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On the emergence of bilingual code-switching competence*

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Code-switching among proficient adult bilinguals has been extensively studied, and it is by now universally concluded that intra-sentential code alternations are rule-governed and systematic, displaying dependency relations that reflect the operation of underlying syntactic principles. The central, guiding question to be addressed herein is whether and, if so, how second language learners acquire the knowledge that defines structural coherence and allows them to render well-formedness judgments for code-switched forms. This exploration takes on particular significance given that learners receive no evidence which could guide them in rendering such judgments, and therefore results consistent with those observed among competent bilinguals could be imputed to unconscious, abstract linguistic knowledge. The investigation thus proves doubly fruitful, in the discovery of developmental patterns and in the evaluation of linguistic-theoretical methodologies and constructs.

Few characteristics of bilingual speech have inspired as much scholarly research as code-switching, the alternating use of two or more linguistic codes in a single conversational event. Of particular concern for the present discussion is intra-sentential code-switching, which demonstrates grammatical regularities. Introducing code-switching data into the discussion of Universal Grammar, as advanced in the generativist framework, Belazi, Rubin and Toribio (1994) argue that the coherence and co-occurrence restrictions attested in Spanish–English code-switching may be captured by reference to the Functional Head Constraint, proffered as a general principle of human language. This constraint, grounded in the system of categories of Chomsky (1986) and the relations proposed in Abney (1987), dictates that the abstract semantic and syntactic features of a functional head must match the corresponding features of its complement; the Functional Head Constraint merely extends the scope of f-selection to include language indexing. Accordingly, a functional head and its complement must be drawn from the same sub-class of items in the lexicon, precluding switching between functional elements (e.g., MOD/AUX, NEG, and COMP) and their f-selected complements.

Such well-formedness judgments about the utterances that result from intra-sentential code alternations are proffered by proficient bilinguals, who possess advanced competence in the two component language systems. However, little is known of the development of the syntactic knowledge that is manifested in these judgments. At the same time, results revealed by research in infant and later childhood bilingualism suggest that a child's increased competence in the component languages correlates with increased sensitivity to adult-like code-switching norms. Such findings have been interpreted by researchers such as Meisel (1994) as indicating that syntactic constraints on code-switching can only operate once the child has acquired adequate knowledge of the functional categories that define structural coherence. The present study seeks to ascertain whether similar evidence can be uncovered in the linguistic development of second language learners. To that end, the work evaluates the extent to which adult learners of diverse levels of bilingual competence obey the Functional Head Constraint in their code-switching judgments. It should be clear that inherent

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in the endeavor is a recasting of the traditional question of whether or not adult learners have access to such universal principles, and the type of data and argumentation that bear on this research question.

The assessment of the operation of the Functional Head Constraint among learners is accomplished through the administration of tasks designed to access linguistic competence – a grammatical acceptability questionnaire and an introspective linguistic survey – to three participant groups: Advanced, Intermediate, Beginner. The findings reveal an increased sensitivity to this syntactic-theoretical constraint with increased second language competence: the Advanced participants' code-switching judgments are in consort with the constraint, and the Beginner and Intermediate participants demonstrate the emergence of the application of the universal principle. These findings are amenable to an interpretation on which universal principles are internalized and available, and the differential judgments across bilinguals of diverse competences are ascribed to the differences in the feature specifications of the lexical categories and functional projections that are held to motivate linguistic derivations and constrain linguistic well-formedness (cf., Chomsky's, 1993, 1995, Minimalist Program). The study thus makes a contribution to syntactic theory, advancing it with data from code-switching, and additionally reflects and informs a current topic in linguistic theorizing, namely, accessing and characterizing adult second language learners' developing linguistic competence.

The presentation is organized as follows. As a convenient point of departure, I begin with an overview of the language contact phenomenon of interest, presenting the early surface ordering constraints of Poplack (1980) and several generative treatments that have sought to account for the attested syntactic patterns within the framework of the Government–Binding version of the Principles and Parameters model (Chomsky, 1981, 1986), among them, Woolford (1983) and DiSciullo, Muysken, and Singh (1986). The Functional Head Constraint of Belazi et al. (1994) will be adopted, as it captures the data illustrative of Spanish-English code-switching competence in a fashion that is consistent with more general considerations of theoretical syntax. The subsequent section addresses counterexamples to the constraint, as set forth by Mahootian and Santorini (1996), MacSwan (1997), and Nishimura (1997), and in so doing, makes more explicit the rationale and the methodology for the present investigation. The criticisms leveled against the Functional Head Constraint will be evaluated, especially in view of the methodological, empirical, and linguistic-theoretical obstacles that must be surmounted in code-switching research. The constraint is reaffirmed, and experimental and empirical data are presented in corroborating its validity in characterizing code-switching competence among proficient bilinguals (cf., e.g., Bhatia and Ritchie 1996; Sunderman, 1996, 1998; Toribio, 2000b). The Functional Head Constraint is then further argued to be sound and defensible, given the state of linguistic theory, e.g., the proposals set forth in Grimshaw (1991), Chomsky (1993, 1995), Rubin (1996), and Roeper (1999), and psycholinguistic inquiry, e.g., the proposals of Green (1986), Levelt (1989), De Bot (1992), and Poulisse (1999).

I then turn to examine the issue of the grammatical competence that is required for successful code-switching, reviewing several studies of adult and child bilingual populations which reveal that increased competence in the component languages is a prerequisite for rule-governed code-switching (cf., e.g., Poplack, 1980; McClure, 1981; Rakowsky, 1989; Toribio, Roebuck, Lantolf, and Perrone, 1993; Meisel, 1994; Bhatia and Ritchie, 1996; Toribio and Rubin, 1996a). The discussion foregrounds the presentation of the study that is the kernel of this work. As elaborated, the study aims to ascertain whether and, if so, how the sensitivity to the Functional Head Constraint emerges in incipient adult bilingualism; included are the guiding hypothesis, description of participants, tasks, and procedures, and the results of the experimentation. The pursuant section presents an analysis and synthesis of the findings of the study, which indicate a developmental cline in learners' ability to make reliable acceptability judgments on code-switched forms. Finally, I rehearse the implications of the findings of the study for current trends in second language acquisition research, in particular, the views of Dekydtspotter, Sprouse and Anderson (1997) and the model of second language learning set forth in Herschensohn (2000), and conclude the work with observations on the relevance of bilingual data to syntactic theorizing more generally.

Spanish–English code-switching as rule-governed bilingual behavior

Code-switching refers to the ability on the part of bilinguals to alternate between their linguistic codes in the same conversational event.[1] Contrary to common assumptions, code-switching is most frequent among proficient bilinguals, and may indeed

[1] As noted in Gumperz and Toribio (1999), the term "code-switching" was first employed to refer to the coexistence of more than one structural system in the speech of one individual by Jakobson, Fant and Halle (1952), who use "code" in the abstract information theoretical sense. In later writings, "code" has come to be synonymous with "language" or "speech variety".

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be the norm in many bilingual communities.[2] The study of code-switching has, to date, been focused largely on the societal and social factors that enter into its characterization, e.g., the amount and frequency of linguistic contact, the differential patterns of language usage, and the individual and community attitudes towards the language varieties at issue. Without question, a complete understanding of code-switching cannot be achieved without the benefit of complementary ethnographic and socio-psychological study, unfortunately extending beyond the scope of this work. Parallel to these studies, however less numerous, are research endeavors grounded in syntax, where scholars have examined the grammatical properties of code-switching; it is this arena wherein the present work seeks to make its primary contribution. Thus, the investigation departs from the premise that the study of code-switching cannot proceed uninformed by a properly structural analysis. In this, we are in agreement with Muysken (1995, 178), who affirms that "to understand which cases are of the same type, and which are different, to see which patterns are exceptional or marked and which are not, to be able to do quantitative research, for all this we need to know what the structural features of the patterns are".

With respect to its form, code-switching in intra-turn utterances may be inter-sentential or intra-sentential, as exemplified in the Spanish–English sentences in (1a) and (1b), respectively. (Note that, for ease of exposition, the forms from Spanish are rendered in italics in the sample sentences throughout this work.)

(1) a. *Llegamos a los Estados Unidos en los 60s*. New York was our home.
"We arrived in the United States in the 60s. New York was our home."
b. Code-switching among bilinguals *ha sido la fuente de numerosas investigaciones*.
"Code-switching among bilinguals has been the source of numerous studies."

Intra-sentential code-switching is to be distinguished from related contact phenomena, such as insertional code-switching (oftentimes termed "borrowing") and tag-switching (cf., Romaine, 1995, for insightful discussion). Insertional switching, shown in (2), represents the introduction of individual lexical items into a recipient language; the loan words may be partially or wholly assimilated into the host language with respect to phonological and morphological form. Tag-switches, illustrated in (3), serve a pragmatic role, functioning as sentence fillers or revealing a speaker's attitude towards the content of an utterance (e.g., expressing doubt, conviction, inquiry, confirmation); tags may be phrases, clauses, or particles, and typically occur at phrase or clause boundaries.

(2) a. *El estudiante leyó el libro en el* reference room.
"The student read the book in the reference room."
b. I met up with my *compadres* at the *fiesta*.
"I met up with my buddies at the party."
(3) a. It is raining a lot these days, *verdad*?
"It is raining a lot these days, isn't it?"
b. So, *deberías llevarte el paraguas*.
"So, you should take the umbrella."

In general, lexical insertions and tags are interjected from one language into a sentence that is otherwise entirely in another language. As expected, these linguistic phenomena are routinely evidenced among both monolingual and bilingual members of a speech community (cf., Gumperz, 1971, 1976). In contrast, intra-sentential code-switching is limited to speakers with a high degree of bilingual competence. Still, as remarked by Poplack (1980:615) it is "precisely those switch types [that occur within a single sentence] which have traditionally been considered most deviant by investigators and educators".

To be sure, the status of intra-sentential code-switching had been much in dispute. Some linguists viewed it as indicative of imperfect language acquisition, extreme cross-linguistic interference, or just poor socio-linguistic manners.[3] Labov (1971) is frequently cited as referring to code-switching as the "irregular mixture" of two linguistic systems, and numerous others have despaired of finding any constraints on what Lance (1975) called a "willy-nilly" combination. However, subsequent studies have revealed that code-switching is rule-governed and systematic (cf., Gingràs, 1974; Gumperz and Hernández-Chávez, 1975; Timm, 1975; Aguirre, 1977; Gumperz, 1976; Pfaff, 1979; Reyes, 1976, 1978), demonstrating grammatical regularities that reflect the operation of underlying syntactic restrictions (cf., Poplack, 1980, 1981; McClure, 1981; Zentella, 1981; Lipski, 1985).[4] That is, bilinguals may be shown to exhibit a shared knowledge of what constitutes appropriate code-switching. For example, Spanish–English bilingual speakers will agree that the sen-

[2] The reader is referred to Gumperz and Toribio (1999) for a brief description of code-switching, to Bhatia and Ritchie (1996) for a state-of-the-art view of relevant research on the formal syntactic aspects of code-switching, and to the edited anthologies of Jacobson (1990), Milroy and Muysken (1995), and Auer (1998) for in-depth cross-disciplinary studies.

[3] Consult Toribio (2000d, 2001) for relevant discussion on the purported correlation of code-switching and native language attrition.

[4] The studies listed reference only representative research specific to Spanish–English code-switching.

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tences in (4) represent possible code-switches, whereas those in (5) do not, although they may be unable to articulate exactly what accounts for this differential judgment.[5]

(4) a. *Toda mi familia* speaks English well.
"All of my family speaks English well."
b. And almost all of them *hablan español también*.
"And almost all of them speak Spanish too."

(5) a. *Five of my cousins have *completado estudios universitarios*.
"Five of my cousins have completed university studies."
b. **Y de éstos, dos han* completed degrees while working full-time.
"And of these, two have completed degrees while working full-time."

Moreover, speakers render acceptability judgments in the absence of overt instruction – bilinguals are not taught how to code-switch; and yet, just as monolingual native speakers of Spanish and English have an intuitive sense of linguistic well-formedness in their language, Spanish–English bilinguals are able to rely on unconscious principles in distinguishing between permissible and unacceptable code-switches. In generative research on monolingual codes, this linguistic awareness is assumed to constitute part of a speaker's genetic endowment, appropriately termed Universal Grammar. As set forth in Chomsky (1981) and elsewhere, Universal Grammar is a set of abstract and general principles assumed to be adequate for characterizing core grammars of all natural languages. The question arises as to whether the syntactic coherence and co-occurrence restrictions that are attested in bilingual code-switching should be characterized by reference to this same innate system. In approaching this issue, the ensuing discussion explores the grammatical patterns that underlie Spanish–English code-switching, with the goal of delimiting those syntactic constraints most relevant for its characterization and explicating these within current models of linguistic competence.

