Age of Onset of Exposure in Codeswitching

by

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ABSTRACT

Codeswitching, or the bilingual practice of switching between two languages, is a frequently misunderstood phenomenon in many fields, including education. Given the growing number of bilingual students and English Language Learners in U.S. schools, it is imperative that the field of education be informed by current research in bilingualism and language acquisition, including codeswitching. Codeswitching that occurs within a sentence is subject to specific rules derived from the languages involved in the switching. Furthermore, a codeswitcher's intuitions about the grammatical acceptability of certain switches over others, called grammaticality judgments, provide linguists with a unique window into how the language systems interact.

In current codeswitching research, it is sometimes claimed that simultaneous and early sequential bilinguals provide more accurate grammaticality judgments than late sequential bilinguals. Although this claim is largely motivated by Critical Period Hypothesis research, the grammaticality judgments of the three groups of bilinguals have yet to be systematically compared to determine if there is a difference in judgments. This dissertation investigates potential differences in intrasentential codeswitching patterns of simultaneous, early sequential and late sequential Slovak-English bilinguals (N = 39) through a comparison of grammaticality judgments. Analysis of potential differences is grounded in generative approaches to first and second language acquisition. Grammaticality judgments from Slovak-English bilinguals were

elicited through a survey of constructed items. Chi square results are analyzed to determine variation in judgments attributable to bilingual group based on age of onset of exposure to English.

In addition, a sub-study of data from the Welsh-English Siarad Corpus (http://www.siarad.org.uk/siarad.php) is presented. Normed token means for English and mixed tokens for simultaneous, early sequential, and late sequential bilinguals are compared using ANOVA tests, and variability is discussed in light of relevant theoretical considerations.

Results from this study indicate that there are few differences attributable to age of onset of exposure, thus helping to clarify current practices in codeswitching research methodology, particularly in terms of identifying characteristics of participants. The study also addresses issues surrounding the critical period hypothesis and the effect of age of onset of exposure in bilingualism, topics which are both directly relevant to the field of education.

This dissertation is dedicated to Daniel and Zoe, without whom there would be no Slovak-English codeswitching in my life. The study has also been completed in fond memory of my mother, who knew so early on how long I would be in school.

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Introduction

Codeswitching (CS), or the bilingual practice of switching between two languages during a conversation or even within a sentence, is a frequently misunderstood practice in many fields, including education. Given the number of bilingual students and English Language Learners in U.S. schools, it is imperative that the field of education be informed by current research on bilingualism and language acquisition, including CS. For instance, CS, like any natural language, must follow certain rules and patterns in order to be grammatical when it occurs below the level of a sentence (specifically a Complementizer Phrase), referred to as intrasentential codeswitching (MacSwan, 2000; Poplack, 1980). Furthermore, a bilingual who engages in intrasentential CS demonstrates intimate knowledge of the two language systems and how they interact (MacSwan, 1999). Subsequently, a codeswitcher's intuitions about the grammatical acceptability of certain switches over others, determined through grammaticality judgment tasks, provide linguists with a unique window into how languages systems interact.

In current CS research, it is sometimes claimed that simultaneous bilinguals (both languages learned in infancy) and early sequential bilinguals (one language learned in infancy and a second during early elementary school years) provide more accurate grammaticality judgments than late sequential bilinguals (one language learned in infancy and a second during or after puberty) (for instance, MacSwan 1999, 2005; Toribio 2001). Although this claim is largely motivated by Critical Period Hypothesis research (see Chapter Two discussion of

Birdsong, 1992; White, 2003; and others), the grammaticality judgments of these three groups of bilinguals have never been compared to determine if there is a systematic difference in judgment.

To address this critical gap in the research literature, this dissertation will explore several broad theoretical questions. To begin with, the central aim of this study is to determine to what extent age of onset of exposure to a language may affect grammaticality judgments in CS. In other words, can we empirically demonstrate, as others have (MacSwan 1999, 2005; Toribio 2001) have supposed, that the grammaticality judgments of late sequential bilinguals differ from simultaneous and early sequential bilinguals, a possible reflection of a differing underlying grammatical system? If the grammaticality judgments of late bilinguals do tend to reflect a different underlying grammar, does this generalization hold for all members of the group, or do certain (types of) late bilinguals provide grammaticality judgments that are consistent with simultaneous bilinguals? In a more likely scenario, can we assume that differing grammaticality judgments of codeswitches represent certain structures which are susceptible to age of acquisition effects? In a broader theoretical context, differences in grammaticality judgments may inform us about differences in early and late sequential bilingualism and may also provide insight into differences in simultaneous and early sequential bilingualism.

To answer these questions, this dissertation employs a series of grammaticality judgment tasks to investigate potential differences in

intrasentential CS patterns of simultaneous/early sequential and late sequential Slovak-English bilinguals (N = 39). It is hoped that results from this study will not only clarify current practices in CS research methodology, but also address issues surrounding the critical period hypothesis and the effect of age of onset of exposure on second language acquisition, topics which are both directly relevant to the field of education.

Types of Bilinguals

Being bilingual is a defining factor in CS, and bilinguals can be classified by any number of characteristics. Grosjean (1998) presents a comprehensive discussion of several factors used to define bilinguals, including fluency, language history, language stability, and demographic data. Bilinguals are also frequently classified based on when they became bilingual, particularly in acquisition studies. For example, children who are raised from birth in a bilingual environment, generally as a result of having bilingual parents or a parent/caregiver who speaks another language, are referred to as simultaneous bilinguals. For simultaneous bilinguals, acquisition of each language occurs at relatively the same time and falls within the scope of first language acquisition (FLA). It is generally assumed that simultaneous bilinguals will have native-like fluency in both languages, as long as language development is continued, though one language will typically be more dominant than the other.

Bilinguals who are raised in a monolingual environment but learn a second language later on in life, whether as a child or an adult, are referred to as

sequential bilinguals. In the case of sequential bilinguals, the second language is acquired after the grammatical system of the first language has reached an adult-like state, thus making language acquisition sequential. In comparison to simultaneous bilinguals whose bilingual language development falls with the scope of FLA, the first language of sequential bilinguals is considered to be a product of FLA while the acquisition of their second language is usually considered to be second language acquisition (SLA).

Sequential bilinguals can be further divided into two groups – early sequential and late sequential. Early sequential bilinguals learn their second language early enough in their life, generally around the school-entering age, that there is presumably still full access to UG, thus explaining why many early sequential bilinguals attain native-like competency in their second language. For instance, a child who is raised in a minority language home will learn the minority language as a first language. However, that child may also have to learn a majority language once s/he enters school at the approximate age of five. The child must then learn the majority second language well enough to succeed in an academic environment, while continuing to speak the minority first language at home.

Late sequential bilinguals, on the other hand, are those bilinguals who learned their second language approximately during or after puberty, when UG is presumably no longer available. Sometimes referred to as adult second language learners, late sequential bilinguals rarely reach native-like fluency in all domains

of the second language. Late sequential bilinguals vary in ultimate attainment, with many experiencing fossilization and L1 influence in phonology, lexical knowledge, syntax, and/or discourse strategies. Despite this, many late sequential bilinguals successfully use their second language in daily interactions in their jobs, with their children, and with their friends, suggesting that they are actually bilingual, even if their second language is not native-like.

