analyses were performed for each construction. To test for interconstruction rules, the acceptance rate of the different constructions was compared.

Mixed Noun Phrase Sentences

The acceptability judgments of the regular mixed noun phrase sentences were analyzed using a 2(language of the adjective) *X* 2(position of the adjective) *X* 2(language of the host sentence) repeated-measures anal-

ysis of variance. For this analysis, the position of the adjective was classified into two categories: correctly versus incorrectly positioned. This categorization was based on whether the position of the adjective was correct or incorrect according to the rule of the language of the adjective. In other words, Spanish adjectives that were in postnoun position and English adjectives that were in prenoun position were categorized as correctly positioned adjectives.

All three sentence characteristics affected the adults' acceptability judgments. Sentences containing correctly positioned adjectives were accepted at a higher rate (75%) than those containing incorrectly positioned adjectives (33%), $F(1, 14) = 117.64$, $p < .001$. There was a language of the adjective $\times$ position of the adjective interaction, $F(1, 14) = 9.79$, $p < .01$. The difference in acceptance rate between sentences containing correctly positioned adjectives and those containing incorrectly positioned adjectives was larger when the adjective was English (88% vs. 25%) than when it was Spanish (63% vs. 40%). However, sentences containing correctly positioned adjectives were significantly more likely to be accepted than sentences containing incorrectly positioned adjectives for Spanish as well as English adjectives, $t(14) = 2.63$, $p < .05$; $t(14) = 9.06$, $p < .001$. Finally, there was a language of the sentence $\times$ position $\times$ language of the adjective interaction, $F(1, 14) = 5.53$, $p < .05$. Two 2(position $\times$ 2(language of the sentence) analyses of variance indicated that, while the language of the sentence did not significantly affect the subjects' discrimination between the two positions for Spanish adjectives, $F(1, 14) = .09$, the effect of the adjectival position for English adjectives was greater in English sentences than it was in Spanish sentences, $F(1, 14) = 7.99$, $p < .01$.

An analysis of the corrections that the adults made to regular mixed noun phrase sentences that were judged unacceptable also suggests that grammaticality judgments were primarily based on the position of the adjective. Four types of corrections were coded: (1) elimination of code switching, resulting in a one-language sentence, (2) changing the word(s) that were code-switched such that the code switching within the subjectival noun phrase was eliminated, (3) reversing the order of the adjective and noun in the code-switched noun phrase, (4) other types of changes. Since the "other" category accounted for less than 10% of the changes made, it was excluded from further analyses. Analyses were performed using both arcsin transformed scores and nontransformed scores. Since the results were the same, only the results for the nontransformed scores will be reported here. A 2(language of the adjective) $\times$ 2(position of the adjective) $\times$ 3(type of change) repeated-measures anal-

ysis of variance showed there was a main effect for type of change, $F(2, 28) = 8.54, p < .01$. As shown on Table II, reversals were the most common type of correction made for all types of unacceptable sentences. There was also a position of the adjective × type of change interaction, $F(2, 28) = 6.92, p < .01$. As would be expected, post hoc comparisons indicated that corrected sentences were more likely to contain reversals of noun and adjective when the adjective was incorrectly positioned than when it was correctly positioned (see Table II). The position of the adjective did not affect the other types of changes made.

Exceptional Mixed Noun Phrase Sentences

For the analysis of exceptional mixed noun phrase sentences, pre-noun position was categorized as correctly positioned for both Spanish and English adjectives. Similiar to the pattern found with regular mixed noun phrase sentences, sentences containing correctly positioned adjectives were more likely to be accepted than those with incorrectly positioned adjectives, $F(1, 14) = 115.93, p < .001$. In addition, there was a greater discrimination between sentences with correctly positioned adjectives and those with incorrectly positioned adjectives when the sentence contained an English adjective (93% vs. 20%) than when it contained a

Table II. Proportion of Three Types of Corrections Made to Regular and Exceptional Mixed Noun Phrase Sentences by Mexican-American Adults[a]

	Type of change		
Sentence construction	Reversal	Nonsubjectival code switching	No code switching
Regular noun phrase			
Correctly positioned adjective	36	20	3
Incorrectly positioned adjective	58	14	8
Exceptional noun phrase			
Correctly positioned adjective	8	5	13
Incorrectly positioned adjective	68	13	4

[a]When a subject found all examples of a certain type of sentence acceptable, the proportion of all types of changes was zero. Therefore, the sum of the proportions of the four types of changes averaged across subjects does not equal 100%.