Surface constraints

Significant advances have been made in our understanding of the grammatical constraints that restrict the form that code-switching takes. In early analyses of code-switching, the notion of grammatical equivalence has played an important role. Such a formalization of the patterns observed in Spanish–English code-switching was proposed by Poplack (1980):

(6) a. Equivalence Constraint (Poplack, 1980)
Code-switches will tend to occur at points in discourse where the juxtaposition of L1 and L2 elements does not violate a syntactic rule of either language, i.e., at points around which the surface structures of the two languages map on to each other.
b. Free Morpheme Constraint (Poplack, 1980)
A switch may occur at any point of the discourse at which it is possible to make a surface constituent cut and still retain a free morpheme.

One of the leading assumptions in Poplack's effort is that equivalence between the grammars of two languages promotes bilingual code-switching.[6] Thus, for example, switching should occur more readily in typologically related languages, such as Spanish and English, than in other language pairs. Poplack observes that code-switching between Spanish and English occurs at various boundaries, facilitated by the surface uniformity of the languages.[7] But where the surface structures differ, as with the placement of clitic pronouns (the Spanish object pronoun is preposed to the verb, whereas in English it is postposed), code-switching is precluded, as in (7). And even where the surface structures coincide, the Free Morpheme Constraint accounts for the non-occurrence of word-internal switching, as observed in the forms in (8).

(7) *I saw *lo*./**Yo vi* him.
"I saw him/*(Yo) lo vi*."

(8) **Yo estoy* eat-*iendo*.
"I am eating/*(Yo) estoy comiendo*."

However, the Equivalence Constraint and the Free Morpheme Constraint face significant challenges on cross-linguistic grounds: code-switching is known to occur between languages that lack the surface congruence called for by the proposed constraint, as between such language pairings as Arabic–French (Belazi, 1991), Japanese–English (Naito, 1993), Swedish–Iranian (Naseh, 2000), etc. In addition, as noted in Belazi et al. (1994), these conditions are insufficiently restrictive even when they are operating in conjunction, thereby allowing a grammar to overgenerate. In the case of Spanish–English alternations, switching should be possible at numerous sites, including the clause juncture in (9), since the word orders of Spanish and English are equivalent in these constructions; but, in fact, such code-switching is

[5] The judgments are consonant with proposals put forth by numerous researchers, such as those previously enumerated: the juncture between subject and predicate is a common switch boundary in bilingual speech, whereas that between auxiliary and main verb is not.

[6] Consult Sankoff and Poplack (1980) for an alternative reformulation of Poplack's constraints.

[7] Lipski (1978) and Pfaff (1979) likewise conclude that surface structures common to both languages are favored sites for switching.

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infelicitous. (Note that the Free Morpheme Constraint likewise fails to explain why switching is impossible between the complementizer, a free morpheme, and its complement, the subordinated clause.)

(9) a. *The doctor warned the patient that *el fumar hace daño*.
b. **El médico le avisó al paciente que* to smoke is hazardous.
"The doctor warned the patient that to smoke is hazardous."

The Equivalence Constraint fails not only on empirical grounds, but on theoretical grounds as well (Belazi et al., 1994). This constraint is formulated in terms of linear order and adjacency, expanding the set of grammatically significant categorical generalizations. Moreover, as a condition on the interaction of two grammars, it is a "third grammar", unique to code-switching. Such extra-grammatical, code-switching-specific notions diminish the strength of the theory of grammar that includes them. It would be preferable for code-switching to be restated in syntactic-theoretical terms by independently motivated universal principles of grammar. In the past decade, interesting observations and analyses have been attempted in this area of research.

Generative-syntactic constraints

As expressed by Bhatia and Ritchie (1996, 645), the challenge in research on code-switching "is not whether or not it is subject to grammatical constraints but how best to capture these constraints and how to make deeper claims about human language in general and bilinguals' mixing competence and their language acquisition in particular". Accordingly, recent years have witnessed considerable attention devoted to exploring code-switching in the context of Chomsky's Principles and Parameters theory. These investigations have sought an explanatory adequacy that was lacking in earlier, more descriptive formulations, by exploiting universal principles and relations which are hypothesized to characterize monolingual competence. This line of inquiry into language contact was initiated by Woolford, who contends that the examination of data from bilingual code-switching "promises to provide a fertile new source of evidence bearing on a wide range of questions in current grammatical theory" (1983, 520).

According to Woolford's (1983) generative model for code-switching, the component grammars of the bilingual remain separate, just as they do in monolingual speech, but when the speaker generates a code-switched utterance, each grammar contributes part of the sentence. Thus, as shown in (10), the lexicons of the two grammars maintain their autonomy, precluding word-internal switching; and as illustrated in (11), both lexicons have access to terminal nodes in syntactic constructions that are common to both Spanish and English. In contrast, whenever a phrase structure rule unique to one language is used to expand a node, the terminal positions must be filled from the lexicon of that language, predicting the ill-formedness of examples such as those in (12), where the phrase structures of Spanish and English differ.[8]

(10) a. *I am read*iendo*. / **(Yo) estoy ley*ing.
"I am reading."
b. I put the forks *en las mesas*.
"I put the forks on the tables."
(McClure, 1977, cited in Woolford, 1983)

(11) a. *Todos los mexicanos* were riled up.
"All of Mexicans were riled up."
(Pfaff, 1979, cited in Woolford, 1983)
b. *El hombre* who saw the accident *es cubano*.
"The man who saw the accident is Cuban."
(Gingràs, 1974, cited in Woolford, 1983)

(12) a. **El* man *viejo está enojado./ *El hombre* old *está enojado*.
"The old man is upset."
(Gingràs, 1974, cited in Woolford, 1983)
b. **Yo lo* bought. / **Yo* it *compré*.
"I bought it." (Quintero, cited in Woolford, 1983)

Finally, Woolford observes that while the grammars of Spanish and English share the phrase structure rule for expanding the sentence, the question-formation data in (13) are ill formed. On Woolford's view, such data may be accounted for by appeal to differences between Spanish and English with respect to inversion in matrix contexts: English requires subject–auxiliary inversion, where Spanish allows main verb inversion. However, when neither language requires inversion, as with subject extraction, code-switching between the wh-phrase and the remainder of the sentence is permitted, as in (14).

(13) a. *How *lo hizo*?
"How did s/he do it?"
(Peñalosa, 1980, cited in Woolford, 1983)
b. *When *vino*?
"When did s/he come?"
(Peñalosa, 1980, cited in Woolford, 1983)
c. *Why *lloras*?
"Why are you crying?" (Woolford, 1983)
d. *Cómo *did he do it*?
"How did he do it?" (Woolford, 1983)

(14) Which of these men *es tu padre*?
"Which of these men is your father?" (Woolford, 1983)

While Woolford's model goes a long way towards accounting for code-switching patterns, a closer

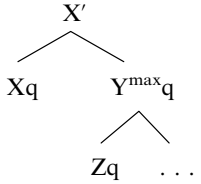
[8] Woolford's model represents an early generative reformulation of the constraints previously proposed by Poplack (1980).

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examination reveals that it is insufficiently restrictive. For example, as noted in (9) above, switching is disallowed between the complementizer and its clausal complement, although the grammars of Spanish and English share the same phrase structure rules in the switched components. And Woolford's proposal is in other respects too restrictive, as matrix non-subject wh-extraction is in fact allowed, on the condition that the switched segments are of sufficient length (cf., Lipski, 1985; Toribio, 2000c).[9] Still, these counterexamples notwithstanding, we recognize the import of Woolford's contribution in introducing code-switching data into linguistic theorizing.[10]

Further advancing this generative model of bilingual code alternations, DiSciullo et al. (1986) propose that code-switching is restricted by the Government Constraint, drawing on this X-bar-theoretical hierarchical relation in disallowing code-switching between particular elements in bilingual speech:

(15) Government Constraint (DiSciullo et al., 1986)
  a. If Lq carrier has index q, then $Y^{max}q$.
  b. In a maximal projection Y^{max}, the Lq carrier is the lexical element which asymmetrically c-commands the other lexical elements or terminal phrase nodes dominated by Y^{max}.
  c.



[9] Thus, while the data in (13) are ruled out for prosodic reasons, the corresponding data in (i)–(iii) below are acceptable. A grammatical analysis should take account of the acceptability of the data in (i)–(iii), rather than rule out that in (13) (cf., Toribio, 2000c).

(i) ¿*Con cuánta frecuencia* does the bell chime?/ How often *suena la campana*?
(ii) ¿*A qué hora* did the mayor arrive? / At what time *llegó el alcalde*?
(iii) ¿*Con qué motivo* did he pose that question?/ With what aim *hizo esa pregunta?*

[10] In subsequent work Woolford (1984), further pursues this aim, characterizing the constraints on long-distance subject extractions by reference to the proper government condition on the application of wh-movement in Spanish and English (cf., Chomsky, 1981; Torrego, 1984). Motivated by similar interests, D'Introno (1996) also suggests that the patterns of grammaticality in wh-extraction in Spanish–English code-switching may be accounted for by appeal to the Empty Category Principle (Chomsky, 1981). In particular, D'Introno proposes that a wh-trace and its governor must bear the same language index, i.e., they must be drawn from the same lexicon. As will become evident, D'Introno's account is identical to the Government Constraint proposed in DiSciullo et al. (1986), which disallows code-switching between elements that stand in a government relation.

On this structural account, elements that stand in a government relation (the governor and governee) must share the same language index, i.e., the government relation entails language co-indexation. For example, the constraint predicts that verbs and their complements will be in the same language; likewise, nouns and subordinate relative clauses will share the same language index. However, this prediction is contrary to what is in evidence in Spanish–English code-switching, where such boundaries serve as common switch points, as attested previously and in the ensuing examples.

(16) a. The sleepy travelers boarded *el vuelo de las 5:00*.
"The sleepy travelers boarded the 5 o'clock flight."
  b. *Los niños pidieron* pillows and blankets.
"The children requested pillows and blankets."
  c. The wayward animal was captured and placed *en el zoológico nacional*.
"The wayward animal was captured and placed in the national zoo."
  d. *Nuestro decano se presentó* for the position of Chancellor.
"Our dean came forward for the position of Chancellor."
  e. The visitor said *que en su país no se pagan impuestos*.
"The visitor said that in his/her country they don't pay taxes."
  f. *Los maestros concluyeron* that their pupil suffered from anxiety.
"The teachers concluded that their pupil suffered from anxiety."

Thus, while DiSciullo et al. may be correct in proposing that code-switching is constrained by general principles of syntactic coherence that hold true of all natural languages, the formulation of this configurational constraint in terms of government is incorrect, as it proves overly restrictive, ruling out permissible switches.

Continuing in this generativist vein in their investigation of code-switching, Belazi et al., (1994) propose the Functional Head Constraint, a feature-matching principle of Universal Grammar:

(17) Functional Head Constraint (Belazi et al., 1994)
The language feature of the complement f-selected by a functional head, like all other relevant features, must match the corresponding feature of that functional head.

In positing this well-formedness condition, Belazi et al. appeal to the well-established distinction between functional categories, such as COMP and AUX, and lexical categories, such as VERB and NOUN (Chomsky, 1986). In particular, these authors invoke the special relation thought to exist between a functional head and its complement, one

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to which Abney (1987) refers as "f-selection" in constraining code-switching. According to Belazi et al., the Functional Head Constraint is a specific application of the general process of feature checking that holds between a functional head and its complement: a functional head requires that the language feature of its complement match its own language feature. (The challenge to the linguistic-theoretical status of the "language feature" invoked by the constraint cannot be understated and I return to the matter presently.)

The operation of the Functional Head Constraint is evident in the patterns of language alternation in Spanish–English code-switched speech, as reported in the research literature (cf., e.g., Gingràs, 1974; Timm, 1975; Gumperz, 1976; Wentz and McClure, 1976; Aguirre 1977; Jacobson, 1977; Lipski, 1978, 1985; Pfaff 1979). As exemplified in (18)–(20), code-switching is disallowed between the functional heads that articulate INFL (e.g., MOD/AUX, NEG) and their complements. And, as shown in (21)–(23), a similar relation holds between the functional head COMP and its IP complement, between the functional head QUANT/NUM and its NP complement, and between a coordinating conjunction and its XP complement.

(18) a. *The president will *dirigirse al público*.
"The president will address the public."
b. **El candidato puede* prepare his remarks during the flight.
"The candidate can prepare his remarks during the flight."

(19) a. *The young man was *encarcelado por sus delitos*.
b. **El joven fue* jailed for his crimes.
"The young man was jailed for his crimes."

(20) a. *Two colleagues did not *entregar trabajos para el congreso*.
b. *Dos colegas no *submitted trabajos para el congreso*.
"Two colleagues did not submit works for the conference."