Labeling bilinguals as simultaneous, early sequential, or late sequential assumes that FLA, and full access to UG, ends at a specific time for all language domains for every person. In the case of early sequential bilinguals, it even assumes that a child can be undergoing first and second language acquisition simultaneously, given that certain aspects of FLA have been shown to extend into the teenage years (Keijzer, 2009, for instance). This admittedly problematic distinction is based on the assumption of a critical period, particularly in SLA in terms of the Critical Period Hypothesis (CPH). Work in SLA, FLA and the CPH has shown that the critical period itself is most likely more parameter specific rather than universal (White, 2003) and that early sequential bilinguals may have more adult-like development in both languages than simultaneous bilinguals (Montrul, 2008). (See Chapter Two for further discussion of these and related issues.)

Despite the theoretical problems associated with the simultaneous and sequential distinctions, I still employ the classifications of simultaneous, early sequential, and late sequential in my study. The distinctions are pervasive in the

field of bilingualism and many assumptions about a bilingual's ability are rooted in these labels. Additionally, the distinctions have also surfaced in the current debate about accuracy and reliability in CS, which is the topic of this dissertation. For these reasons, participants in this study are grouped according to the simultaneous/sequential distinction.

Definitions of Codeswitching

Codeswitching, as defined by Milroy and Muysken (1995, p. 7) is the "alternative use by bilinguals of two or more languages within the same conversation." Although this definition is very general, it suffices to illustrate a phenomenon that many bilinguals, and those who spend time with bilinguals, recognize as common. In conversations with other people who speak the same languages, bilinguals will generally mix their languages in a variety of ways.

The Slovak-English CS example in (1) illustrates switching above the sentence level, and is referred to as *intersentential* CS, which serves a number of discursive purposes.

(1) *Ø nikdy ne-vie-š čo Ø je-š .* So what?
pro never NEG-know-2.S what pro eat-2.S So what
'You never know what you are eating. So what?'
(McAlister, 2005)

For instance, within the context of CS in educational settings, Ncoko, Osman, and Cockcroft (2000) analyzed CS in terms of eight functions for children in non-academic discussions in the classroom, while Reyes' (2004) study of

children's talk in academic and non-academic contexts analyzed CS into twelve different functions for the children in her study. Further, many extralinguistic variables influence intersentential CS in the classroom, including participants in the conversation, social roles, and identity (Ferguson, 2003).

On the other hand, CS that occurs within a sentence is referred to as *intrasentential* CS and is constrained by the grammatical properties of the languages involved. An example of intrasentential Slovak-English CS is given in (2), which demonstrates how CS can occur within preposition phrases (***v*** *strip mall*), as a noun phrase (***je*** *sushi restaurant*), and as an adverbial phrase (***hned*** *next door*).

(2) *V* strip mall *tam* *je* sushi restaurant *a* *hned*
LOC strip mall there be-3.S sushi restaurant and immediately
next door *rybarka* exotic fish shop
next door fish store exotic fish shop
'there's a sushi restaurant in the strip mall there and right next door a fish store, an exotic fish shop.'
(McAlister, 2005)

It is important to note here that the switches in (2) do not violate any grammatical rules of either Slovak or English. Because of the role of grammatical constraints in intrasentential CS, much of the research on this type of CS has traditionally focused on its syntax. CS researchers have proposed many accounts of

instrasentential CS, though more recent approaches, particularly based in Minimalism, have been more successful, as will be discussed in Chapter Two.

Rationale for the Study

As noted, Belazi, Rubin, and Toribio (1994), MacSwan (1999, 2005), and Toribio (2001) have argued that CS research should focus on simultaneous bilinguals. Belazi, Rubin, and Toribio (1994) propose that CS research should be limited to "fluent bilinguals" (p. 222), and MacSwan (1999, 2005) suggests that studies like Johnson and Newport (1989) indicate that a second language may be represented differently in the mind of the second language learner (2005, p. 2). Other CS researchers, such as Mahootian (1993), Fuller and Lehnert (2000), and Jake, Myers-Scotton, and Gross (2002), have relied on second language learners, that is, late sequential bilinguals, for CS data, while Gross (2000) cites data from heritage German-English bilinguals undergoing attrition in German. This presents an interesting dilemma in the field. If not all bilinguals provide the same kind of CS data, perhaps due to a critical period in second language acquisition, then CS researchers who rely on second language learners and late sequential bilinguals have different data than those who rely on simultaneous and early sequential bilinguals. If, on the other hand, there is little or no difference in the CS of late sequential bilinguals, then researchers who rely solely on simultaneous bilinguals are not exploiting the full scope of the data and informants available to them. An additional effect of this dilemma is evident in counterexamples, which are also rarely identified by age of onset of exposure. Clearly, the relevance of a

counterexample would have to be further elaborated if there is a difference in CS attributable to age of onset. Since the comparability of data from the three groups of bilinguals (simultaneous, early sequential, and late sequential) remains to be explored, it is difficult to evaluate the reliability of conclusions reached from late bilingual data or the exclusion of late bilingual data from CS research.

Overview of Chapters

Chapter One has offered a brief introduction to the rationale of this study. Beginning with a cursory discussion of the methodological issue regarding age of onset of exposure and CS, the chapter continues with an overview of the three types of bilinguals – simultaneous, early sequential, and late sequential – investigated in this study. An introduction to foundational concepts of CS is also provided, and the chapter concludes with an overview of the remaining chapters.

Chapter Two offers a literature review of a range of topics relevant to the present study. Various approaches to the study of CS are reviewed, including Muysken's (2000) typology, the Matrix Language Framework (MLF) (Myers-Scotton, 1993, 2002), and Minimalist approaches to CS (MacSwan, 1999). Particular attention is paid to the MLF, as it is often offered as an alternative to Minimalist research in CS. Recent debate has contrasted the two approaches (Jake, Myers-Scotton & Gross, 2002, 2005; MacSwan, 2005), and demonstrated that the Minimalist approach offers a more fruitful research platform than the MLF. Reasons for preferring a Minimalist approach are outlined in detail,

including theoretical criticisms of the MLF, and the historical development of the Minimalism Program (MP) and current areas of research are reviewed.

The effect of age of onset of exposure in CS, as defined by type of bilingual, is addressed by briefly examining what is currently known about the Critical Period Hypothesis in second language acquisition (SLA), with particular attention paid to the role of Universal Grammar (UG) in SLA. In complement, Montrul's (2008) recent work in incomplete acquisition in bilingualism is also discussed, with a focus on differences between simultaneous and early sequential bilinguals. Finally, what is known about CS in sequential bilinguals is also presented.

Chapter Two then briefly examines relevant aspects of Slovak grammar. While Slovak is broadly discussed, the section focuses primarily on those properties that are represented in the survey instrument used in this study. In particular, the gender and case system are described, along with prepositions and the verb system.

Chapter Three presents the research questions for the study. The primary research question centers on whether Slovak-English codeswitchers evidence differences in grammaticality judgments as a function of onset of exposure to English. In addition, exploring other datasets, such as the Siarad Corpus (http://www.siarad.org.uk/siarad.php), provides additional data for addressing the effect of age of onset of exposure in CS.

The research methods of the study are also addressed in Chapter Three, including the data collection and instrumentation, the development of the scale, and the participants. The types of the judgment tasks as well as the general syntactic contexts of the tasks are also addressed. Chapter Three also discusses the statistical analyses which will be employed in the study. The sample (N = 39) is grouped according to age of onset of exposure to English, and the units of measurement in this study include age of onset, grammaticality judgments, attitudes toward CS, and language learning history. The independent variable is type of bilingual, as evidenced by age of onset of exposure (simultaneous, early sequential, or late sequential), while the dependent variable is the participant's judgment about the acceptability of the test items. Given the nature of the groups and the categorical dependent variable, the relevant Chi Square design and hypotheses are also described.