Spanish adjective (92% vs. 37%), $F(1, 14) = 7.56$, $p < .05$. Planned comparisons showed that the effect of the position of the adjective was significant for sentences with either Spanish adjectives, $t(14) = 7.43$, $p < .001$, or English adjectives, $t(14) = 11.82$, $p < .001$.

The way the subjects corrected unacceptable exceptional mixed noun phrase sentences also indicated that the position of the adjective was the crucial variable in these sentences. A $2 \times 2 \times 3$ analysis of variance revealed a significant main effect for type of change, $F(2, 28) = 8.60$, $p < .01$, and a type of change $\times$ position interaction, $F(2, 28) = 22.60$, $p < .001$. Reversals were significantly more frequent for sentences containing an incorrectly positioned adjective than for those with correctly positioned adjectives (see Table II). Unlike regular noun phrase sentences, reversals were the most common type of change made for sentences containing incorrectly positioned adjectives but not for sentences containing correctly positioned adjectives (see Table II).

Mixed Verb Phrase Sentences

The 2(language of the auxiliary) $\times$ 2(language of the host sentence) analysis of variance conducted for the Mexican-American adults' acceptance rate of mixed verb phrases revealed an interaction effect for the two variables, $F(1, 14) = 11.67$, $p < .01$. There was a higher acceptance rate for sentences in which the code-switched word was a verb (as in 3b and 3d on Table I) than sentences in which the code-switched word was a form of the auxiliary *to have* or *haber* (as in 3a and 3c).

Mixed Verb Sentences

A 2(type of inflection) $\times$ 2(language of inflection) $\times$ 2(language of the host sentence) analysis of variance of the acceptance rate of sentences containing mixed verbs revealed a significant main effect for language of the host sentence, $F(1, 14) = 4.83$, $p < .05$, a type of inflection $\times$ language of the inflection interaction, $F(1, 14) = 6.09$, $p < .05$, and a type of inflection $\times$ language of the inflection $\times$ language of the sentence, $F(1, 14) = 6.09$, $p < .05$. Insertion of a Spanish progressive in an English sentence and an English past tense in an English sentence were more acceptable than the other types of sentences. It should be noted that there were only two examples of each type of sentence, and therefore this three-way interaction may be due to the acceptability of a particular mixed sentence rather than a type of sentence.

The changes that the adults made to these sentences clearly indicated

that they based their judgments on the presence of the mixed verbs. The most common type of change made to these sentences was to change just the verb "to be" in one language. This type of change accounted for 84% of the changes made to these sentences.

Effect of Conflicting Rules

The effect of a conflict of the grammatical rules in Spanish and English on the acceptability of a code-switched sentence was determined by comparing the acceptance rate of regular mixed noun phrase sentences, exceptional mixed noun phrase sentences, and mixed verb phrase sentences. If conflicting rules decrease the acceptability of code switching, then one would expect regular mixed noun phrase sentences to have a lower rate of acceptance than either exceptional mixed noun phrase sentences or mixed verb phrase sentences. Only a subset of the sentences ($N = 24$) were included in this analysis. First, only the judgments of the regular and exceptional mixed noun phrase sentences that contained correctly-positioned adjectives were included in order to determine the effect of a conflict of rules independent of the effect of the specific adjective position rule. Second, the analysis was conducted only on sentences where the code-switched word was in the same language as the host language because the exceptional mixed noun phrase sentences included only Spanish adjectives in Spanish sentences and English adjectives in English sentences. Specifically, the analysis was performed on all exceptional mixed noun phrase sentences, the subset of regular mixed noun phrases that contained Spanish adjectives in Spanish sentences and English adjectives in English sentences, and the subset of mixed verb phrase sentences that contained Spanish auxiliaries in Spanish sentences and English auxiliaries in English sentences. The 2(language of the auxiliary on adjective) $\times$ 3(type of sentence construction) analysis of variance revealed a significant effect for sentence construction, $F(2, 28) = 7.83$, $p < .01$, and a significant language of the code-switched word $\times$ sentence construction interaction, $F(2, 28) = 4.96$, $p < .01$. Regular mixed noun phrase sentences containing Spanish adjectives ($M = 70\%$) were accepted at a lower rate than the other sentences (M range = 90%-97%).