(21) a. *The professor said that *nosotros somos buenos alumnos*.
b. **La profesora dijo que* we are good students.
"The professor said that we are good students."

(22) a. *The seventeen *niños del valle faltaron a la escuela*.
b. **Los diecisiete* children from the valley were absent from school.
"The seventeen children from the valley were absent from school."

(23) a. *The director spoke and *pidió que ayudáramos con los preparativos*.
b. **La directora habló y* asked that we help with the preparations.
"The director spoke and asked that asked that we help with the preparations."

It should not go unremarked that omitted from consideration here are switches between DET and its NP complement, an exclusion that is well motivated. As nouns are the most frequently borrowed category of words, it proves difficult to determine whether a cross-linguistic pairing of determiner and noun is representative of insertional or alternational code-switching. For instance, MacSwan (1997, 172 fn 64) suggests that "English determiners may often precede Spanish nouns: The *borracho* who came to dinner yesterday *se tomó toda la tequila* ('The drunk who came to dinner yesterday drank all the tequila')." However, in the context of his example, *borracho* is a single noun insertion, which is more appropriately interpreted as a borrowed item (cf., Wentz and McClure 1976, and Zentella, 1981, 1997, who likewise suggest that such alternations are ungrammatical as code-switches).

While switching between a functional element and its complement is correctly predicted to be ill formed by the Functional Head Constraint, switching between a lexical head and its complement is correctly predicted to be permissible: the data in (16) illustrated code-switching between the lexical head VERB and its complements, and (24)–(26) demonstrate code-switching between PREP, NOUN, and ADJ and their complements.[11]

(24) a. underneath *la cuna del niño*
"underneath the baby's crib"
b. *justo durante* my summer vacation
"precisely during my summer vacation"

(25) a. a new publisher *para el libro*
"a new publisher for the book"
b. *un nuevo título* for the manuscript
"a new title for the manuscript"

(26) a. very proud *de sus éxitos*
"very proud of his/her successes"
b. *agotada* from long hours of work
"exhausted from long hours of work"

The Functional Head Constraint additionally predicts the well-formedness of switching between a subject, which occupies the Specifier position of INFL, and its sister I′, which may host the verb in INFL. In addition to the code-switched subjects already noted, the data in (27) exemplify switching of subjects in predicate adjective and predicate nominal constructions.

(27) a. That part of Central Texas *es muy calurosa y húmeda*.
"That part of Central Texas is very hot and humid."

[11] It merits pointing out that the systematic production of switching between prepositions and their complements confronts Joshi's (1985) "Constraint on Closed Items" with a formidable challenge.

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b. *Nuestro maestro de química* is also a pharmacist.
"Our chemistry teacher is also a pharmacist."

Lastly, the Functional Head Constraint rightly allows for adjunct modifiers to phrases and clauses to be switched: (28) presents switching of restrictive relative clauses, (29) demonstrates switching of adverbial clauses, and (30) illustrates switching of a dislocated (base-generated topic) phrase.

(28) a. the Mexican fairy tale *que me contó mi padre*
"the Mexican fairy tale that my father told me"
b. *el cuento de hadas mexicano* that my father told me
"the Mexican fairy tale that my father told me"

(29) a. When the student arrived, *el maestro lo esperaba*.
"When the student arrived, the teacher was waiting for him."
b. *Tomemos un paseo* after dinner.
"Let's take a walk after dinner."

(30) a. That cousin of mine, *a veces lo veo en la República Dominicana*.
"That cousin of mine, sometimes I see him in the Dominican Republic."
b. *Las remolachas*, I don't like them at all.
"Beets, I don't like them at all."

As observed, the distinction between functional and lexical categories that is central to linguistic theorizing is also central to code-switching. The reformalization of Abney's notion of f-selection as the Functional Head Constraint not only succeeds in capturing the patterns of grammaticality in code-switched utterances, but does so in a fashion that is consistent with more general considerations of theoretical syntax and with the view of code-switching espoused here: language alternation in bilingual speech is constrained by the same principles that are operative in monolingual speech. I thus take for granted that the Functional Head Constraint has been laid out correctly in the generativist framework current to its elaboration, as evidenced by the fact that this universal principle, of a quite abstract sort, accounts for a broad range of code-switching data reported here and elsewhere in the literature. There are, nonetheless, counterclaims from other researchers, some working in cognate theories, others in versions of the Principles and Parameters theory, that should be addressed.

Reaffirming the validity of the Functional Head Constraint

As elaborated by Belazi et al., the Functional Head Constraint is held to underlie linguistic competence; it is a universal principle that is operative in monolingual and bilingual modes alike, though it finds additional, more visible evidence in code-switching. However, recent works by Mahootian and Santorini (1996), MacSwan (1997), and Nishimura (1997) have called into question the efficacy of the constraint. In their investigations of code-switching, these authors present apparent counterexamples which they construe as refuting the validity of the Functional Head Constraint. While such examples should not be hastily discounted, especially in the examination of the complex bilingual behavior that is code-switching, this same complex nature dictates that special attention should be devoted to defining and delimiting the scope of syntactic-theoretical investigations into this linguistic phenomenon. Specifically, the means by which code-switching is studied, the selection of items for analysis, and the framework in which the relevant data are interpreted take on particular relevance. The ensuing discussion addresses some of the methodological, empirical, and linguistic-theoretical problems that plague these recent research proposals, and in so doing, moves towards defining the goals of the present work.

Methodological considerations

Works addressing the grammar of code-switching in bilingual speech have made use of a wide variety of methodologies, chief among these, interviews and naturalistic recordings. Unfortunately, these approaches may be of limited value in the study of linguistic competence, as they yield data that reflect the speakers' competence only indirectly, at best. Interviews and self-reports about bilingual speech are unreliable. Bilinguals often find it difficult to remember which language was used in any particular speech exchange (cf., Gumperz, 1982). Moreover, the problem of self-reporting is exacerbated in situations of social stigma (cf., Gumperz, 1971, among numerous others), as a speaker may refrain from switching when being observed or recorded, owing to subjective factors such as the appropriateness of code-switching to the interview situation and the low esteem in which the practice is held (cf., Zentella, 1997; Toribio, 2000a). Recordings of naturalistic utterances are met with a more acute criticism: the linguistic performance of a speaker, in the form of natural data, may not be indicative of that speaker's underlying linguistic knowledge. Indeed, studies of code-switching performance in diverse bilingual communities have revealed significant variability and yielded counterexamples to many of the constraints posited (cf., e.g., Poplack, 1980, 1981). Of course, this is to be expected, since there are likewise no constraints on monolingual performance (cf., Poplack, 1983). I thus maintain with Jacobson (1977, 229), that since "utterances containing elements from two languages follow specific patterns of co-occur-

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rence and display the same rule-governed behavior that we normally associate with unilingual code", the distinction between competence and performance is applicable to the study of code-switching. But, given performance data alone, a researcher might erroneously conclude that there are no exceptionless constraints on the form that Spanish–English language alternation takes (cf., Toribio, 2000b).

The problem adduced here is endemic to almost all of the code-switching research reported to date. Especially noteworthy in this respect is the work of Mahootian and Santorini (1996), who admit only recordings of spontaneous speech on the grounds that linguistic theory must account for natural occurrences of the data for which it has been constructed.[12] This focus on natural code-switching data is incompatible with syntactic-theoretical modes of inquiry, since the absence of violations of deep principles in spontaneous utterances cannot be unequivocally credited to a constraint that exists on the speaker's grammar.[13] In assessing a speaker's competence, syntactic studies generally test his/her ability to judge a given sentence as a grammatical or ungrammatical string of the language; the assumption is that the correct response indicates that the speaker has applied the principle that licenses the structure of the intended form. Unfortunately, studies along these lines have been relatively uncommon in code-switching research; this in spite of the fact that the early studies of the 1970s (cf., e.g., Gingràs, 1974; Gumperz and Hernández-Chávez, 1975; Timm, 1975; Aguirre, 1977; Jacobson, 1977; Lipski, 1978) already indicated that there is a linguistic competence of code-switching.[14] As aptly recognized by McClure (1981, 72), "without native speakers' judgments about the grammaticality of an utterance, it is often difficult to determine whether the utterance clearly reflects the speaker's competence and so should be included in the corpus for which rules must account or whether it has been affected by performance factors, such as lapses of attention, and hence should be excluded from consideration". Thus, recordings of spontaneous speech must be complemented by elicitation of speakers' beliefs about ungrammatical sentences.

However, as remarked in Schütze (1996, xi), the problems of intuition "demand a careful examination of judgments, not as pure sources of data, but as instances of metalinguistic performance" (cf., Birdsong, 1989; Sorace, 1996). Therefore, while judgments may offer insight into competence, we must concede that they are themselves subject to performance variables, and findings based on judgment data are susceptible to the same confounding factors that beset those founded in production. Addressing code-switching data in particular, it can be readily observed that a speaker or researcher may accept or reject a code-switched sentence or response for non-linguistic reasons. We have already noted the problems inherent in soliciting norms of stigmatized behavior. And care must additionally be taken in interpreting code-switching judgments once obtained. In this light, we should reconsider MacSwan's suggestion that English determiners may precede Spanish nouns in code-switching, as in "the *demonio*" (contrary to the claims of Zentella, 1981, that the same language is normally maintained across such pairings). His assessment is founded on the informally elicited judgments of two bilinguals who report that a short pause before the code-switch improves the ill-formed sentence considerably (1997, 247). Clearly, this fact bears directly on the issue at hand – it may represent the speaker's attempt to comply with the injunction against switching at this site.[15] Owing to mitigating factors such as those outlined here, these previous contradictory accounts must be acknowledged, but interpreted with caution: syntactic theorization must rely on and reflect data that are indicative of syntactic competence.

Empirical considerations

Again, it is lamentable that much of our knowledge of code-switching is gleaned from observations or recordings of natural speech. In such cases, the researcher is faced with the task of determining whether the data collected are representative of the linguistic phenomenon under investigation. I have already cautioned that not all instances of language alternation can be considered code-switching. Still, many researchers use the same labels to refer to different phenomena, failing to determine whether the data in fact constitute code-switching or, rather, represent some other manifestation of language contact. By way of illustration, consider the examples

[12] The conclusions of Mahootian and Santorini are based largely on data presented in Mahootian's (1993) dissertation, which itself is based on five hours of recordings of natural data from diverse populations.

[13] A similar fate befalls the analyses of Halmari (1997) and Nishimura (1997).

[14] Aguirre (1977) represents an early endeavor to employ grammaticality judgments as a research tool in determining which code-alternation sequences are acceptable or unacceptable to bilingual speakers.

[15] Judgments similarly solicited from these two informants lead MacSwan to dismiss items such as those in (9, 21) which reference the ill-formedness of switching between a complementizer and its complement as "erroneous data" and conclude that "there is no ban on switches at this juncture" (1997, 241), contrary to the claims of Gumperz (1976), among others.

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in (31), which Mahootian and Santorini (1996, 476) present in refuting the Functional Head Constraint. Even a cursory review of these examples reveals that they warrant scrutiny. Specifically, as advocated by Muysken (1995), we must determine the extent to which such data can be interpreted as alternational code-switching involving properties of both languages or as insertional language-mixing governed primarily by features of one dominant language.

(31) a. Anyway, I figured *ke* if I worked hard enough, I'd finish in the summer.
(English with Farsi complementizer *ke* "that")
b. Look, a Jew was: a doctor, a lawyer, *oder* a businessman.
(English with Yiddish conjunction *oder* "or")
c. Where are they, *los* language things?
(English with Spanish determiner *los* "the-masc.pl.")
d. Maen *through* taemam-e ina raeftaem.
"I've gone through all of this" (Farsi with English preposition)

Likewise, Nishimura (1997), offers the Japanese–English code-switching data in (32) as countering the Functional Head Constraint. In these examples, the Japanese modal *suru* takes an English verb as its complement, in apparent violation of the Functional Head Constraint.

(32) a. *Nihonjin-wa minna* watch-*sareta no*.
"The Japanese were all watched."
b. *Warini* last-*shiteru yo, nagaku*.
"(The job) is lasting relatively long, you know."
(Nishimura, 1997)

However, these data are indicative of a general process of word-formation: Japanese allows for the creation of complex verbs through the addition of the semantically neutral modal, a morphological possibility that facilitates insertion of English content words into the Japanese base language.[16] But insertional and alternational code-switching represent distinct manifestations of the language contact that may be evidenced in the speech of a Japanese–English bilingual individual or community (cf., Naito, 1993).