Chapter Three further presents an overview of the research methods used in the sub-study of the Welsh-English Siarad Corpus, where the independent variable is also type of bilingual (simultaneous, early sequential, or late sequential). In this sub-study, the dependent variables are the normed English and mixed tokens per thousand, as evidenced in the corpus. As the dependent variables are continuous, the sub-study employs an ANOVA rather than a Chi Square.

The resultant analyses are presented in Chapter Four. The central research question is addressed by examining the effects of age of onset of exposure in

variation in judgments. Finally, evidence from other datasets is investigated through the examination of by data from the Siarad Welsh-English corpus (http://www.siarad.org.uk/siarad.php), particularly focusing on variability in CS attributable to age of onset of exposure and related factors. Parallels between the two datasets are also discussed.

Finally, Chapter Five outlines the implications of the study, both for CS research and the broader field of the study of age of onset of exposure in the fields of SLA and bilingualism. Educational implications are also addressed, particularly for early and late sequential bilinguals.

Summary

This dissertation addresses several issues in the conduct of intrasentential CS research. Above all, the study explores potential differences in the CS patterns of simultaneous, early sequential, and late sequential bilinguals. It promises to make a significant contribution to our understanding of appropriate data in CS research, a topic that has not previously been empirically investigated. Additionally, the study contributes to an understanding of descriptive constraints in Slovak-English CS, a previously unstudied language pair.

Ultimately, this dissertation attempts to contribute to the broader understanding of the nature of bilingualism, particularly in the area of CS. Not only are methodological issues in CS research explored, but it is hoped that any conclusions drawn from the research could also be applied more broadly to the fields of language acquisition and education. Given the number of newly-arrived

adolescent immigrants in U.S. high schools and the learning of English as a Second Language by adolescents and adults abroad, this is especially relevant as age of acquisition issues again become prominent in understanding the nature of bilingualism.

Literature Review

Chapter Two provides an overview of the various theoretical fields that underpin this study. The first section addresses the various approaches to the study of intrasentential CS, including Muysken (1995, 2000), Myers-Scotton's MLF (1993/1997), and the generative approaches. The generative approaches are addressed from a historical perspective, starting with those based in Aspects (Chomsky, 1965) and culminating with those that fall within the scope of the Minimalist Program (MP). The second section outlines the role of age of onset of exposure in bilingualism and second language acquisition (SLA), while focusing on a discussion of the critical period hypothesis (CPH) and alternate explanations for ultimate attainment in SLA. Finally, the last section outlines the grammatical structure of Slovak, with a particular attention to the structures that appear in the grammaticality judgment survey.

Theoretical Approaches in Codeswitching

Work on intrasentential CS necessarily involves exploring the syntax of code switches, though theories of intrasentential CS may or may not rely explicitly on syntactic theory. This section will offer a brief overview of early work on CS before exploring the three current approaches in intrasentential CS research: Muysken's (1995, 2000) typological approach, the Matrix Language Framework (Myers-Scotton 1993/1997), and generative approaches, which are based on various instantiations of Chomsky's work (1965, 1981) and culminate with the Minimalist Program (Chomsky, 1995; 2007). Though others, namely

MacSwan (in press), have divided approaches into constraint-oriented and constraint-free theories, this paper will address the various approaches according to the underlying theoretical framework in order to account for the historical development of Minimalist approaches to CS.

Early Work in Codeswitching

Though many researchers cite Blom and Gumperz (1972) as the beginning of research on CS, Benson (2001) suggests that CS work in the United States actually started much earlier. For instance, Leopold (1949) documents examples of Hildegard's German-English codeswitching, but does not elaborate an explanation, while Smith (1935) (Benson, 2001, p. 27 - 28) offers similar data on a Chinese-English bilingual child. In the same time period, Barker (1947) explored social function and language choice in CS in Tucson's Mexican-American community. Benson also cites even earlier work, including Espinosa's (1914) dissertation which addresses Spanish-English codeswitching in New Mexico (p. 28 -31). Despite the availability of these works to current CS researchers, they remain largely overlooked for two main reasons (Benson, 2001). Above all, none of studies use the term *codeswitching*, but instead used differing and ambiguous terms, and all were published in somewhat obscure places (p. 33). Finally, Benson argues that most current CS researchers see "the founding body of research … as the 1960s and 1970s" and are "content with this and seem to believe there is no reason to look at anything before that time" (ibid.).

As Benson (2001) points out, the bulk of founding research in CS occurred in the 1960s and 1970s, with the majority of this being largely descriptive work. Myers-Scotton (1993) argues that Blom and Gumperz (1972) is the first major work on CS, although this work was sociolinguistic in nature. Myers-Scotton also suggests that work on CS constraints took hold in the 1970's and 1980's, with work from Timm (1975), Pfaff (1979), and Gumperz (1982), among others. These early works, whose focus on constraints MacSwan (2004) characterizes as descriptive, laid the groundwork for the approaches described below (p. 285), all of which attempt to develop a theory of intrasentential code-switching. Before exploring grammatical explanations of CS though, typological characterizations of CS, namely Muskyen (2000), will be discussed.

Muysken's Typology of CS

In an attempt to formulate an adequate framework for the comparison of various models of CS, Muysken (1995, 2000) outlines a typology of CS based on general syntactic theory. Muysken identifies three patterns of intrasentential CS – insertional, alternational, and congruent lexicalization – that vary in structural conditions, contributions to the structure, and the context the structures occur in (Muysken, 2000, p. 3). Above all, Muysken relies on general syntactic principles to categorize CS patterns, which then allows him to draw on contemporary theories in exploring why these patterns are distinct and how they relate to each other. Additionally, Muysken argues that these types of CS are the result of different processes, which are subject to different constraint conditions (2000,

p.3). Finally, Muysken refers to codeswitching as *code mixing*, because he feels that codeswitching only occurs in cases of "the rapid succession of several languages in a single speech event" (2000, p. 1), which falls under his categorization of congruent lexicalization. For consistency and simplicity, however, this overview will continue to use *codeswitching* to refer to both code mixing and codeswitching, despite how the two are distinguished by Muysken.

Insertional codeswitching.

Insertional CS involves the occurrence of a constituent from Language A in the context of Language B. Muysken is careful to point out that the constituent is structurally related to neighboring constituents, lexical items within the insertion must be structurally related to each other in order to be considered an insertion, and the constituents that are switched are small (Muysken, 2004, p. 154). Additionally, Muysken argues that one language acts as a base language in insertional CS (2000, p. 68), which he suggests can be determined by exploring the TP or the CP (p. 67). This assertion of a base language mirrors Myers-Scotton's (1993/1997, 2005) claim of a matrix language, though Muysken indicates that the base language is only relevant in certain types of CS.

Both Muysken (1995) and (2000) assert that insertional CS is mostly associated with borrowing, and he goes on to argue that borrowing is more akin to lexical sharing than CS (2000, p. 69). In order to differentiate borrowing from insertional CS, Muysken relies on language indices, similar to Di Sciullo, Muysken, and Singh (1986), which is problematic for the reasons covered below

in discussion of their work. While Muysken (2000) does extensively outline formal characteristics of borrowing, nonce borrowing, and insertional CS, the use of language indices restricts the applicability of his approach.