Effect of Word Boundaries

The hypothesis that code switching is not permissible within word boundaries was tested by comparing the acceptance rate of mixed verb sentences with that of mixed verb phrase sentences. The one-way analysis

of variance revealed a significant effect for sentence construction, $F(1, 14) = 39.32$, $p < .001$. In support of the hypothesis, Mexican-American adults found mixed verb phrase sentences highly acceptable ($M = 81\%$) and mixed verb sentences highly unacceptable ($M = 29\%$).

Effect of Code Switching-Experience

Next, the effect of code-switching experience on the grammatical judgments made for these constructions was analyzed by comparing the judgments made by the non-Mexican-American adults with those made by the Mexican-American adults.

For the regular mixed noun phrase sentences, only one sentence characteristic showed a significant effect for code-switching experience. As is evident in Table III, the discrimination between sentences containing correctly positioned adjectives and those containing incorrectly positioned adjectives was greater for Mexican-Americans than for non-Mexican-Americans, $F(1, 28) = 9.19$, $p < .01$. Although the difference was less, the non-Mexican-Americans still accepted significantly more sentences with correctly positioned adjectives than with incorrectly positioned adjectives, $t(14) = 3.24$, $p < .01$. In addition, the types of changes made to the regular mixed noun phrase sentences that were judged unacceptable did not differ significantly for the two types of adults.

Code-switching experience did not affect the acceptance rate or the changes made to exceptional mixed noun phrase sentences.

The acceptance rate of mixed verb phrase sentences by non-Mexican-Americans was significantly lower ($M = 49\%$) than the rate by the Mexican-American adults ($M = 81\%$), $F(1, 28) = 8.18$, $p < .01$. However, the pattern of acceptance judgments was not affected by code-switching experience: Sentences containing a code-switched verb were more acceptable than those with a code-switched auxiliary for both types of adults.

Table III. The Effect of the Position for Regular Mixed Noun Phrase Sentences (% accepted)

	Mexican-American				Non-Mexican-American adults
Position	2nd-3rd grade	4th-5th grade	6th-7th grade	Adults	
Correct	79	90	80	75	68
Incorrect	57	63	46	33	48

The comparison of the judgments by the two types of adult bilinguals for mixed verb sentences revealed four interactions: a type of adult × language of the sentence, $F(1, 28) = 6.47, p < .05$; a type of adult × type of inflection, $F(1, 28) = 6.24, p < .05$; a type of adult × language of inflection, $F(1, 28) = 5.04, p < .05$, and a type of adult × type of inflection × language of the inflection, $F(1, 28) = 12.06, p < .01$. Post hoc comparisons revealed that non-Mexican-Americans rejected all types of mixed verb sentences at a higher rate than Mexican-Americans except for sentences containing the English progressive inflection. Although there was a difference in the effect of these sentence characteristics on acceptance rate, the type of changes made to mixed verb sentences was similar for the two groups of adults. As with the Mexican-American adults, the most common type of change made to these sentences by the non-Mexican-Americans was to change only the verb so it was all in one language ($M = 74\%$).

Analyses comparing the acceptance rate of the different constructions that tested for the effect of conflict and code switching within boundaries indicated that code-switching experience did not significantly effect the pattern of judgments made. Like the Mexican-American adults, non-Mexican-Americans found regular mixed noun phrase sentences containing Spanish adjectives ($M = 67\%$) less acceptable than other types of mixed noun phrase sentences (M range = 73%-82%). They also found mixed verb phrase sentences more acceptable ($M = 49\%$) than mixed verb sentences ($M = 13\%$).

Developmental Changes

Developmental changes in the rules for code switching were analyzed by comparing the judgments made by the four age groups of Mexican-Americans.