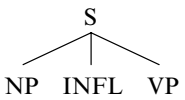
[16] More specifically, foreign verbs are borrowed into the deverbal noun category in Japanese, e.g. *taipu-suru* "to (do) typing". This process is observed also in Hindi–English bilingual forms such as *polish karo* "(do) polish(ing)" presented in Ritchie and Bhatia (1998), in Panjabi–English bilingual forms such as *guilt feel hona* "to feel guilty" presented in Romaine (1995), in Arabic–Persian bilingual forms such as *takzib kardan* "deny (do)" and Swedish–Persian forms such as *klara kardan* "manage (do)" presented in Naseh (2000), and in Spanish–English forms such as *hacer re-enlist* "(do) re-enlist" presented in Reyes (1978) and Pfaff (1979). In each case, the dummy verb *do* expresses the inflectional ending that is lacking from the borrowed verb form. Consult Muysken (1995) and Naseh (2000) for additional examples and discussion.

More generally, then, whenever the goal of an empirical study is to examine the compatibility between a linguistic construct and code-switching data, it must first be established that the data actually do reflect knowledge of the phenomena under analysis.

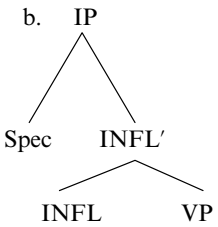
Syntactic-theoretical considerations

A more serious shortcoming in Nishimura's (1997) repudiation of the Functional Head Constraint is the syntactic-theoretical framework of analysis adopted. Her analysis is carried out within Chomsky's 1981 Government–Binding model. In this early version of phrase structure, the sentence is ternary branching: the head, INFL, is flanked by its sisters, the subject NP and VP, as in (33a).[17] In articulating the Functional Head Constraint, Belazi et al. assume the version of X-bar Theory proposed in Chomsky's later works (1986, 1991), in which all syntactic categories project phrases. In particular, inflection projects to IP and complementizers project to CP; in addition, two levels of phrase structure are projected: the phrasal level (XP) and the intermediate level (X'), with sub-categorized elements as sisters to X, and other modifiers as sisters to X′, as illustrated in (33b).

(33) a.



b.



Consonant with the Functional Head Constraint, code-switching is disallowed between a head X and its sister, when X f-selects its complement. Notably, the functional head does not bear the same dependency relation with its Specifier, and, accordingly, switching between these elements is predicted to be permitted. However, assuming the ternary branching structure of early phrase structure representations, i.e., (33a), Nishimura incorrectly argues that instances of switching between a subject NP and INFL serve to invalidate the Functional Head Constraint. Clearly, then, the theoretical framework chosen to evaluate a hypothesis will mediate subsequent inferences in significant ways.[18] While these

[17] A note of clarification is in order: the discussion in the text of Nishimura's manuscript proceeds within the early Government–Binding framework, referenced in her bibliography as Chomsky (1981); however, Nishimura incorrectly attributes this early version to Chomsky (1986).

[18] A related, though less egregious criticism of the Functional Head Constraint is leveled by MacSwan (1997). MacSwan

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and other challenges confronting researchers in code-switching should not be underestimated (cf., the urgings of Grosjean (1998) and the exhortations herein), the present work will undertake to redress at least some of the aforementioned methodological, empirical, and syntactic-theoretical shortcomings.

Corroborating evidence

Of course, establishing that existing criticisms against the Functional Head Constraint are not tenable does not prove that the constraint *does* apply beyond the data set on which it is based. In this regard, it merits noting that the Functional Head Constraint has been shown to account for code-switching between languages that are typologically dissimilar, e.g., Arabic–French code-switching (cf., Belazi et al., 1994), Japanese–English code-switching (cf., Naito, 1993), and Swedish–Iranian code-switching (cf., Naseh, 2000). Furthermore, the Functional Head Constraint has been studied with diverse elicitation techniques. For example, Sunderman (1996, 1998) administered an on-line processing task, via Rapid Serial Vision Presentation, to test the validity of the Functional Head Constraint in bilingual speech processing. The assumption underlying the experimentation was that processing times should be increased for syntactic strings that are in violation of the bilingual's competence. Testing this hypothesis, she measured six Spanish–English bilingual participants' reaction times in processing code-switched sentences that exhibit switching at the boundary between the functional element COMP and its IP complement versus those that exhibit switching at the boundary between the lexical element VERB and its CP complement. Though the differences in reactions were not significant (perhaps owing to the small number of subjects and tokens in the pilot), they are suggestive and invite further study: the average processing time for items that incorporated switching across COMP and IP was 741.86 ms., whereas the average processing time for items that incorporated switching across V and CP was 716.16 ms (cf., Sunderman and Toribio, 2000).

Also addressing the criticisms of the aforementioned researchers with additional methodologies, Toribio (2000b, 2000e) examined the language alternations sanctioned in Spanish–English bilinguals' reading, recounting, and writing of code-switched narratives. The findings converge in revealing participants' strong sensitivity to f-selection, as invoked by the Functional Head Constraint, across all three conditions. All of the bilingual participants demonstrated a distinct pattern of behavior in reading a text in which the same language was consistently maintained across a functional element and its complement, versus a text in which this relationship was frequently compromised by a language switch. These results are strengthened by participants' code-switched narrative productions.[19] As amply illustrated in the storytelling task, speakers failed to incorporate into their oral narratives code-switching that would result in a violation of the relation of f-selection.[20] Therefore, though not its primary aim, findings of Toribio (2000b, 2000e) can be interpreted as presenting forceful evidence of the extent to which the grammatical co-occurrence restrictions attested in Spanish–English code-switching adhere to the Functional Head Constraint.

The principles of syntactic coherence alluded to in Sunderman's on-line processing task and verified in Toribio's reading, recounting, and writing tasks evince bilinguals' awareness of dependency relations in intra-sentential code-switching. These principles of syntactic coherence can be stated in syntactic-

argues that current developments within linguistic theory – specifically, Chomsky's (1993, 1995) Minimalist research program – motivate a reanalysis of the constructs under investigation and that, consequently, Belazi et al.'s Functional Head Constraint has no relevance to the study of code-switching competence. Mahootian and Santorini too imply that the Functional Head Constraint is "contrary to Chomsky (1993)". However, it should be noted that the elaboration of Belazi et al.'s work pre-dates the advancement of the Minimalist Program. Moreover, a close examination of the constraint reveals that it is indeed in consort with Minimalist assumptions; we rehearse the argumentation in subsequent discussion and retake the matter in the concluding remarks.

[19] The oral narratives comprised a broad use of both languages, bringing into question the assumption that one language must be the base or matrix language in code-switched speech (cf., e.g., Myers-Scotton, 1993). A brief excerpt, drawn from Toribio (2000b), follows:

(i) Once upon a time, *en un lugar lejano*, there was a little girl *que se llamaba Caperucita Roja*. She liked walking through the forest, *escuchando los pajaritos*, *oliendo las flores*, *y apreciando la belleza natural*.
"Once upon a time, in a place far away, there was a little girl who was named Little Red Riding Hood. She liked walking through the forest, listening to birds, smelling the flowers, and appreciating the natural beauty."

[20] Thus, for example, there were attested no productions of switching between AUX and main verb; and in those few instances in which participants' productions led to utterances which would have violated the Functional Head Constraint, various types of disfluency, e.g., lengthy pauses and self-repairs, served to circumvent the potentially offending switch. (In the written texts, only single noun insertions presented apparent counterexamples, some of which could be more salient in one or the other language: e.g., *abuelita* ("grandma"), *hunter*, *wolf*.) In contrast, switching in those contexts predicted to be permissible – between lexical elements (e.g., NOUN, VERB, PREP) and their complements, between subject and predicate, between adjunct modifiers and phrases modified – was smooth in oral performance and commonplace in the written samples.

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theoretical terms by an independently motivated universal construct: the Functional Head Constraint. If the Functional Head Constraint were not operative, then participants' processing, judgments, and productions of intra-sentential code-switched forms should be random and unmotivated. Instead, these proficient bilinguals demonstrate knowledge of the linguistic principles that both license grammatical strings and disallow ungrammatical sequences for code-switching. These findings speak directly to criticisms concerning the empirical efficacy of the Functional Head Constraint. I now turn to demonstrate that the constraint is also justifiable given the current state of linguistic and psycholinguistic theory, devoting particular attention to the status of the language feature central to the Functional Head Constraint.

The Functional Head Constraint, linguistic theory, and psycholinguistic models

As conceived in Belazi et al. (1994), lexical and functional elements are associated with a particular language, and the Functional Head Constraint extends the scope f-selection to include language indexing. However, in syntactic theorizing, a particular language is assumed to be derivative in nature, a taxonomic artifact. As such, "Spanish" and "English" are merely labels for a set of linguistic expressions or formal objects that satisfy interface conditions, and, therefore, reference to a language feature in the Functional Head Constraint appears to stand in opposition to the research program adopted here, as MacSwan (1997) duly points out. In previous work, I have largely refrained from expounding on this issue; I will attempt to clarify the matter here, drawing on the insights of researchers in syntax and psycholinguistics.

The underlying assumption in the Minimalist Program (Chomsky, 1993, 1995) is that Language, properly understood in its technical sense, has two components: a language-specific lexicon and an invariant computational system. Therefore, in this system, a speaker may be hypothesized to possess multiple I-languages, comprised of multiple sub-lexicons, each of which includes substantive categories over which functional structure is projected. Rubin (1996) submits that the syntactic relevance of such partitions in the mental lexicon is independently motivated in monolingual speech, offering as evidence the distinction between two sub-classes of verbs that take dative arguments and participate in distinct grammatical processes – the Germanic and Latinate classes. (As is well recognized, only the Germanic sub-class participates in the dative alternation: *give a book to Mary*/*give Mary a book* vs. *donate a book to the library*/**donate the library a book*.) Following Rubin, a distinct language value is associated with each sub-class. Such a view of lexical differentiation is also key to the work of Roeper (1999), who posits that adult monolinguals demonstrate "islands of bilingualism", as manifested in the deployment of syntactic operations that are commonly perceived as circumscribing distinct speech registers. One such example is the formal PP-internal preposing that produces forms such as *whereafter*. Roeper reasons that if a speaker's normal register does not permit preposing inside PPs, then such a form "constitutes, in miniature, a different grammar" (1999, 183).[21]

Of course, it should be uncontroversial that lexical entries may include information about the status of the lexical items, e.g., whether the word is of the same dialect as the speaker's other vocabulary, whether it is of a special register or style, etc., as determined by the norms of the speech community.[22] The proposals of Rubin and Roeper, like the Functional Head Constraint, simply serve to call attention to the encoding of properly grammatical features, as consistent with the Minimalist Program (Chomsky, 1995). Therefore, while I am in agreement with MacSwan that labelings such as "Latinate" and "Germanic" or "Spanish" and "English" are "sociopolitical distinctions" that are most meaningful in addressing questions of language use, it is undeniable that language systems may make reference to sub-classes of lexical items; in the case of the monolingual, these may be specified as Class 1 and Class 2 or as Dialect A and Dialect B, in the case of the bilingual as Lexicon_1 and Lexicon_2, or as $\text{Lexicon}_{\text{Spanish}}$ and $\text{Lexicon}_{\text{English}}$.[23]

In fact, language indexation processes are dominant in psycholinguistic models of bilingual production. For example, in the model proposed by Green

[21] On this view, what makes varieties of a language distinctive is the operation of grammatical rules that apparently belong to different grammars. For application of such a proposal to intralingual variation, consult the works of Henry (1995, 1997) and Wilson and Henry (1998) on variability in Belfast English.

[22] Code-switching in bilingual speech is frequently likened to style-shifting in monolingual speech. To cite Hymes (1967, 9):

> Given the universality of code repertoires and of code-switching, then it does not appear decisive that the code varieties be distinct languages (bilingualism par excellence). Relationships of social intimacy or of social distance may be signaled by switching between distinct languages (Spanish: Guarani in Paraguay), between varieties of a single language (Standard German:dialect), or between a pair of pronouns within a single variety (*tu:vous*).

[23] In this regard, we should note that language indexation is also fundamental in the grammatical models put forth in Sankoff and Poplack (1980), DiSciullo et al. (1986), and Muysken (1995), among others.

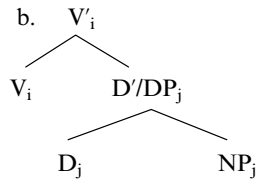
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(1986), words are tagged with a language label, by which they are activated or de-activated. This suggestion that words are identified by language tags underlies the work of Poulisse and Bongaerts (1994), who propose that language choice is specified in the preverbal message. In particular, they argue that because language is one of the features used in the selection process for code-switching, words must contain information that specifies the language to which they belong (cf., Poulisse, 1999). And even models such as that defended by De Bot (1992), in which the lexicon is language independent, also allow for words of one language to form a sub-set (Paradis, 1987), which can be separately activated in its entirety (cf., also De Bot and Schreuder, 1993).[24] These considerations allow for a reformulation of the Functional Head Constraint as making reference to the labeling of lexical sub-classes: a functional element and its complement will be activated from the same sub-class of lexical items.