Alternational codeswitching.

Alternational CS involves longer stretches of code switched material, and Muysken (1995, p. 180) outlines general criteria for differentiating insertional and alternational CS. Alternational CS is more likely to occur when

1. the constituents switched do not themselves form a constituent;
2. the material switched is not embedded in (ie. preceded and followed by) other language constituents; and
3. the stretch of material switched is longer and does not form a larger constituent (as in 1.).

Furthermore, Muysken (2004) states that insertion can involve various types of constituents, including various categories, function words, complex and possibly discontinuous constituents, and "morphologically complex elements" (p. 154). Despite these criteria, Muysken is quick to point out that it is sometimes very difficult to decide whether code switched material is insertional or alternational.

Congruent lexicalization.

The final type of CS outlined by Muysken (2000) is congruent lexicalization, where the grammars of the two languages converge structurally and the CS pattern is "irregular" (Muysken, 2004, p. 154). In this case, there is no matrix language (p. 132), because the structure is shared equally by both languages.

Though this type of CS is most likely to occur between languages that are in close contact situations where the two languages have started to converge, it can also occur in any language pair that has structural similarities.

Muysken's account of CS relies soundly on syntactic criteria in identifying the type of CS, though this does not necessary contribute to explaining why certain switches are possible in a language pair while others are not. Similarly, it is hard to see exactly how this approach can be furthered without incorporating theoretical considerations that are specific to bilingual data, as in the occasional need for a base language. Since the purpose of Muysken's approach is to identify kinds of codeswitches, which are by definition bilingual, it is clear that monolingual data are not relevant for typological purposes. However, by creating a framework that can be applied only to bilingual data, Muysken's work remains a largely descriptive endeavor and fails to address more fundamental questions about how bilingual language production can successfully accommodate syntactic differences. Furthermore, this approach can only be applied in cases where models of CS are constraint-oriented (see MacSwan, in press) and therefore predictive, rather than constraint-free, which focus on explanatory principles of language.

The Matrix Language Frame Model

The Matrix Language Frame (MLF) Model (Myers-Scotton, 1993/1997, 2002) is one of three models developed by Myers-Scotton to address CS. The other two models include the Markedness Model, a sociolinguistic model for CS

first published at the same time as MLF, but not addressed here (Myers-Scotton, 1993b) and the 4-M Model, a newer morphotypological model briefly discussed below (Myers-Scotton & Jake, 2000c). The MLF has been widely used in CS research, but has also recently been challenged in terms of its theoretical assumptions and applications. While the MLF is CS specific, concepts outlined in the 4-M Model are necessary in understanding and applying the MLF, and will therefore also be addressed.

Defining codeswitching.

Although the MLF is not rooted in generative grammar theory, Myers-Scotton, Jake and Okasha (1996) define the upper boundary of CS as the CP, suggesting that

> a CP shows intrasentential CS if it includes morphemes from two or more languages in one or both of two patterns: (a) it includes a maximal projection with morphemes from two or more languages and/or (b) it includes monolingual maximal projections, but from two or more languages. (p. 11)

Essentially, CS must occur below the CP, traditionally thought of as the sentence level, and must also either contain morphemes from two languages within a projection or entire projections from two languages. This differs sharply from Myers-Scotton's (1993) original definition of CS, which starts with the sentence as the unit of analysis, though no definition of a sentence is offered, which has been theoretically problematic.

More recently, Myers-Scotton and Jake define "classic code switching" as "code switching by speakers proficient enough in all participating varieties that they could engage in monolingual discourse in any of them" (2000a, p. 1), indicating that age of acquisition or type of bilingual (simultaneous, early sequential, or late sequential) is not relevant to the accuracy of the codeswitching, in contrast to Belazi, Rubin, and Toribio (1994), who argue that CS research should be limited to "fluent bilinguals". (p. 222). This reflects to some extent the MLF model's lack of a theoretical grounding in existing views of bilingualism, language acquisition, and syntax, as theoretical approaches to bilingualism, CS and syntax are often closely related to assumptions about language acquisition. Instead, the MLF draws on syntactic notions from generative grammar, but does not subscribe to related issues, such as Universal Grammar (UG).

MLF basics.

The MLF model posits that in any code switch, there is a Matrix language (ML) and an Embedded language (EL). The ML syntactically dominates the CP, and Myers-Scotton and Jake (1995) define it as the language that projects the morphosyntactic frame of the utterance (p. 983). This has the effect of inevitably reducing CS to a two language dichotomy, even when Myers-Scotton herself (Finlayson, Clateaux, & Myers-Scotton, 1998) has given CS examples from South Africa that contain up to four languages. In these cases, there is always only one ML, and each EL is in a separate syntactic relationship with the ML. This directly suggests that only the ML can influence other languages (ELs)

syntactically, and that the multiple ELs have no bearing on each other or the structures they occur in. This argument is likely far too restrictive, as it suggests that CS is only dichotomous and can never involve the dynamic interaction of three or more grammars. Aside from asserting the existence of a matrix language, it remains to be shown that CS can only involve two languages, rather than three or more.

How the ML is defined is never clearly addressed, and the methods of defining it vary according to each version of the MLF. For instance, the ML is defined at one point as the language of solidarity and also the language that the speakers determine as the ML (Myers-Scotton & Jake, 2000b), both of which are essentially sociolinguistic definitions. Formally, the ML is the language which contributes the most morphemes to the discourse, according to Myers-Scotton (1993/1997, p. 68-69), but Myers-Scotton (1993, p.68) stresses that the ML cannot be determined from one isolated utterance, indicating that discourse is still a mediating factor. As Backus and Boeschoten (1996) point out though, if the ML can change at any given time, then it also becomes a factor in determining the discourse, leading to circular definitions of both the ML and discourse. However, Myers-Scotton (2000) does later say that there is only one ML in every bilingual CP and that the "matrix language is not subject to change within [the] CP" (p. 34).

MLF constituents.

In an MLF analysis, there are three possible constituents - ML islands, EL islands, and ML+EL constituents. ML islands are comprised entirely of ML

morphemes, are well-formed in the ML, and demonstrate internal structural-dependency relations typical of the ML (Myers-Scotton, 1993/1997, p. 78). EL islands are defined as being "composed of at least two lexemes/morphemes in a hierarchical relationship" (p. 138), in an otherwise ML structure. Although not directly stated, this seems to describe a monolingual (EL) maximal projection occurring within a larger ML CP, along Myers-Scotton's definition of CS, outlined above. Accordingly, ML and EL islands are maximal projections that are entirely in their respective language and are (respectively) well-formed (Myers-Scotton, Jake, & Okasha, 1996, p. 15). In contrast, an internal EL island

> may or may not be a maximal projection … [but] occurs in a mixed constituent where, from the standpoint of the ML, it is an intermediate constituent and part of a maximal projection in the ML (ibid).

This definition indicates that an internal EL island is headed by the ML, though it seems that EL islands in general would normally be headed by some constituent from the ML.

EL islands and internal EL islands differ in that internal EL islands are always embedded in mixed constituent structures (Myers-Scotton, 1993/1997, p. 151), while EL islands can stand alone as maximal projections. Internal EL islands may also be "framed" by ML particles, which can lead to situations of extensive EL islands (p. 156). Above all, internal EL islands occur within a larger ML constituent, which has characteristics such as morphemes that are attributable

to the ML. It follows that ML+EL constituents contain only one EL morpheme, as more than one EL morpheme could indicate the presence of an EL island, though Myers-Scotton (1993/1997) suggests that ML+EL constituent may contain an EL island (p. 244).