Age had a significant main effect on the acceptability judgments made for regular mixed noun phrase sentences, $F(3, 56) = 3.97, p < .05$. The second- and third-graders ($M = 68\%$), and fourth- and fifth-graders ($M = 77\%$) accepted more sentences overall than did the sixth- and seventh-graders ($M = 63\%$) or the adults ($M = 54\%$). There was also a significant age × position interaction, $F(3, 56) = 3.02, p < .05$. Duncan's post hoc comparisons indicated that the second- and third-graders and the fourth- and fifth-graders accepted sentences containing incorrectly positioned adjectives significantly more often than did the Mexican-American adults (see Table III). However, sentences that contained correctly positioned adjectives were accepted significantly more

often than sentences that contained incorrectly positioned adjectives by all age groups, $t(14) = 4.53, p < .001$; $t(14) = 4.68, p < .001$; $t(14) = 6.85, p < .001$, respectively. In addition, there were no significant differences in the types of changes the different-aged Mexican-Americans made to these sentences.

The analyses of the judgments made for the exceptional mixed noun phrase sentences showed there was a significant age × language of the adjective interaction, $F(3, 56) = 4.63, p < .01$, a significant age × position of the adjective interaction, $F(3, 56) = 3.16, p < .05$, and a significant age × position of the adjective × language of the adjective interaction, $F(3, 56) = 4.76, p < .01$. A series of 2 × 2 analyses of variance for each age group showed a significant position effect for all ages but a significant position × language of the adjective effect for only the three oldest age groups. As can be seen on Table IV, while the three older age groups rejected incorrectly positioned adjectives at a higher rate when the adjective was English than when it was Spanish, the youngest age group rejected Spanish and English incorrectly positioned adjectives at an equal rate. Duncan's post hoc comparisions indicated that the second- and third-graders rejected sentences containing incorrectly positioned English adjectives at a significantly lower rate than did the sixth- and seventh-graders or adults. Fourth- and fifth-graders rejected sentences containing incorrectly positioned Spanish adjectives at a significantly lower rate than did the adults. There was no age effect on the type of changes made to these sentences.

For the mixed verb phrase sentences, there was a significant age × language of the auxiliary × language of the host sentence interaction, $F(3, 56) = 3.64, p < .05$. Two × two analyses of variance conducted

Table IV. Effect of the Position and Language of the Adjective on Acceptance Rate for Exceptional Mixed Noun Phrase Sentences by Mexican-Americans (% accepted)

Language and position of the adjective	Grade			
	2nd-3rd	4th-5th	6th-7th	Adults
English				
Correct	90	97	95	93
Incorrect	48	30	22	20
Spanish				
Correct	85	97	95	92
Incorrect	52	73	57	37

for each age group revealed a language of the auxiliary × language of the host sentence interaction for the sixth- and seventh-graders and adults but not for the second- and third-graders or the fourth- and fifth-graders. As is evident in Table V, the second- and third-graders and the fourth- and fifth-graders accepted more sentences containing a code-switched auxiliary than the adults did.

For sentences containing mixed verb sentences, there was a significant main effect for age, $F(3, 56) = 7.25$, $p < .001$. Post hoc comparisons indicated that second- and third-graders accepted these sentences ($M = 76\%$) at a significantly higher rate than did sixth- and seventh-graders ($M = 42\%$) or adults ($M = 24\%$). Fourth- and fifth-graders accepted these sentences at a higher rate ($M = 63\%$) than did the adults. Age did not interact with the effect of the three sentence characteristics on acceptability judgments. Although the acceptance rate of these sentences differed for the different-aged subjects, the changes made to sentences judged as unacceptable were very similar. Of the subjects who rejected at least one mixed verb sentence, changing just the verb into one language was the most common type of sentence correction made. This type of correction accounted for 84% of the changes made by the second- and third-graders, 91% of those made by the fourth- and fifth-graders, and 69% of those made by the sixth- and seventh-graders.

The comparison of the mixed noun phrase and verb phrase sentences that tested for the effect of conflict on acceptability judgments revealed no main effect or interaction effects of age on the pattern of acceptance of these sentence types.