This informal restatement may be further articulated in terms of abstract feature matching between functional structure and the lexical items that raise into them (cf., Rubin and Toribio, 1995, Toribio and Rubin, 1996b, MacSwan, 1997), and may alternatively be understood in view of Grimshaw's (1991) notion of extended projections – IP is an extended projection of VERB, DP is an extended projection of NOUN, etc. – as consistent with Minimalist assumptions. Taking the 'bottom-up' Minimalist perspective, a lexical category creates the 'language domain' for the projection.[25] For example, in (34) the computational system selects the three items in (a), each with a set of abstract features, to enter into the numeration. In structure-building, the NP, bearing language index <j>, merges with the determiner; the determiner must share the relevant phi-features (e.g., gender and number) and the language index <j> with the NP. Then V, bearing its own abstract features (e.g., Case) and language index <i>, selects and merges with the D′/DP theme, creating V′.[26]

(34) a. los (D)
libros (NP)
read (V)

b.



In current Minimalist-theoretical terms, then, the Functional Head Constraint may be understood as requiring that a functional head share the language index of the projection with which it merges. Still, irrespective of the specific analysis advocated for regulating intra-sentential code-switching, it should be clear that differences between languages reduce to lexical differences (cf., Borer, 1984; Chomsky, 1991, 1995), and thus the patterns attested in bilingual productions must derive from the interaction between the component lexicons (cf., Muysken, 1995; MacSwan, 1997). We return to this issue in the concluding discussion.

Code-switching and emergent bilingual competence

It merits re-emphasizing that the goal of the research presented in Belazi et al. (1994), like that underlying the present endeavor, is the exploration of the linguistic competence of the "perfect" code-switcher, in this case, a balanced adult bilingual.[27] But a bilingual may demonstrate disparate and variable levels of competence in the component languages, a concern as frequently acknowledged as overlooked in investigations on code-switching. The early work of Valdés (1976) suggested that patterns of code-switching are different for bilinguals of different levels of linguistic competence. This is corroborated by the ethno-

[24] It is clear that much insight into language processing is to be gained from further experimental investigation of code-switched speech production. One specific line of research that follows from the code-switching production findings reported in Toribio (2000b) and the bilingual production models referenced here relates to slips of the tongue (cf., Poulisse, 1999). The self-corrections demonstrated in the controlled code-switching reading task were not evidenced in the oral code-switching narrative productions (and the ill-formed combinations elicited in the reading task were not reproduced in the oral narrative condition).

[25] I am grateful to Jason Duncan for fruitful discussion on this proposal.

[26] In Toribio (2001), I develop this view in characterizing the differential patterns of grammaticality in code-switching in simple qualifying adjectival modification structures versus code-switching of adjectives in predicative function (cf., also Gumperz, 1976; Poplack, 1980; Sankoff and Poplack, 1980; Lipski, 1985; Zentella, 1997). Specifically, I argue that the former modifiers, as in (i), are of non-maximal (A′) status, and as such, fall within the "language domain" of the head noun; but, when such adjectival modifiers are used in predicative function or display internal structure, as with complementation and small clause predication, as in (ii)–(iv) they project maximal structures, which may bear their own language indices.

(i) **Los cansados* men took a recess. (The tired . . .)
(ii) *Los hombres estaban* visibly tired. (The men were . . .)
(iii) *Los hombres* tired from work left the plant early. (The men . . .)
(iv) *Considero a los hombres* very hard-working. (I consider the men . . .)

[27] While a truly balanced bilingual is an ideal, the term is employed to refer to a speaker who has native-like abilities in two languages. Thus, just as the linguistic patterns of a monolingual are measured against an idealized adult monolingual's native-speaker competence (Chomsky, 1965), so too are the linguistic patterns of the bilingual measured against an idealized adult bilingual's native-speaker competence.

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linguistic research of Zentella (1981, 1997) which attests that balanced adult bilinguals display behaviors in code-switching distinct from those of their more Spanish–dominant or English-dominant community peers. In other words, the degree of language proficiency that a speaker possesses in two languages correlates with the type of code-switching done.

In her research on bilinguals of diverse levels of competence, Poplack (1980) observes that those who reported to be dominant in one language tended to switch by means of tag-like constructions, sometimes to the exclusion of sentential or intra-sentential switches; in contrast, those who reported and demonstrated the greatest degree of bilingual ability favored intra-sentential switches, and favored tag-switching less. Research by Aguirre (1978, 1985) likewise confirms that more proficient bilinguals exhibit a greater sensitivity to grammatical constraints on code-switching than their non-fluent counterparts, as reflected in their judgments on code-switched forms of intra-sentential alternations. Referencing Ure (1972), and his own experimentation, Aguirre contends, "the fact that two grammars are involved means that this type of language patterning should be accessible only to fairly proficient bilingual speakers" (1985, 61–62). These notable findings indicate that the most proficient code-switchers are also the most proficient speakers of the contributing languages. In fact, Poplack (1980) asserts that code-switching patterns may be used to measure bilingual ability in that intra-sentential switches imply a greater degree of competence in the two grammars involved than do other manifestations of language contact.[28]

Moreover, similar patterns are attested in younger populations: words and constituents do not appear randomly in the mixed speech of bilingual children. McClure (1981) found that children who are not equally proficient in Spanish and English code-switch predominantly at the word level, usually choosing to switch nouns, while those children possessing equal proficiency in the two languages choose to code-switch at higher constituency boundaries within the sentence (cf., Zentella, 1981, 1997). McClure concludes that

> just as the monolingual improves his control over his verbal resources with age, so too does the bilingual. Further, just as there is a developmental pattern in the monolingual's syntactic control of his language, so too may such a pattern be found in the bilingual's control of the syntax of code-switching, which begins with the mixing of single items from one code into discourse in the other and culminates in the codechanging of even more complex constituents (1981, 92)

Code-switching in early childhood bilingualism

Studies of bilingual first language acquisition also support a direct correlation between degree of developmental proficiency in the two languages and the type of cross-linguistic interaction that is in evidence.[29] Meisel (1989, 1994), maintains that language "mixing", broadly defined as the indiscriminate combination of elements from each of the component languages, is most frequent during a very early phase of language acquisition, owing to limited competence, but as the child acquires greater competence in the two languages, the language contact attested (if any at all) increasingly takes the form of code-switching. In other words, rule-governed code-switching requires elaborate grammatical knowledge of two language systems, and as young children may lack such grammatical competence, their early language alternations cannot be classified as instances of code-switching (cf., Köppe and Meisel, 1995). Meisel and his colleagues base their conclusions on the language development of two French–German bilingual children who demonstrate a high mixing rate at the beginning of the study, which decreased quickly as they acquired greater functional structure. Especially noteworthy is the linguistic development of one child, Ivar, which consisted of two stages: the first stage did not appear to be syntactically constrained and showed high rates of mixing of function words, but in the second phase, there was a shift from mixing to code-switching, and by the age of 2;5 (years;months), adult-like norms on code-switching were rarely violated. These findings are interpreted as suggesting that the acquisition of functional categories plays a crucial role in the development of sensitivity to grammatical constraints on code-switching, such that before the development of the system of functional categories in the two languages, code-switching will not be guided by syntactic principles at all.

Rubin and Toribio (1996) further explore Meisel's contention that grammatical constraints on code-switching can only operate once the child has access to certain properties of grammars, most importantly

[28] Researchers such as Valdés (1981) and Lipski (1985) have observed that while competence in two languages is a necessary precondition, it is an insufficient prerequisite in determining successful code-switching performance: membership in a community in which code-switching is practiced may also be required. That is, code-switching practice requires social knowledge that is culturally specific and acquired through contextualized practice (cf., Toribio, 2000a).

[29] For a thorough-going treatment of bilingual first language acquisition, consult De Houwer (1995); and for a careful analysis and critique of earlier studies of language contact in developmental bilingualism, consult Babbe (1995).

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functional features, which crucially define coherence. Reviewing the relevant literature, the authors observe that bilingual children's early mixed language productions are not guided by the Functional Head Constraint. They note, however, that this early stage does indeed conform to a pattern specified by universal principles, i.e., the bilingual child does not demonstrate a "wild" grammar, but a transitional competence in which functional structure may be present but remain unspecified for functional features. Taking account of the patterns of language contact in bilingual development, Rubin and Toribio maintain that syntactic well-formedness in language alternations is respected once the child has acquired adequate knowledge of two grammatical systems, i.e., as soon as the feature specifications referenced by the Functional Head Constraint are in place (cf., Toribio and Brown, 1995). Thus, the Functional Head Constraint serves as the perfect complement to Meisel's and Köppe and Meisel's (1995) hypothesis concerning the appearance of functional categories; together these proposals capture the formal distinction between early language-mixing and code-switching.[30]

Code-switching among adult second language learners

The foregoing discussion leads us to hypothesize that, regardless of his or her age, the bilingual's language-mixing/code-switching ability serves as a measure of his or her syntactic competence in the component languages. In considering adult language learners, we predict that a similar correlation will obtain between speakers' level of second language proficiency and their sensitivity to the grammatical constraints governing code-switching. Unfortunately, while studies of code-switching in the bilingual elementary classroom are numerous, studies of code-switching in the adult second language classroom are far less common, since prescriptive norms are imposed. Code-switching is stigmatized in most learning contexts, and teachers and learners themselves generally relate it to a lack of language proficiency.[31] It is not surprising that code-switching, so perceived, is of little interest to second language research programs, which are concerned primarily with second language achievement. Nevertheless, a few second language researchers have undertaken productive, systematic investigations of learners' code-switching.

Rakowsky (1989) investigated the processing of intra-sentential code-switches by bilinguals and second language learners. She presented a sentence verification task to Spanish–English bilinguals and native English speakers who were learning Spanish as a second language. The test items included unilingual English sentences, unilingual Spanish sentences, sentences with a code-switch at phrasal boundaries, and sentences with a code-switch that did not correspond to a phrasal boundary. The bilingual subjects showed no significant difference in reaction times between code-switches at phrasal boundaries and unilingual sentences, but demonstrated significantly longer reaction times for sentences with code-switches that did not correspond to syntactic boundaries. The second language learners, like bilinguals, took no longer to process sentences with code-switched phrases than unilingual sentences. Unlike the bilinguals, however, second language learners did not show a delay in processing code-switches that did not correspond to phrasal boundaries, i.e., these sentences were not processed significantly slower than unilingual sentences or sentences with code-switched phrases. These findings are suggestive of translation and structural reinterpretation of code-switched sentences on the part of second language learners; the sentences are processed as consistent with structures and meanings of the dominant native language.

Similar results are documented in a pilot study carried out by Toribio et al. (1993). These authors designed and administered an elicited imitation task to determine whether syntactic constraints were operative in the code-switching productions of second language learners.[32] In this condition, partici-

[30] In accordance with Meisel's (1994) "grammatical deficiency" hypothesis, Rubin and Toribio (1996) perceive the forms of language contact in evidence in a bilingual child's linguistic development as conforming to a U-shaped pattern: high frequency of mixing due to limited competence early on, then diminished mixing with increased bilingual competence, and lastly, the emergence of adult-like code-switching.

[31] In fact, most teaching methodologies try to suppress this type of first language usage, because it is viewed as harmful to the acquisition process. In this context, code-switching is viewed not as a legitimate linguistic behavior, but as a failure on the part of the learner to even attempt a second language form.

[32] Elicited imitation has been used extensively in the first language acquisition research (cf., Frasier, Bellugi, and Brown, 1963), and more recently it has been used in the second language acquisition research, especially with bilingual children in which the technique was used as a measure of language proficiency. As described in Radloff (1991), such tasks measure a speaker's comprehension and control of syntax, as reflected in the chunking that is required. According to Hamayan, Markman, Pelletier and Tucker (1978, 331), "the validity of the technique rests on the assumption that a speaker, when presented with a sentence which exceeds the capacity of immediate memory, will pass it through an interim grammar before repeating it. If a specific syntactic feature is not part of an individual's grammar, that element will be distorted during production." To my knowledge, McClure (1981) was the first to employ a sentence-repetition task in investigating code-switching competence.

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pants listened to a fairy-tale in its entirety and then were presented with segments of the fairy-tale, which they were asked to repeat; the individual units contained grammatical code-switched forms, ungrammatical code-switched forms, and fully monolingual English and Spanish sentences. The preliminary results showed that the beginning second language students exhibited random processing errors, indicating that they had general difficulty with the task. The intermediate students imitated the well formed as well as the ill-formed code-switches with relative ease, indicating that, although more fluent than the beginners, they were not yet competent in both languages. Most significantly, the advanced group readily repeated the well-formed code-switched sentences, but had consistent difficulty with the ill-formed switches, demonstrating various types of disfluency (e.g., false starts, pauses, breakdowns, even laughter), and often altered the stimulus sentence to a well-formed code-switch. For example, when requested to repeat the ill-formed sentence in (35a), one advanced learner inserted a lengthy pause, indicated by # in (35b), as if to ensure that a switch was intended at that inopportune juncture, and another changed the ill-formed model to the well-formed sentence in (35c).