Hypotheses and principles.

There are several hypotheses and principles outlined by Myers-Scotton (1993/1997, 2002; Jake, Myers-Scotton, & Gross, 2002), which are discussed briefly below; however, content and system morphemes will be discussed separately, as they are redefined in the 4-M Model (Myers-Scotton & Jake, 2000c). Though there are more principles in the MLF, particularly those that relate to convergence and language contact issues, only those principles and hypotheses specific to CS are described below.

The Matrix Language Hypothesis.

The Matrix Language Hypothesis posits that the ML provides the grammatical frame and the EL then contributes content words. This is meant to ensure that the surface order of the CP comes from the ML, as indicated by the Morpheme Order Principle.

The Morpheme Order Principle.

The Morpheme Order Principle dictates that the morpheme order of the CP is that of the ML. In other words, the surface order of the CP will reflect the ML, and consequently the syntax of the ML, though this does not automatically

hold where EL islands are present. The Morpheme Order Principle therefore only applies universally in situations where there is one EL morpheme.

Backus and Boeschoten (1996) summarize the three strategies for obeying the Morpheme Order Principle as follows:

1. Follow the ML order
2. Use the EL order if acceptable though marked in ML
3. Use bare forms

While the first strategy is fairly clear and the second relies on discourse factors, the third strategy of using bare forms indicates that certain syntactically relevant morphemes from the EL can be left out of the code switch. However, this third strategy may also be in response to issues of (nonce) borrowing, which are most often considered code switches in the MLF. Borrowing within the MLF is beyond the scope of this chapter, but Myers-Scotton (2006a) offers an adequate overview.

System Morpheme Principle.

The System Morpheme Principle states that all late outsider system morphemes come from the ML. The construct of system morphemes is further developed by the 4M model, as discussed below. Like the Morpheme Order Principle, Backus and Boeschoten (1996) have identified the following strategies for obeying the System Morpheme Principle:

1. Use only ML late outsider system morphemes
2. Use double marking (double morphology)

3. Use bare forms

The System Morpheme Principle is able to account for somewhat troublesome switches, such as the *gecured* example (Myers-Scotton, Jake & Gross, 2002), by allowing functionally similar morphemes to occur together if one comes from the ML and the other from the EL.

Blocking Hypothesis.

Under the Blocking Hypothesis, EL content morphemes are blocked if they are not congruent with ML equivalents. In other words, an EL content morpheme cannot be used if the ML equivalent is a system morpheme, if the morphemes assign thematic roles differently, or if they differ in pragmatic function. This is later referred to as *congruence*, where there are three levels of congruence: lexical-conceptual, predicate-argument, and morphological realization patterns. (Myers-Scotton, Jake, & Okasha, 1996, p. 23)

EL Island Trigger Hypothesis.

The EL Island Trigger Hypothesis mandates that if an EL morpheme is accessed that would otherwise be blocked by the Blocking Hypothesis, then that EL morpheme will be realized as part of an *obligatory* EL island. Myers-Scotton later argues that all EL islands are obligatory (1997, p. 250), where the only way to access the EL element is in an EL island due to significant incongruence between the ML and EL.

EL Hierarchy Hypothesis.

The EL Hierarchy Hypothesis proposes that EL islands that are freely produced, i.e. not produced under the EL island trigger, are likely to be peripheral to the sentence frame and/or idiomatic in nature.

Myers-Scotton also lists an "Implicational Hierarchy of EL islands" in (1993/1997, p.144), as follows

1. Formulaic expressions and idioms (esp. as time and manner PPs, but also as VP complements)
2. Other time and manner expressions (NP/PP adjuncts used adverbially)
3. Quantifier expressions (APs and NPs, especially as VP complements)
4. Non-quantifier, non-time NPs as VP complements (NPs, APs, CPs)
5. Agent NPs
6. Thematic role- and case- assigners, i.e. main finite verbs (with full inflections)

This hierarchy outlines which constituents are most likely to occur in the EL and, therefore, occur as EL islands. These constituents are not produced by the EL Trigger hypothesis, but instead are largely formulaic or idiomatic. Whether or not they would be blocked by the Blocking Hypothesis is not discussed, though presumably they are not.

Double Morphology Hypothesis.

The Double Morphology Hypothesis allows for cases where affixes from both the ML and EL appear with a noun or verb stem and therefore may be construed as competing. In this case, the double morpheme matching the language of other system morphemes that control relationships in the constituent (e.g. affixes marking case, tense, etc.) will be the ML affix. (Myers-Scotton, 1993/1997, p. 133).

Uniform Structure Principle.

This language and CS independent principle proposes that a constituent always has a uniform abstract structure which dictates well-formedness. In the case of CS, the uniform abstract structure of the ML is preferred. This complements the Matrix Language hypothesis and offers another way of testing the ML.

Bilingual NP Hypothesis.

This hypothesis was developed to account for the frequent occurrence of single EL morphemes in an ML noun phrase (NP) in many CS corpora. Jake, Myers-Scotton and Gross (2002, p. 78) argue that frequent incongruence is predicted by the Uniform Structure Principle and EL nouns maybe included in ML NPs so long as the system morphemes come from the ML and the features relevant to the next constituent are still available. As stated, this hypothesis relates specifically to mixed NPs, but is also an example of how the MLF approach must be continually modified in order to account for current CS data.

ML Feature Hypothesis.

Finally, the ML Feature hypothesis states that the set of ϕ-features in a mixed NP must reflect those of the ML. This is a direct outcome of the Bilingual NP hypothesis, since features relevant to higher constituents must be available if EL nouns occur in ML NPs. While this hypothesis is fairly clear, it is still not evident that it is absolutely necessary. Currently, Moro (in press), Liceras et al. (2008), and McAlister (2006) have begun to address these issues within the Minimalist framework with no need to rely on a Matrix Language. Additionally, this hypothesis also shows how the MLF frequently draws from generative approaches, but does not subscribe to the underlying assumptions.

Summary.

These hypotheses and principles illustrate how the MLF adapts to different phenomena in CS, but is not able to adequately address specific issues, such as mixed NPs, without further modification. Additionally, as seen in the discussion of EL islands, internal EL islands, extensive EL islands, and ML+EL constituents, it is frequently difficult to determine exactly what code switched constituents are. This will become even more apparent in the discussion of the 4-M model below.

The 4-M Model.

The 4-M model (Myers-Scotton & Jake, 2000c) is an elaboration of the content/system morpheme distinction and offers clearer definitions than the original formulation proposed in Myers-Scotton (1993/1997). Myers-Scotton relies on psycholinguistics, particularly Levelt's production model (1989), to

differentiate between content and system morphemes and expands the model to include four types of morphemes: content, early system morphemes, and two types of late system morphemes - bridges and outsiders – as depicted in Figure 1. Content morphemes are directly elected during production and are defined as direct thematic assigners/receivers (Myers-Scotton & Jake, 2000c, p. 1058), while system morphemes do not have thematic roles.