In contrast, the test for the effect of code switching within a word showed a marked effect of age. There was a significant main effect for age, $F(3, 56) = 5.79$, $p < .01$, and an age × sentence construction interaction, $F(3, 36) = 5.12$, $p < .01$. Sixth- and seventh-graders and adults found sentences contained mixed verbs considerably less accept-

Table V. Acceptance Rate by Mexican-Americans of Mixed Verb Phrase Sentences Containing Code-Switched Auxiliaries and Code-Switched Verbs (% accepted)

Code-switched word	Grade			
	2nd-3rd	4th-5th	6th-7th	Adults
Verb	88	93	90	90
Auxiliary	87	87	77	65

able than those containing mixed verb phrases (83% vs. 42%, 78% vs. 24%, respectively). There was a much smaller difference in the rates of acceptance for these two types of code-switching constructions for the second- and third-graders (88% vs. 76%) and the fourth- and fifth-graders (90% vs. 63%).

Children's Metalinguistic Abilities

The above analysis revealed that there were significant age effects for all four constructions. A second analysis, correlating pretest performance with rates of acceptance, was performed to help determine if these age effects were due to differences in the subjects' rule systems or to differences in the subjects' ability to perform the metalinguistic judgments required of the task. Recall that to pass the pretest the children had to reach a criterion in one of the two languages. All children reached criterion for the English sentences but 26 did not for the Spanish sentences. Most of these children failed to reject sentences containing the incorrectly positioned Spanish adjective. This response pattern could be due either to a lack of an adjectival placement rule for Spanish or to problems with the task requirements. If the former hypothesis is true, one would expect the children's performance on the pretest Spanish sentences containing incorrectly positioned adjectives to be highly correlated with their performance on regular mixed noun phrase sentences containing an incorrectly positioned Spanish adjective but not necessarily with their performance on other sentences. On the other hand, if pretest performance is indicative of the children's ability to perform the task, one would expect pretest performance to correlate with the children's performance on all constructions. Correlational analyses were conducted for the 45 children. Performance on the pretest Spanish sentences containing an incorrectly positioned adjective correlated with performance on regular noun phrase sentences containing an incorrectly positioned Spanish adjective, $r = .31$, $p < .02$; exceptional mixed noun phrase sentences containing incorrectly positioned English adjectives, $r = .29$, $p < .03$; mixed verb phrase sentences with code-mixed auxiliaries, $r = .37$, $p < .01$; and mixed verb sentences, $r = .35$, $p < .01$. There were no significant correlations between pretest performance and performance on regular mixed noun phrase sentences containing correctly positioned English or Spanish adjectives or incorrectly positioned English adjectives; exceptional mixed noun phrase sentences containing correctly positioned Spanish adjectives, correctly positioned English adjectives, or incorrectly positioned Spanish adjectives; or mixed verb phrase sentences containing

code-mixed verbs. All the constructions that correlated with the pretest showed a significant age effect for acceptability judgments. Those that did not correlate did not show an age effect, with only one exception: Although younger children accepted all regular mixed noun phrase sentences containing incorrectly positioned adjectives more than older children, the acceptance rate of regular mixed noun phrase sentences containing incorrectly positioned English adjectives was only marginally correlated with pretest performance, $r = .19$, $p < .10$.

Language Dominance

Four analyses of variance, one for each sentence construction, were conducted to test for the effect of language dominance on acceptance rate of these constructions. The children were classified into three categories of language dominance on the basis of their score on the Oral Language Dominance Test. There were 26 English Dominant children (M age = 10 years 2 months), 9 Spanish Dominant children (M age = 11 years 8 months), and 10 Balanced Bilingual children (M age = 8 years 7 months). There were no main effects for language dominance, or interactions between language dominance and sentence characteristics for any of the four sentence constructions.

DISCUSSION

Analyses of the judgments by the Mexican-American adults showed that several variables affected the acceptability of each construction. For both regular and exceptional mixed noun phrase sentences, sentences containing correctly positioned adjectives were more acceptable than those containing incorrectly positioned adjectives. Thus, the resolution of the conflict between the word order rules of English and Spanish was to follow the rule for the language of the adjective. Analyses of the corrections made to mixed noun phrase sentences also indicated that it was the position of the adjective and not code switching within a noun phrase that the subjects found unacceptable. The discrimination between the two positions of the adjective was stronger when the adjective was in English than when it was in Spanish. This may be due to interference from English. Several researchers (e.g., Sole, 1975) have noted that "regular" Spanish adjectives are sometimes placed, incorrectly, in the prenoun position, by Mexican-Americans when speaking Spanish. However, since the same pattern is found for exceptional mixed noun phrase sen-

tences, where the positioning for the English and Spanish adjectives is the same, this cannot be the sole explanation. The stronger position effect for English adjectives may also be due to the fact that there is one placement rule in English, while there are two conflicting Spanish placement rules.