(35) a. Stimulus:
**El nuevo esposo le dijo que* the time had come for them to leave the palace.
"The new husband told her that the time had come for them to leave the palace."
b. Response:
El esposo le dijo que . . . # . . . the time had come to leave the palace.
"The new husband told her that it was time to leave the palace."
c. Response:
Su nuevo esposo told her that it was time to leave the palace.
"The new husband told her that it was time to leave the palace."

In reading these results, Toribio et al. conjecture that the beginning and intermediate second language learners accept and repeat the modeled code-switched strings, not because they are engaging in competent code-switching, but because they are inclined to interpret the Spanish segments of the sentences by way of their first language, English, and therefore, in their judgment, even the ill-formed switches do not constitute violations of principles of grammar – i.e., they do not show Universal Grammar effects distinct from those of the first language at this stage of development. These findings were replicated in a study carried out by Bhatia and Ritchie (1996, 1998) in which intermediate and advanced adult English-speaking learners of Hindi were asked to judge English–Hindi code-switched sentences that violated the dependency between various functional elements and their complements. In that study, the intermediate participants accepted ungrammatical code-switched sentences, demonstrating a propensity towards reinterpretation that was not evidenced among subjects with advanced bilingual competence, who offered responses that were consistent with the Functional Head Constraint. On the basis of these findings, Bhatia and Ritchie hypothesize that bilinguals follow specific stages in the process of acquiring the 'mixed' linguistic system: from one single native lexicon incorporating borrowings, to translation and reinterpretation across two lexicons, through the emergence of universal principles.

Referencing studies such as the aforementioned, Toribio and Rubin (1996a) offer a novel paradigm for research into the properly syntactic aspects of language contact and the nature and acquisition of multiple languages by children and adults. These authors argue that a lexicon structured in the fashion outlined in Chomsky (1993, 1995) provides a natural explanation for the behavior exhibited by child and adult learners. In particular, they suggest that language-mixing (Meisel's "fusion") in incipient bilingual acquisition may be attributed to deficiencies in the early lexicon. With respect to adult learners, the authors suggest that interference and transfer errors are due to differences between the first and second language in the abstract features of the lexical items that are held to constrain grammars. "In such a system, the task of a language learner is to assemble the appropriate set of features to form a unitary lexical item" (Toribio and Rubin, 1996a, 216). The obstacle facing a second language learner, they contend, is that many, if not most, of the features assigned to the majority of the lexical items of the first language will not be appropriate for the lexical items of the second language being acquired. It is this resetting that typifies inter- language grammars.

Yet, despite encouraging results, the limitations and imparities of previous studies (e.g., limitations in scope and imparities in methodologies and syntactic foundations, etc.) speak to the need for further investigation of the acquisition and development of the syntactic knowledge that allows bilinguals to render judgments distinguishing grammatical and unacceptable forms of intra-sentential code-switching. Such an investigation must be theoretically grounded and experimentally rigorous. To that end, the present study applies syntactic-theoretical models and methods to the analysis of code-switching in the context of second language learning.

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The present study: code-switching and second language acquisition

As established, native and more balanced Spanish–English bilingual speakers demonstrate knowledge of the abstract linguistic principles that both license grammatical strings and disallow ungrammatical ones for code-switching. At the same time, numerous and diverse studies indicate that a bilingual's increased competence in the component languages correlates with increased sensitivity to code-switching norms. Based on the conclusions of previous researchers that competent bilinguals render judgments on the grammatical status of code-switched sentences on the basis of linguistic intuitions, the present study seeks to ascertain whether similar evidence can be uncovered in the linguistic development of second language learners. This exploration takes on particular significance in the context of the second language classroom where learners receive no evidence, positive or negative, which could guide them in determining the appropriate code-switching patterns (the traditional "poverty of the stimulus" problem). Thus the discovery of co-occurrence restrictions in learners' judgments could be attributed to unconscious linguistic principles, i.e., to aspects of learners' emergent bilingual competence, specifically, those abstract features referenced in the Functional Head Constraint.

Hypothesis

The aim of the present study, then, is to determine whether the Functional Head Constraint is operative in second language acquisition, and what correlation obtains between the applicability of this constraint and a speaker's degree of bilingual competence. In accordance with this objective, we hypothesize that increased second language competence will correlate with increased success at rejecting ill-formed switches. This can be more formally stated as follows:

(36) As a speaker approximates competence in two languages, that speaker will exhibit a greater sensitivity to the principles of structural coherence that underlie intra-sentential code-switching, as expressed in the Functional Head Constraint.

Participants, tasks, and procedures

One hundred and four bilinguals participated in the study.[33] The participants were distributed over three levels of proficiency, as reflected by course placement and instructor observation – 44 Beginners: native English-speakers with one semester of university Spanish-language study and minimal previous high-school experience; 26 Intermediate learners: native English-speakers with three semesters of university Spanish-language study; and 34 Advanced speakers, with at least six semesters of university study.[34] Decisions concerning data collection and selection did not prove difficult, given the nature of the data that were the focus of interest. Practical considerations dictated that natural data would be generally unavailable since code-switching in learner interactions is tempered by negative assessments and normative pressures. But practicality aside, we have established that a learner's unconscious knowledge cannot be studied by reference to the linguistic performance of the speaker in the form of natural data (cf., Klein and Martohardjono, 1999). Moreover, as expressed at the outset, the present work proceeds from the perspective that research on code-switching should be motivated by theoretical principles and investigated with methodologies drawn from the sub-discipline of formal linguistics. As noted, linguistic studies routinely assess a speaker's competence through grammaticality judgments. And while grammaticality judgments are not a direct reflection of competence – competence is an abstraction – they do afford insights into competence, providing information about what are possible and impossible sentences in the speaker's grammar (cf., Chomsky, 1981). Thus, despite the controversial status of grammaticality judgments in testing target forms, an acceptability judgment questionnaire was designed and administered to the 104 participants.[35]

Unlike a traditional grammaticality judgment task, target sentences were presented in pairs, thereby drawing attention to the switch site, and participants were asked to render a judgment on acceptability, rather than on grammaticality. The questionnaire comprised 22 pairs of test sentences, incorporating

[33] I am grateful to Evan Palomeque, Tony Caraballo, Brian Imhoff, and Santiago Vaquera for granting me access to their classes. Some of the participants had had limited exposure to Spanish from a parent or other caretaker at a young age, but they were otherwise identified as English-dominant by the instructor.

[34] The 34 advanced participants were enrolled in a university-level Hispanic language and linguistics course. Although there were some differences in proficiency among the subjects, all were determined to be functionally bilingual.

[35] One reviewer questions the use of grammaticality judgments with speakers who may have had little or no experience with code-switching. In Toribio (2000a), I demonstrate that even those bilinguals who do not normally engage in code-switching are nevertheless able to make well-formedness judgments on code-switched language forms.

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switches from each language into the other; the paired sentences were identical, save for the juncture or direction of the code-switch. Participants were instructed to read each set of sentences carefully and indicate whether the (a) sentence was acceptable, whether the (b) sentence was acceptable, or whether neither sentence was acceptable (c); a sample test pairing appears in (37).

(37) Acceptability Judgment Questionnaire, sample item
  a. *Los estudiantes han elegido* a new representative.
  b. *Los estudiantes han* elected a new representative.
  √ (a) is acceptable _ (b) is acceptable _ (c) neither is acceptable

In this sample, (b) is predicted to be unacceptable by the Functional Head Constraint, as the switch occurs between the functional element MOD/AUX and its complement. Therefore, we expect that no participant will respond by indicating the acceptability of (b).[36] [37]

Of particular interest in corroborating the Functional Head Constraint is participants' acceptance/rejection of switching at the junctures of functional versus lexical categories and their complements. Accordingly, each pair of sentences included an item incorporating switching at the juncture of one of four functional categories (MOD/AUX, COMP, NEG, QUANT/NUM) or one of four lexical categories (PREP, NOUN, VERB, ADJ). In addition, there were several items that included switching at major category boundaries (e.g., between subject and predicate) and switching of various types of adjunct modifiers. The distribution of items appears here:

(38) a. four items that tested switching after the Modal/Auxiliary
  e.g., *Los estudiantes han* elected a new representative.
  "The students had elected a new representative."
  b. four items that tested switching after the Complementizer
  e.g., The clinic does not treat students that *no tienen seguro médico*.
  "The clinic does not treat students that don't have medical insurance."
  c. four items that tested switching after Negation
  e.g., *La biblioteca normalmente no* opens on Sunday mornings.
  "The library normally does not open on Sunday mornings."
  d. four items that tested switching after Quantifier/Number
  e.g., On this campus many *estudiantes andan en bicicleta*.
  "On this campus many students ride bicycles."
  e. three items that tested switching after the Preposition
  e.g., *Los estudiantes presentaron la obra delante de* receptive audiences.
  "The students presented the work in front of receptive audiences."
  f. one item that tested switching after the Noun (a nominalization)
  e.g., Parents' encouragement *de sus hijos es muy importante*.
  "Parents' encouragement of their children is very important."
  g. nine items that tested switching after the Verb
  e.g., The editor of the paper had written *un fuerte comentario*.
  "The editor of the paper had written a strong commentary."
  h. two items that tested switching after the Adjective[38]
  e.g., The student proud *de sus éxitos celebraba en San Antonio*.
  "The student proud of his accomplishments celebrated in San Antonio."
  i. two items that tested switching at the subject/predicate boundary
  e.g. The administrators *ignoraban los gritos de los manifestadores*.
  "The administrators ignored the cries of the strikers."
  j. nine items that tested switching of various types of modifiers
  e.g. At public institutions *pocos estudiantes se gradúan en cuatro años*.
  "At public institutions few students gradaute in four years."

[36] A (c) response is also consistent with the rejection of (b); however, the (c) response category was intended to allow for subjects to categorically reject code-switching for additional reasons, including extra-linguistic factors.

[37] It merits pointing out that although the sentences are paired, the task before the speaker is a judgment task, rather than a preference task. Thus, participants could find both sentences within the set acceptable. Consider in this respect the test pairing reproduced below.

(i) Acceptability Judgment Questionnaire, sample item
  a. The administrators ignored *los gritos de los manifestadores*.
  b. The administrators *ignoraban los gritos de los manifestadores*.
  √ (a) is acceptable √ (b) is acceptable _ (c) neither is acceptable

In this sample, both sentences should be deemed acceptable, as neither is in violation of the Functional Head Constraint: (a) represents switching at the verb/object boundary and (b) represents switching at the subject/predicate boundary. We predict, therefore, that respondents will indicate the acceptability of each, and that no respondent will reject code-switching in these contexts by marking (c).

[38] Two additional items tested switching of simple adnominal adjectives; these items served as counterparts to the complement-taking adjectives represented here. We return to the matter in the discussion of the findings.

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All totaled, 44 sentences were tested. The 22 pairs of sentences were randomized, and a practice item, incorporating a code-switch at the subject/predicate boundary (in both directions), was included to engage the participants in the task. The grammaticality judgment task was followed by an informal linguistic survey that consisted of a question posed to encourage participants to introspect on their judgments. The instructions read as follows:

(39) Now, review your responses on the acceptability questionnaire. Do you find that your responses are random? If not, what patterns emerge? What factors influenced your judgments? (*Please do not alter your initial responses as you review them.) [39]

Completion of the tasks required an average aggregate time of approximately 30 minutes.

Results and analysis

The first item on all of the questionnaires was the set of practice sentences that tested the acceptability of code-switching across the subject/predicate boundary. Participant responses for the practice item are shown in (40), with the number and percentage for each response indicating a preference for (a), for (b), or rejection of both (c).

(40) Practice item
1. (a) Several of my students *llegaron tarde a la conferencia del jueves*.
   (b) *Varios de mis estudiantes* arrived late for Thursday's lecture.
   Response n/% Advanced (34):
   (a) 34/100; (b) 33/97.05; (c) 0/0
   Intermediate (26):
   (a) 18/69.23; (b) 22/84.61; (c) 0/0
   Beginner (44):
   (a) 39/88.63; (b) 31/70.45; (c) 0/0

Though participants' responses on the set of practice items would not enter into our analysis, the responses are telling. The results demonstrate that speakers accepted switching across the subject/predicate boundary (in both directions), as predicted. Moreover, no participant found code-switching in both sentences unacceptable. In fact, an overview of items reveals a low incidence of response (c), except in pairings of items in which no well-formed alternatives were offered,[40] and in the context of adjectival modification, which we return to below. Yet, despite displaying no evidence of unfavorable dispositions towards code-switching in general, our respondents will be shown to demonstrate a shared level-specific sensitivity to code-switching at particular junctures.