In order to determine the type of morpheme, whether the morpheme is conceptually activated must first be identified. A morpheme is conceptually activated, according to Myers-Scotton and Jake (2000c), if the lemma supporting the morpheme is activated at the conceptual or lemma level (p.1061). The two types of morphemes that are conceptually activated are content morphemes (+assign/receive thematic role) and early system morphemes (-assign/receive thematic role). Early system morphemes are differentiated from content morphemes because they do not assign or receive thematic roles and additionally rely on content morphemes for information about their form, as content morphemes are the heads of the maximal projection of the early system morphemes (p. 1063). For instance, *chew* is a content morpheme, but *up* is automatically accessed with it, making it an early system morpheme (p. 1063).

Late system morphemes, which are accessed later in the production process, are encoded as +/- looks outside of own maximal projection feature. Of the two types of late system morphemes – bridge and outsider,

bridge morphemes are negative for this feature and rely on their own maximal projections for their form, similar to early morphemes. The classic examples are genitive *of* in English and *de* in France (ex. *beaucoup de monde*) (p. 1064). Bridges functionally connect content morphemes to each other without necessarily relating to semantic/pragmatic properties of the head.

Outsider late system morphemes look outside their maximal projection for their form, and these morphemes are usually added in the last step of formulation, i.e. agreement, tense, case. Additionally, outsider late morphemes are relevant in CS, as all outsider late morphemes must come from the ML, according to the System Morpheme Principle. Similarly, the Double Morphology Hypothesis suggests that the outsider late system morpheme from the ML is more relevant than EL morpheme in cases of double morphology.

The 4-M model, detailed in Figure 1 on the next page, operates on the principle that content morphemes are accessed first (typically nouns, verbs, adverbs and, adjectives), and early system morphemes are generally encoded with the content morpheme. From that point, the grammar assigns bridge late system morphemes when the projection is formed, and outsider late system morphemes, such as agreement, are added in the last step. While this approach may have

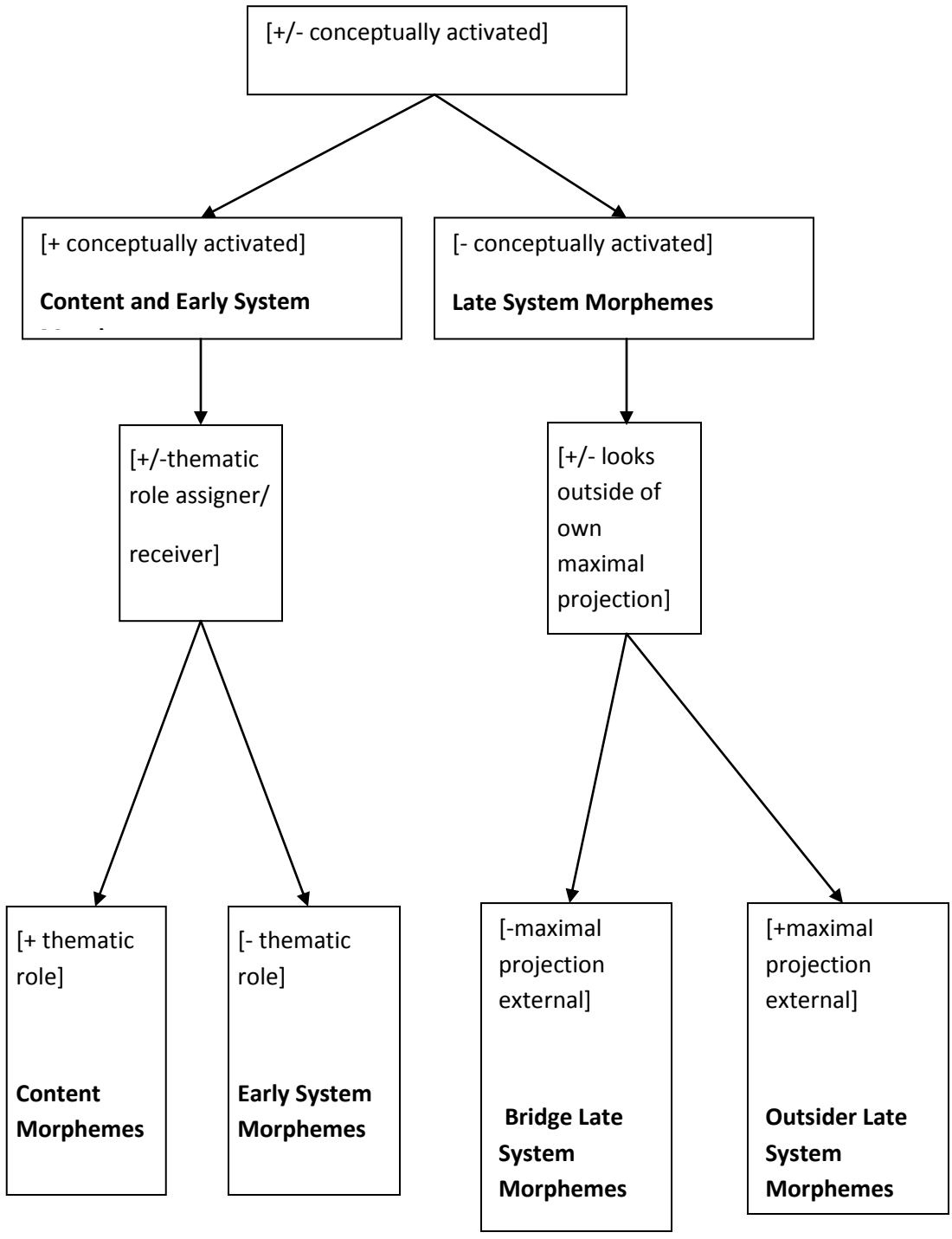

Figure 1 Morphemes in the 4-M Model (Myers-Scotton & Jake, 2000c, p. 1064)

intuitive appeal, the model is not clearly developed enough to determine which morphemes belong to what class, both cross-linguistically and within a language.

Criticisms of the MLF model.

There have been three notable critiques of the MLF framework since Myers-Scotton (1993). Backus and Boeschoten (1996) and Muysken de Rooij (1995) both offer theory-internal critiques of the MLF, many of which are still relevant despite the reformulations by Myers-Scotton (1997, 2000, 2006b). MacSwan (2005), in contrast, disputes the necessity of a Matrix Language and argues that CS data can be analyzed using existing theories of grammar, namely the Minimalist Program, as discussed below.

Both Backus and Boeschoten (1996) and Muysken and de Rooij (1995) assume that CS is either insertion or alternation, based on Muysken (1995, 2000). Backus and Boeschoten argue that the MLF framework is better suited to insertion type CS, but not alternation. Additionally, Backus and Boeschoten point out the difficulty in identifying the ML and the definition/dichotomy of system vs. content morphemes, which Myers-Scotton later revises with her 4-M Model (Myers-Scotton & Jake, 2000c). Muysken and de Rooij (1995) also share this criticism.

Lastly, Backus and Boeschoten argue that the Blocking Hypothesis is troublesome because it relies on congruence. Although they find the concept of a congruence-based constraint, as opposed to a syntactic-based constraint, appealing, Backus and Boeschoten outline several potential problems (p. 142).

Most importantly syntactically, system and content morphemes clearly vary across languages, but the distinction can also be problematic monolingually. For example, it is not clear if *for* in the EL island *check for you* is accessed because *for you* is a collocation (i.e. *for* triggers *you*) or because *check for X* is a collocation (and *check* triggers *for*).