For sentences containing mixed verb phrases, sentences with a code-switched verb were more acceptable than those with a code-switched auxiliary. For sentences containing mixed verbs, the use of a Spanish progressive in an English sentence and an English past tense in an English sentence was more acceptable than the other six types of sentences. The limited number of examples of the nine types of sentences makes it impossible to determine if this effect was due to the increased acceptability of these constructions or to the particular sentences used in the task.

The comparison of the judgments made for the constructions suggested that there is a rule against code switching within a word: Sentences with mixed verbs were much less acceptable than sentences with mixed verb phrases. The results did not indicate that there was a rule against switching within a construction where there is a rule conflict bewteen the two languages. Although regular mixed noun phrases containing correctly positioned Spanish adjectives were less acceptable than exceptional mixed noun phrase sentences with correctly positioned adjectives and verb phrase sentences, this was not the case for regular mixed noun phrase sentences containing correctly positioned English adjectives. As was just discussed, the lower acceptance rate of the Spanish adjective mixed noun phrase sentences is probably due more to the existence of two placement rules in Spanish and from interference from English than to the conflict between English and Spanish rules.

Although it is possible that the knowledge of bilinguals is based on the construction-specific rules just described, these rules could also be particular applications of the three interconstruction rules following:

1. It is unacceptable to switch within word boundaries.
2. The word order rules used when mixing a word from one language into a sentence of another is determined by the placement rule of the language of the mixed word for that word's form class. This rule is weaker when there is more than one word-order rule for that word class in the language of the mixed word.
3. It is more acceptable to code-switch a content word than a function word.

The effect of these rules on grammatical judgments is clearly variable, rather than categorical, in nature. In other words, the code-switching rules operate with different probabilities in different linguistic

environments rather than in an all-or-none manner (for a discussion of variable rules, see Brown, 1973; Cedegren & Sankoff, 1974; Labov, 1969).

How do speakers know these three rules? The evidence from the bilingual adults suggests that the grammatical rules governing code switching are not based on extensive exposure to code switching. Although the two groups of adults differed on the overall acceptability of certain constructions, the pattern of responding on the four constructions was similar for all adults. Thus, although code-switching experience affected the strength of a rule's effect on grammatical judgments, the same rules seemed to govern the judgments made by both types of adults. This suggests that the rules for code switching are primarily based on knowledge of the grammars of the two code-switched languages in combination with some general linguistic knowledge. By "general linguistic knowledge" we are referring to non-language-specific knowledge about languages that a speaker learns by learning any language—for example, knowing what a word is, or that endings to words can change the meaning of the word.

However, the developmental evidence indicates that the rules may be learned through exposure to code switching. The youngest two groups seemed to find all the code-mixed sentences acceptable except for sentences that violated the word-order rules. The difference between the younger children and the adults was especially striking for the mixed verb sentences. There are three explanations for this age effect. First, it could be that extensive exposure to code switching may be needed to learn rules 2 and 3. Evidence from the bilingual adults indicates that exposure to code switching does not always seem necessary: the rule against switching within a word was even stronger for the adult non-Mexican-Americans than for the adult Mexican-Americans. However, Mexican-American children may need the exposure because they have grown up in a linguistic environment containing many loan words that violate the word boundary rule. As when children learn the rules of Spanish or English, children growing up in a code-switching environment may formulate a more general rule than exists in the adults' language—namely, that it is acceptable to use inflections from one language on any word from the other language. Subsequently, the children would need to learn that these loan words are exceptions to the rule prohibiting such mixing.