Table 1. *Acceptance of switching between functional elements and their complements (%)*

	Advanced (n=34)	Intermediate (n=26)	Beginner (n=44)
MOD/AUX (n=4)	0	15.38	27.84
COMP (n=4)	2.94	50	61.93
NEG (n=4)	0	11.53	26.13
QUANT/NUM (n=4)	3.67	34.61	50.56
TOTAL (n=16)	1.65	28.36	41.61

Switching at functional junctures

The ensuing discussion reviews the total responses for each category type, commencing with those items that incorporated switching after functional elements, shown in Table 1. A one-way Anova was performed to compare the means of acceptability across the three groups (significance $p<.05$), and a Tukey post hoc was performed to more precisely isolate the differences.[41] With respect to switching between the functional element MOD/AUX and its complement, these analyses indicate that the Advanced group participants pattern significantly differently ($p=.0085$) from Beginners, though no significant difference was revealed between the Beginners and Intermediates nor between the Intermediate and Advanced groups. Analyses of test items incorporating switching between the functional element COMP and its complement revealed a significant

[39] Of course, as Universal Grammar is by definition not readily accessible to conscious reflection, the value of introspective judgments may be questioned (cf., e.g., Birdsong, 1992, 1994; Sorace, 1996). Speaking specifically to the methodology, one reviewer notes, "It is hard to see how this kind of data could lend support to the claim that code-switching is constrained by principles of UG other than to rule out conscious knowledge", a point well taken. Still, such judgments may provide confirmation of proposed syntactic constructs. In like manner, reaction times – e.g., as measured by Rakowsky (1989) and Sunderman (1996, 1998) discussed above – attest to variations in processing, which we interpret as providing evidence of grammatical differences in stimulus sentences.

[40] These items concerned negation/*do*-support:
(i) a. *La biblioteca normalmente no* opens on Sunday mornings. (The library normally does not . . .)
b. *La biblioteca normalmente* not opens on Sunday mornings. (The library normally . . .)
(ii) a. The physics student does not *va al laboratorio los fines de semana*. (. . . go to the laboratory on the weekends)
b. The physics student does *no va al laboratorio los fines de semana*. (. . . not go to the laboratory on the weekends)

[41] I am grateful to Gretchen Sunderman for her assistance with the statistical analysis of the data.

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contrast (p=.0072) between Advanced versus Beginners and Intermediates, though no significant difference was observed between the latter two groups. Looking to switching between the functional element NEG and its complement, no significant differences were found among the participants; the sub-sets were homogeneous (p=.236). And analyses of switching between the functional element QUANT/NUM and its complement indicate that Advanced participants demonstrated a significantly different pattern of responses (p=.0041) from their Beginner and Intermediate counterparts, though again there was no significant difference found between the latter two groups. Finally, reviewing the overall responses for switching at the boundary between a functional element and its complement, the one-way Anova and Tukey post-hoc showed a significant result (p=.0000): Advanced participants patterned significantly differently from Beginners, though there was no significant difference in the patterns of responses of Beginner versus Intermediate participants.

Table 2. *Acceptance of switching between lexical elements and their complements (%)*

	Advanced (n=34)	Intermediate (n=26)	Beginner (n=44)
PREP (n=3)	84.31	69.23	73.48
NOUN (n=1)	73.52	61.53	72.72
VERB (n=9)	93.46	76.49	78.03
ADJ (n=2)	70.58	21.15	32.95
TOTAL (n=15)	87.25	66.66	70.75

Table 3. *Acceptance of switching between the subject and predicate (%)*

	Advanced (n=34)	Intermediate (n=26)	Beginner (n=44)
Subject/Predicate (n=2)	97.05	75	78.4
Adjunct modifiers (n=9)	97.71	87.17	82.82
TOTAL (n=11)	97.59	84.96	82.02

Switching at lexical junctures

Distinct patterns emerged in responses to code-switching between lexical elements and their complements. As shown in Table 2, the overall rates for acceptance of switching between lexical elements PREP, NOUN, VERB, and ADJ and their complements was high for all participants. One-way Anova and Tukey post hoc tests reflect no significant differences among the sub-sets (p=.0916) for switching between PREP and its complement. There were too few data points to subject the data on switching between NOUN and its complement to statistical analysis. For items incorporating switching between VERB and its complement, analyses indicate that Advanced participants pattern differently from Beginners and Intermediates (p=.0119). Lastly, switching between ADJ and its complement revealed homogeneous sub-sets (p=.1314), perhaps owing to the small number of tokens. Overall, there was an interaction between level of competence and patterns for switching between lexical items and their complements, with the Advanced group performing significantly differently from Beginners and Intermediates (p=.0093).

Switching at other major junctures

Table 3 represents acceptability responses for switching at various other syntactic boundaries. The one-way Anova and Tukey post hoc analyses indicate homogeneous sub-sets for switching at the boundary between the subject and predicate; and patterns of responses to switching of various types of sentential and verbal adjunct modifiers were shown to be significantly different (p=.0044) for Advanced versus Beginner and Intermediate participants, though there was no significant difference between these latter groups.

Cross-category comparisons

Lastly, Table 4 summarizes the difference in acceptability rates for switching at the junctures between functional elements and their complements as compared with switching in other contexts. As presented, Advanced participants differed from Beginners and Intermediates on responses to switching at the junctures of functional, lexical, and clausal elements. Of equal interest are within-group comparisons of switching at these distinct sites. Beginners' responses on switching at functional junctures were significantly different from their responses to switching at non-functional sites (p=.0002); Tukey post hoc tests revealed no difference between switching at lexical versus clausal junctures. Intermediate and Advanced participants patterned alike: their acceptability responses were significantly different in all three junctures – functional versus lexical versus clausal – with p=.0000. Overall, our participants distinguished switching at functional junctures from switching at other constituent boundaries; and Intermediate and Advanced participants additionally demonstrated a sensitivity to switching at lexical versus clausal sites.

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Table 4. *Acceptance of switching across stimuli (%)*

	Advanced (n=34)	Intermediate (n=26)	Beginner (n=44)
Functional (n=16)	1.65	28.36	41.61
Lexical (n=15)	87.25	66.66	70.75
Clausal (n=11)	97.59	84.96	82.02

Introspective survey

The remarks offered by all of the participants to the elicitation of introspection referenced various aspects of code-switching behavior and form, and will not be fully reproduced here; sample observations concerning general properties of code-switching and particular syntactic junctures appear in (41)–(48).

(41) Sample comments referencing general properties of code-switching
  a. "I try not to code-switch myself, so I don't have much practice. But amazingly enough, it was easy for me to pick the code-switching sentences that sounded good." (Advanced)
  b. "The ones that I found unacceptable were sentences that didn't sound right at all – bad English and bad Spanish." (Intermediate)
  c. "When the form of the verb in Spanish does not correspond to English, it is not acceptable." (Intermediate)
  d. "On most of the sentences, I felt that both of the two [sic] sentences were acceptable. I felt that most of the two sentences said the same thing. Often, one sentence had a word in English, and the other had the same word/meaning in Spanish." (Beginner)
  e. "Responses are not random. In general, I think I tried to preserve English grammar structure." (Beginner)
  f. "I think that in most cases, the more English there was the more acceptable it sounded." (Beginner)

(42) Sample comments referencing Modals/Auxiliaries
  a. "Sometimes in the translations if English words, like 'does', were missing I marked it as incorrect." (Intermediate)
  b. "My answers were fairly consistent. It didn't sound acceptable to split verbs like 'have elected' down the middle." (Intermediate)

(43) Sample comments referencing Complementizers
  a. "*Que* should remain with the whole phrase." (Advanced)
  b. "When the difference is *que* or *that* it doesn't really matter." (Intermediate)
  c. "The sentences that the only difference was *que* or *that*, they both sounded acceptable to me." (Beginner)

(44) Sample comments referencing Negation
  a. "The sentences with *no* or *not* sound really bad. The adverb should be in the same language as the verb." (Advanced)
  b. "When there is a *no*/not before the verb it sounds weird." (Intermediate)
  c. "I found that most were acceptable. The ones that I did not agree with usually had a negative in it." (Beginner)

(45) Sample comments referencing Quantifiers/Numbers
  a. "Number words don't seem to split up. (Advanced)
  b. "I found it acceptable when the Spanish and English translations of a number were used interchangeably." (Beginner)

(46) Sample comments referencing subject/predicate and verb/object
  a. "The sentences in which the subject or object is separated from the verb were preferable." (Advanced)
  b. "The sentences I reported as acceptable are the ones that had the subject in Spanish and the rest of the sentence in English or vice versa." (Beginner)

(47) Sample comments referencing Adjectives
  a. "I prefer that the speaker stay with one language for 'natural' parts of the sentence. For example, I like it better when the Spanish adjective is used to describe a Spanish noun, and English adjectives with English nouns. I guess I like it when the Spanish form is used with Spanish words, and vice versa." (Advanced)
  b. "Word groups, modifiers all in one language – *the proud student*, not *the estudiante proud*." (Advanced)
  c. "I don't like switching in the middle of a verb compound or where the adjective would end up on the wrong side of the noun." (Advanced)
  d. "If adjectives and the nouns they were modifying were in two different languages then I would put not acceptable." (Intermediate)

(48) Sample comments referencing Nouns
  "In general, nouns sound find in both languages." (Beginner)

Discussion and synthesis

As noted throughout, syntactic principles are formulated in terms of negative constraints on the grammar, and, therefore, eliciting judgments about ungrammatical sentences proves particularly significant in the evaluation of grammatical knowledge. This in mind, we recapitulate the results for those test items predicted to be ill formed by the Functional Head Constraint; rejection of these items can be imputed to the operation of such a universal principle. Based on their rejection of sentences predicted to be ill formed by the Functional Head Constraint, we conclude that the Advanced participants have access to the grammatical knowledge that includes the information necessary for rendering a judgment on the impossibility of these code-switched forms. In marked contrast, the Beginners do not appear to

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render such judgments on the basis of abstract linguistic principles. Unlike the Advanced participants, who rely on unconscious linguistic knowledge to assess the status of ill-formed code-switched sentences, the Beginners appear to employ a strategy of translation in assessing the grammaticality status of code-switched sentences. The Intermediate group manifested response behaviors similar to those of both the Advanced and Beginners, though statistically indistinguishable from the latter. In brief, the judgment task seemed to require them to draw on knowledge that they had not yet fully mastered. Therefore, though they demonstrate some tendency to rely on innate knowledge in rendering their judgments, resulting in the higher percentage of accurate judgments than their Beginner counterparts (i.e., rejection of forms that are in violation of the Functional Head Constraint), their scores did not approximate those of the Advanced participants and were statistically distinct from them. These findings do not impugn the validity of the acceptability judgment task for the Intermediate and Beginner participants; rather, the results make evident that these less advanced learners do not have complete access to the grammatical knowledge that must be invoked in making these judgments. For the Advanced participants, this grammatical knowledge includes the abstract features to which the Functional Head Constraint makes reference.

There was, nonetheless, one notable counterexample to the predicted pattern of acceptance/rejection of specific instances of intra-sentential code-switching, even among the responses proffered by the Advanced participants. As shown in Table 2, all participants demonstrated markedly reduced rates of acceptance for items that incorporated switching between the lexical element A and its PP complement, contrary to predictions. This could likely owe to the small number of data points for this item. We note, however, that switching in the context of adjectival modification was generally rejected, though it also merits pointing out that participants' acceptance of switching before a predicate adjective contrasted with the restrictions against switching between non-equivalent noun–adjective or adjective–noun boundaries (and participants of all levels would subsequently comment on the unacceptability of switching of simple adjectives).[42] Still, as the Functional Head Constraint makes correct predictions for the overwhelming majority of cases, this counterexample should not induce us to reject it immediately, but incite us to additional theoretical and empirical study on the positional licensing of adjectives in intra-sentential code-switching (cf., fn. 26).

Further corroborating the Functional Head Constraint were participants' reflective responses in the introspective survey. While it is true that the Advanced participants' responses could merely reflect their superior metalinguistic knowledge, what is material is that their responses referenced the ill-formedness of particular items, whereas those of the Beginners' pointed to the acceptability of well-formed (and ill-formed) sentences, confirming the diminished code-switching competence of the latter. The Advanced participants' reports of their introspection on code-switching judgments were most candid and informative. Some purported to refrain from code-switching in their own speech, and others reported negative evaluations of code-switching in the speech of others. Nevertheless, all Advanced participants recognized that code-switching demonstrates grammatical patterns, and one astute respondent observed that grammatical norms are to be found among "fluent" bilinguals.[43] The majority of responses from Advanced participants reference the unacceptability of switching across the boundary between a functional element and its complement. Several respondents commented on the unacceptability of code-switching where the adjective and

[42] Witness the diminished response rates for two test items in (i–ii) that incorporated a prenominal qualifying adjective (n=2): Advanced 10.29%, Intermediate 26.92%, Beginning 40.9%. For these simple, adnominal adjectives, statistical analyses revealed homogeneous subsets (p=.7726), again, probably due to the small number of tokens.