Muysken and de Rooij (1995) have three general criticisms of the MLF. First, they point out, as does MacSwan (1999, 2005), that it is difficult to determine the ML, given the definition provided in Myers-Scotton (1993). Myers-Scotton has since revised the definition of the ML; however, it is still problematic. Secondly, Muysken and de Rooij also criticize the content/system morpheme distinction, which has been revised through the 4-M Model, though that model still contains some of the same difficulties as the content/system morpheme distinction. Lastly, Muysken and de Rooij argue that the use of embedding in a model of speech production is problematic for general theoretical reasons. Despite these criticisms, they suggest that the MLF is still an appropriate framework for CS analysis, as do Backus and Boeschoten (1996).

Finally, MacSwan (2005) offers the strongest critique of the MLF in response to Jake, Myers-Scotton, and Gross (2002), itself a critique of MacSwan (1999, 2000). By reanalyzing Myers-Scotton's own data from a Minimalist perspective, MacSwan demonstrates that the distinction between matrix and embedded languages is not needed. Additionally, MacSwan demonstrates that the MLF is not a theory of competence and does not follow from Levelt's (1989)

Speaking model. For these and a number of other reasons, MacSwan proposes that the MLF model introduces numerous, theoretically unnecessary constructs for which there are already adequate and theoretically sound alternatives (p. 20). Given this, MacSwan suggests, the MLF model should be rejected as a viable model of analysis for CS.

MacSwan (2005) offers a well-founded criticism of the MLF model, as much CS research has been conducted within a generative framework. The sections below address early, constraint-oriented generative approaches to CS, and finally the constraint-free, Minimalist approach to CS.

Constraint-Oriented Generative Approaches in Codeswitching

Following MacSwan (in press), this section will assume a historical focus on CS research carried out within the generative framework introduced with Chomsky (1957). Work syntactic constraints in CS started in the Aspects model (Chomsky, 1965) and continued through the development of Government-binding theory (Chomsky, 1981) to present day work, conducted within the Minimalist Program (Chomsky, 1995). Because of the historical nature of the field, discussion of the various approaches will be situated in an overview of the theoretically relevant generative program. This section will focus exclusively on approaches grounded in the Aspects model and Government-binding (GB) theory, as these approaches are concerned with the development of theoretical constraints (MacSwan, in press). Work within the Minimalist Program (MP), which assumes a constraint-free approach, will be discussed in penultimate section.

Codeswitching in the Aspects Model.

The Aspects Model (Chomsky, 1965) further developed ideas from Chomsky (1957) regarding the nature of transformational-generative grammar. In this model, grammar consists of a set of base phrase structure rules, which represent deep structure. Transformational rules then perform operations on the phrase structure in order to generate the surface structure. Lexical insertion, importantly, occurs after the application of phrase structure rules.

One of the ongoing factors in the development of the Aspects model is the problem of powerful grammars. A grammar should be able to generate all acceptable strings in a language while avoiding illicit, ungrammatical strings. In order to avoid overgeneration, constraints, which aimed to limit the application of a rule, were introduced by a number of researchers (Chomsky, 1965, among others). Although constraints would later be developed at the deep structure, initially they were understood as something that applied largely at the surface structure.

The work on CS during this time also reflected the notion of constraints applied at the surface level. For instance, Timm (1975) reported a series of general surface level bans in Spanish-English CS, such as a ban on switching between pronominal and finite verbs (p. 477). No theoretical explanations were offered for any of the constraints, though this article aimed to demonstrate the rule-based nature of CS rather than elaborate on the rules involved.

Pfaff (1979) proposed a number of constraints on Spanish-English CS, noting that a third grammar is unnecessary, as "the grammars of Spanish and English are meshed according to a number of constraints" (p. 314). These constraints may be functional, structural, semantic, or discourse-driven; however, these constraints were again largely descriptive and lack theoretical explanations.

It is worth noting that early descriptive work such as Timm (1975) and Pfaff (1979) demonstrated that CS is rule-governed and a product of bilingual proficiency rather than deficiency. Both Timm and Pfaff stressed the bilingual competency of their informants and argued that CS is as much a product of discourse factors as it is syntactic factors. These descriptive studies laid the ground work for later, more developed theories of CS, as they repeatedly demonstrated that intrasentential CS is indeed rule-governed and predictable, which is a necessary characteristic for further theoretical development.

The Equivalence and Free Morpheme Constraints.

Poplack (1979/80) and Sankoff and Poplack (1981) are generally assumed to be the first to posit constraints driven by syntactic theory, which go beyond description to formulate constructs that are part of linguistic competence. While the Equivalence and Free Morpheme constraints are possibly the most critiqued constraints in CS, it is important to note that their formulation marks a change in the research platform of the time and firmly root CS research in generative theory.

The Equivalence Constraint.

The Equivalence Constraint, stated in (3), formulized a characteristic of CS that several researchers had previously noticed, including Lipski (1977).

(3) The Equivalence Constraint

> Code-switches will tend to occur at points in the discourse where juxtaposition of L_1 and L_2 elements does not violate a syntactic rule of either language, i.e. at points around which the surface structures of the two languages map onto each other.
>
> (Poplack, 1979/80, p. 586)

Though later formulations of the Equivalence Constraint differ slightly in their wording, they still convey the idea that there must be surface correspondence between the two languages at the switch point. However, this is different from the Minimalist notion that CS is the union of the two grammars (MacSwan, 1999), as the Equivalence Constraint focuses only on surface structure, which is a product of the grammars rather than a union of them.

The Free Morpheme Constraint.

Poplack (1979/80) and Sankoff and Poplack (1981) also proposed the Free Morpheme Constraint, stated in (4).

(4) The Free Morpheme Constraint

> A switch may not occur between a bound morpheme and a lexical form unless the latter has been phonologically integrated into the language of the bound morpheme.
>
> (Sankoff & Poplack, 1981, p. 5)

This constraint bars codeswitching within a word, such as (5).

(5) *eat-*iendo*

eat-ing

(Poplack, 1979/80, p. 586)

However, this does not exclude forms where the morpheme has been phonologically integrated into the other language, described by Meechan and Poplack (1995) and others as (nonce) borrowing.

Criticisms of the Equivalence and Free Morpheme Constraints.

As previously mentioned, both the Equivalence Constraint and the Free Morpheme Constraint have been scrutinized by many researchers over the course of the past thirty years. The Free Morpheme Constraint has been supported by examples from Clyne (1987) and MacSwan (1999, 2005), among others; however, Myers-Scotton (1993/1997) and Jake, Myers-Scotton, and Gross (2002) have provided counterexamples.

The Equivalence Constraint has not had the same acceptance as the Free Morpheme Constraint and has been rightly criticized, as counterexamples exist in many corpora (Mahootian, 1993; Myers-Scotton, 1993; Belazi, Rubin, & Toribio,

1994; MacSwan, 1999; and Muysken, 2000, for example). Despite this, the formulation of the Equivalence Constraint is problematic as it relies on a code-switching specific constraint. Pfaff (1979) described these types of mechanisms as a third grammar, and Woolford (1983), Mahootian (1993), MacSwan (2000) and Cantone (2005), among others, have argued against the existence of a third grammar for theoretical reasons.

As the Equivalence and Free Morpheme Constraints were being debated, Chomsky further refined Chomsky (1965) with the introduction of Government-Binding (GB) Theory (Chomsky, 1981). This theory would come to dominate much of the work in CS conducted over the following two decades, with the important distinction that CS researchers now had the clear goal of developing theoretical approaches in CS that reflected what was occurring in generative syntax.

Codeswitching research in GB Theory.