Second, the developmental changes found in this study could be due to changes in the ability to make acceptability judgments rather than changes in the grammar of code switching. The fact that the children's

performance on the pretest correlated with those constructions that showed an age effect gives some support to this explanation. If this is the case, the results would suggest that children develop notions of acceptability about correct word order before they develop such notions about the use of morphemes. Research that has compared the developmental changes in judgments of deviant word-order sentences with changes in judgments made to sentences containing missing morphemes has not found differences between the two types of metalinguistic knowledge (Saywitz & Wilkinson, 1982). However, the sentences used in the research by Saywitz and Wilkinson were both semantically and syntactically anomalous. Perhaps it is only when acceptability is based on purely structural deviance, such as in the present study, does knowledge about morphemic rules lag behind knowledge of word-order rules.

Finally, the developmental changes in code-switching knowledge could reflect a change in general linguistic intuition. The prohibition against code switching within a word must be based on a feeling that a word, unlike a sentence or a clause, is an indivisible entity that cannot be subdivided into its component parts (i.e., root and inflection). It seems logical that this notion is not acquired until after the child develops a good understanding of what words, sentences, and clauses are. This may not be acquired until fairly late in development, since the ability to segment an utterance into its component words does not seem to get perfected until the child is 7 or 8 years old (Saywitz & Wilkinson, 1982). Further research is needed to determine which of these three explanations is correct.

REFERENCES

Aguirre, A. (1980). Toward an index of acceptability for code alternation: An experimental analysis. *Aztlan, 11*, 297–322.

Bentahila, A., & Davies, E. (1983). The syntax of Arabic-French code-switching. *Lingua, 59*, 301–330.

Brown, R. (1973). *A first language: The early stages*. Cambridge: Harvard University Press.

Cedegren, H., & Sankoff, D. (1974). Variable rules: Performance as a statistical reflection of competence. *Language, 50*, 333–355.

Genishi, C. (1981). Code-switching in Chicano six-year-olds. In R. Duran (Ed.), *Latino language and communicative behavior*, Norwood, New Jersey: Ablex.

Gingras, R. (1974). Problems in the description of Spanish-English intrasentential code-switching. In G. Bills (Ed.), *Southwest areal linguistics*. San Diego: Institute for Cultural Pluralism.

Gumperz, J. (1977). The sociolinguistic significance of conversational code-switching. *RELC Journal, 8*, 1–34.

Huerta, A. (1977). The acquisition of bilingualism: A code-switching approach. *Sociolinguistic Working Paper 39*. Austin, Texas: Southwest Educational Development Laboratory.

Labov, W. (1969). Contraction, deletion, and inherent variability of the English copula. *Language, 45*, 715–762.

Lipski, J. (1978). Code-switching and the problem of bilingual competence. In M. Paradis (Ed.), *Aspects of bilingualism*. Columbia, South Carolina: Hornbeam Press.

McClure, E. (1977). Aspects of code-switching in the discourse of bilingual Mexican-American children. In M. Saville-Troike (Ed.), *Georgetown University Round Table on Languages and Linguistics*. Washington, D.C.: Georgetown University Press.

McClure, E., & McClure, M. (1975). Code-switching among Mexican-American children. In H. Sharifi (Ed.), *From Meaning to sound*. Lincoln: University of Nebraska.

Pfaff, C. (1979). Constraints on language mixing: Intrasentential code-switching and borrowing in Spanish-English. *Language, 55*, 291–318.

Poplack, S. (1980). Sometimes I'll start a sentence in Spanish y termino en Espanol: Toward a typology of code-switching. *Linguistics, 18*, 581–618.

Saywitz, K., & Wilkinson, L. C. (1982). Age-related differences in metalinguistic awareness. In S. Kuczaj (Ed.), *Language development* (Vol. 2). Hillsdale, New Jersey: Erlbaum.

Sole, Y. (1975). Sociolinguistic perspectives on Texas Spanish and the teaching of the standard language. In G. Harvey & M. Heiser (Eds.), *Southwest languages and linguistics in educational perspective*, San Diego: Institute for Cultural Pluralism.

Timm, L. (1975). Spanish-English code-switching: El porque y How-not-to. *Romance Philology, 28*, 473–482.

Wentz, J. (1977). *Some considerations in the development of a syntactic description of code-switching*. Unpublished doctoral dissertation, University of Illinois.

Wentz, J., & McClure, E. (1976). Aspects of the syntax of the code-switched discourse of bilingual children. In F. J. Ingemann (Ed.), *1975 Mid-America Linguistics Conference papers*. Lawrence, Kansas: University of Kansas.