(i) a. *La maestra cansada* from long hours of study fell asleep during the meeting. (The teacher tired . . .)
b.* The overworked *maestra se durmió durante la reunión*. (. . . teacher slept during the meeting.)

(ii) a. The student proud *de sus éxitos celebraba en San Antonio*. (. . . of his accomplishments celebrated in San Antonio.)
b.* The student *orgulloso celebraba en San Antonio*. (. . . proud celebrated in San Antonio.)

It merits recalling that in their analysis of modification structures, Mahootian and Santorini (1996) propose free Chomsky-adjunction of adnominal adjectives, such that nouns and adjectives from one language may appear in positions that are specific to the grammar of the other, thereby predicting the acceptability of switches such as *la mujer proud* / *the proud mujer* / *the woman orgullosa* / *la orgullosa woman*. However, this proposal is untenable, as it is counter to what is noted in the research literature on Spanish–English code-switching (cf., Toribio, 2001).

[43] As many of these students were preparing for careers in education, I expected that prescriptive norms would prevail in their judgments. Yet the findings confirm that negative value judgments concerning code-switching as a viable linguistic variety in bilingual speech communities are not reflective of linguistic discrimination regarding grammatical form, but rather suggest a dim view of code-switching as a social practice (cf., Toribio, 2000a).

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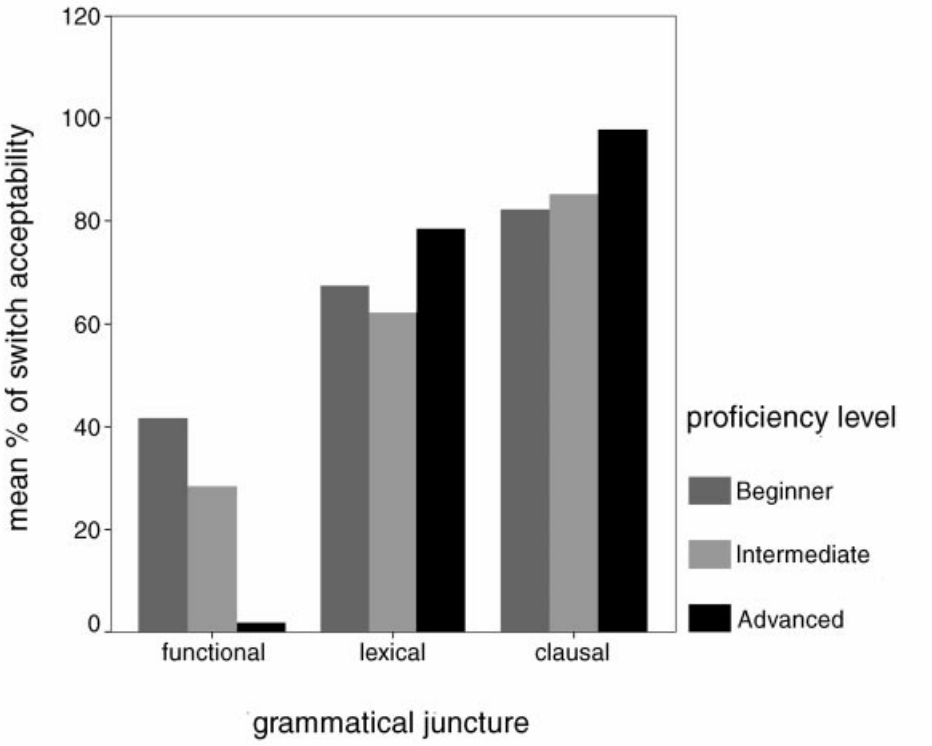


Figure 1. Bar-graph of acceptability across syntactic junctures

noun do not obey the word order requirements of the grammar from which they are drawn. There were fewer comments regarding switching between a lexical category and its complement, as expected, given the well-formedness of code-switching in this context. Of these, most pertain to switching at the VERB boundary, with participants indicating a general acceptance for switching between subject and predicate, and between VERB and its object.

In contrast, Intermediate participants demonstrated less acumen than the Advanced participants in their responses. While most Intermediates believed their judgments to have been non-random, they experienced difficulty in articulating the factors that led to this characterization and entered into the formulation of their judgments. Some commented on the unacceptability of switching at specific junctures, most frequently focusing on MOD/AUX and adnominal ADJ, and others commented on the grammaticality of the fully English and fully Spanish equivalents of the code-switched sentences. But, more generally, the responses of the Intermediate learners reveal a lack of analysis, or of adequate expression. In like manner, the Beginner participants' reports on their introspection demonstrated diminished discrimination. Many of these participants reported that they found both items in the test pairs acceptable and others reported their responses to be "basically random". Several of the Beginners remarked on having rendered judgments on the English translations of the code-switched sentences, i.e., there was a demonstrated need to "preserve the English grammar structure", because the code-switched and fully English translation were interpreted as "meaning the same thing". These latter participants' comments regarding switching at specific linguistic junctures were reduced in number and in scrutiny. They pointed to the acceptability of single noun insertions and of switching at major clausal boundaries, e.g., between subject and predicate.

To recapitulate, the rule-governed nature of code-switching is upheld by even the non-fluent bilinguals in the sample, whose behavior suggests at least enough incipient competence in the second language to switch codes. As graphically exemplified in Figure 1, the Beginner and Intermediate learners rendered judgments that indicated an emergent sensitivity to f-selection: switching at the juncture between a functional element and its complement is less acceptable than switching at other sites; the differential is statistically significant. The graph makes explicit the correlation between speakers' increased bilingual competence and their ability to make well-formed-

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ness judgments for strings predicted to be ill-formed by the Functional Head Constraint.

Thus, there are indeed constraints on intra-sentential code-switching, which may be captured by the Functional Head Constraint; however, strict adherence to the constraint is related to degree of bilinguality. By way of final example, consider the test item reproduced in (49):

(49) **Los estudiantes han* elected a new representative.
"The students have elected a new representative."

In this test item, the perfective auxiliary is articulated with features referencing the phonological, syntactic, and semantic features that are consistent with the sub-class of Spanish lexical items. As a functional element, it selects and merges with (in psycholinguistic production terms, read: activates) a complement that shares its language index. However, in this example, the past participle is articulated with English-language features. As there is a mismatch between the functional element and its complement, the resultant derivation is illicit. This judgment of unacceptability is rendered by all of the Advanced participants, who possess a more fully articulated second language grammar (0% indicated acceptance of this item). However, the Intermediate learners demonstrate some variability in their acceptability judgments (15.38% indicated acceptance of this item), reflecting incomplete functional feature specification in the second language. More significantly, this item is judged to be acceptable by 38.63% of Beginner participants, who may interpret the auxiliary within the English-language system; as the lexical items are reinterpreted with native language features, this is equivalent to a judgment for the comparable sentence in the native language, as many participants expressed in the verbalization of introspections, such as, "the word left in English was a direct translation in the Spanish version, making both phrases sound correct".

In sum, the Functional Head Constraint is revealed to be most faithfully observed by the Advanced participants, i.e., those who have acquired sufficient bilingual competence (read: abstract feature specification). These emerging profiles, when considered in the light of participants' success on the grammatical acceptability questionnaire, further confirm our hypothesis and corroborate previous research that indicates that bilinguals with a higher degree of balance of competence in the two component languages exhibit a greater sensitivity to the nuances of different code-switching patterns than their less fluent counterparts. Moreover, we can note that the acceptability judgment task revealed results consistent with those of the elicited imitation employed in Toribio et al.'s (1993) pilot study, i.e., there is a considerable degree of consistency in participant behavior across these methodologies. Therefore the issue of the reliability of second language acceptability judgments has been addressed – sentence judgments do, in fact, measure what they are purported to measure (cf., Aguirre, 1985).[44]

Significance of the results

The findings of the present study cast doubt on previous works whose results have been construed as indicative of a general inaccessibility of Universal Grammar in second language learning. Moreover, as cogently argued in Dekydtspotter et al. (1997, 299), the question of whether or not adult learners have access to universal principles is now moot: the tenets of the Minimalist Program entail that "access to the computational principles deriving the L1 is indistinguishable from access to UG".[45] Couching our findings within the Minimalist framework, we interpret our learners' judgments as verifying that a universal computational system is available in second language acquisition, and the interlanguage variability that is manifested in these judgments is explained by reference to the articulation of the lexicon, as suggested in Toribio and Rubin (1996a).[46]

Recasting Toribio and Rubin's proposal in light of our findings, the indeterminacy that characterizes the well-formedness judgments of Beginners owes to their failure to encode second language items with second language features. The linguistic systems of the Intermediate learners are likewise in flux, though UG-constrained, because their lexical specification and differentiation may be imperfect; i.e., these learners may possess incomplete knowledge, demonstrating only a subset of the requisite formal features of the target items (cf., Levelt, 1989 for related discussion from psycho-linguistics). In contrast, Advanced learners demonstrate a sufficiently well-articulated lexicon of items that may be identified as belonging to sub-classes that delimit distinct grammars; therefore, they will not only be more fluent in the component languages, but will demonstrate Universal Grammar effects in their code-switching

[44] Also addressed is the equally important matter of the validity of learner judgments: not only are the judgments consistent, but they are predicated on abstract linguistic principles rather than on prescriptive norms.

[45] The issues surrounding the much debated question of the accessibility of Universal Grammar in adult second language acquisition are rehearsed in White (1996). For discussion and rejection of views of partial access and no access, see Flynn (1996).

[46] Consult Rubin and Toribio (1995, 1996) for development of the proposal for bilingual first language acquisition.

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behavior. In other words, advanced speakers have access to the abstract lexical properties that drive syntactic derivations and license representations of the target grammars and also preclude violations in code alternations.[47] Thus, we concur in Meisel's (1994) affirmation that rule-governed code-switching cannot be attested in incipient bilingualism because one significant precondition for its emergence is not satisfied – the prerequisite of two sufficiently articulated and distinct grammars (cf., Rubin and Toribio, 1996; Toribio and Rubin, 1996a).[48]

The developmental cline hypothesized by Toribio and Rubin, and confirmed here, is compatible with Herschensohn's (2000) Construction model of second language acquisition. Like Toribio and Rubin, Herschensohn asserts that second language acquisition is not fundamentally distinct from first language acquisition. On her view, adult acquisition represents a relearning process that consists in three stages, progressing from transfer of the native-language settings, through underspecification of morphological features, to more native-like feature specifications and derivations. Although these proposed stages cannot be neatly defined, what is significant is that the acquisition of the lexicon is assumed to constitute the major task of the learner, and "grammatical realignment" is a function of mastery of lexical features of the functional categories of the second language. In fact, the conformity of Constructionism with Toribio and Rubin's developmental model is made explicit by Herschensohn: reinterpreting her proposal in Toribio and Rubin's terms, she states, "L2ers can be seen to be multi-competent, albeit incomplete bilinguals, who build their knowledge through the acquisition of the morpholexicon with all of its features" (2000, 222). In other words, the major difference among learners resides, again, in the articulation of the lexicon.

Conclusion

Taking a broader view, the present work makes evident the potential merits of the study of code-switching for formal linguistics in elucidating aspects of grammatical theory and language acquisition. The results reported here provide strong experimental evidence in support of the Functional Head Constraint as characterizing language alternations. In addition, in analyzing the competence of second language learners, the work takes up several issues, among these, the availability of universal principles, the primacy of the lexicon in the acquisition process, and the role of functional feature specification in second language attainment. More generally, the work brings code-switching to the fore. Such an achievement is of particular importance, given the widespread ignorance of bilingual speech modes in current theorizing. For in as much as the generativist program is concerned with the limits of *all* human language, comprehensive studies that explore native and second language bilingual code-switching competence from a properly syntactic-theoretical perspective are few in number indeed.

[47] Toribio and Rubin (1996a) further suggest this cline parallels that from insertional to alternational code-switching.

[48] One reviewer suggests that specific placements on a scale of bilinguality could be correlated with individual response types. Toribo and Sunderman (2001) are exploring this possibility with reaction time measures of sentence processing. The work is based on the pilot results of King, Toribio and Villarreal (1988), who proposed an implicational hierarchy of constraints for distinct syntactic sites among bilinguals of differing degrees of balance/competence.

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