GB theory (Chomsky, 1981), which is also referred to as Principles and Parameters, offered several refinements of the Aspects Model through the introduction of Move α, X' Bar Theory, θ Theory and others. As language specific mechanisms such as transformational rules and phrase structure rules were replaced by Move α and X' Bar Theory respectively, researchers began to focus on abstract, universal language constructs rather than rules for specific languages. This benefited CS research in allowing proposals to be based on underlying universal principles rather than on surface structure.

Woolford (1983) was one of the first researchers to apply new developments in GB to CS. She argued that, in cases of CS, phrase structures are drawn from both grammars and it is impossible to discern which grammar they come from when they overlap (p. 522). By assuming two monolingual grammars overlap to some degree in the phrase structure component, Woolford was able to achieve the same theoretical outcome as the Equivalence Constraint (Poplack, 1980), but without relying on a CS specific constraint. As MacSwan (2004, p. 287-288) pointed out, this was theoretically sophisticated, but unfortunately was subject to many of the same counterexamples as Poplack's Equivalence Constraint.

The Government Constraint.

Di Sciullo, Muysken, and Singh (1986) introduced the Government Constraint, given in (6).

(6) Government Constraint

a. If L_q carrier has index q, then Y_q^{max}.

b. In a maximal projection Y^{max}, the L_q carrier is the lexical element which asymmetrically c-commands the other lexical elements or terminal phrase nodes dominated by Y^{max}.

Di Sciullo, Muysken, and Singh (1986, p. 6)

Di Sciullo, Muysken, and Singh (1986, p. 6) defined government as (7),

(7) X governs Y if the first node dominating X also dominates Y, where X is a major category N, V, A, P and no maximal boundary intervenes between X and Y.

with the additional lexical insertion condition given in (8).

(8) if X governs Y, $\ldots X_q \ldots Y_q \ldots$

Di Sciullo, Muysken, and Singh (1986, p. 5)

The lexical insertion condition introduced a language index, which is also present in monolingual contexts, though not salient. This constraint suggests that government effectively bans CS. Clyne (1987) also interpreted the Government Constraint to mean that switching can only occur between elements not related to government and offered counterexamples. As a theoretical critique, MacSwan (in press) points out that Di Sciullo, Muysken, and Singh's language index in fact introduces a CS specific constraint, as it is not necessary in a monolingual system, even if it is present.

The Functional Head Constraint.

Belazi, Rubin, and Toribio (1994) proposed the Functional Head Constraint (FHC), stated as (9)

(9) The Functional Head Constraint

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

Belazi, Rubin, and Toribio (1994, p. 228)

Belazi, Rubin, and Toribio argued, similar to Di Sciullo, Muysken, and Singh (1986), that the Functional Head Constraint is present in monolingual contexts as well, though its effects are only apparent in bilingual data. Empirical considerations aside, the same critique leveled at Di Sciullo, Muysken, and Singh also applies to the FHC, as the FHC requires a language feature that may be present, but is not salient, in monolingual data. As with the language index, the language feature is essentially a code-switching specific, third grammar, although MacSwan (1999) pointed out that this has more interesting implications if the language feature is viewed as a collection of formal features in a language rather than an actual +/- feature. If languages are viewed as sets of formal features, then those sets can be compared, though this requires further conceptualization of how conflicting features might relate to each other.

Null Theory of codeswitching.

At the same time that Belazi, Rubin, and Toribio (1994) proposed the FHC, Mahootian (1993) also developed her null theory of codeswitching. Although Mahootian appeared first, she evaluated the FHC, though the reference is unlisted, and sparked an interesting debate, which will be discussed after Mahootian's (1993) proposal.

Mahootian (1993) proposed a null theory of codeswitching, where only principles of GB theory are required for accounting for CS data and there is no reliance on a third grammar mechanism. As Mahootian states, her model assumes

"nothing more than what we grant the speaker of any language: the knowledge which speakers use to discern and produce grammatical monolingual utterances" (p iii). Woolford (1983), Pfaff (1979), and others have also asserted this, and MacSwan (1999) would later reiterate the same idea; however, Mahootian's implementation of a null theory is only limitedly successful.

Mahootian formalized her work with a Tree-Adjoining Grammar (TAG) (Joshi, 1985), which is a natural language processing formalism. Though a TAG is grounded in generative theory, MacSwan (2004) noted that the Null Theory approach would need to be elaborated in order to work in mainstream approaches (p. 289). However, TAG encodes structures in the lexicon, which Mahootian finds advantageous, and is a precursor for Minimalist approaches to CS.

The question of data type.

Though Mahootian and Santorini (1996) offered several critiques of the FHC (Belazi, Rubin, & Toribio, 1994), their critique of research methods is perhaps the most interesting. Mahootian and Santorini objected to the use of grammaticality judgments, as data is elicited rather than naturalistic. They echoed Bentahila and Davies' (1983) concerns that a negative grammaticality judgment does not necessarily indicate the presence of syntactic constraints. Mahootian and Santorini (1996) are not the only researchers to prefer naturalistic date over elicited data (see Myers-Scotton, 2006b), but many CS researchers rely on grammaticality judgments for negative evidence not present in naturalistic corpora. However, it is worth noting that Schütze (1996) also appeared at this

time, which critiqued contemporary use of grammaticality judgments and offered several principles for improving the methodology of elicited data research. Though both types of CS data are clearly useful, this discussion marks the start of questioning the validity of certain types of data, which will eventually extend to questioning data from different types of bilinguals.

Concluding Remarks.

Though CS theory had advanced since the introduction of GB theory, with a move away from surface level constraints and concerted attempts to avoid a third grammar, none of the proposals could adequately account for the range of data available. As possibilities in GB theory were gradually exhausted, Chomsky (1995) introduced the Minimalist Program (MP), which would vastly improve the theoretical tools and goals CS researchers had at their disposal.

A Minimalist Approach to Codeswitching

The Minimalist Program (MP) was proposed by Chomsky (1995) as a refinement of earlier generative theories. According to Radford (1997, p. 6), Chomsky was attempting to "minimize the theoretical and descriptive apparatus used to describe language". Particularly, Chomsky argued that work within the MP should address conditions of economy, virtual conceptual necessity, and unity and symmetry.

Language is understood as an optimal system which is subject to conditions determined by the demands of interfaces, such as S-M and C-I, discussed below. The pressing question within the MP is why the language

system is as it is, in contrast to previous research platforms that sought to describe language at the surface level and explain the processes necessary to derive the surface structure. Boeckx (2006) expresses this as the question 'to what degree is language "perfect"?' (p. 116). Ultimately, work within the MP should address this question above all by demonstrating how language is optimal in the scientific sense, i.e. language as a system is minimal, non-redundant, and adequate.

Within the MP, several features of GB theory were shown to be extraneous. For instance, all movement operations were now attributed to Merge, which operates on only two elements at a time and is used to create hierarchical structures. External Merge occurs when two elements from the Lexical Array are merged, while Internal Merge refers to the recombination of elements already merged under External Merge (Move in Chomsky (1993)).

The Lexicon.

As a further refinement, phrase structure rules and parametric variation are encoded in the lexical entries of each lexeme as morphological features. One effect of the lexicalization of parameters is that the lexicon becomes the source of cross-linguistic differences, as Move is the same across all languages. $C_{HL,}$ the computational system for human language, is also fixed across all languages, and phrase structure is derived from the characteristics encoded in the lexicon, not from language specific rules external to the lexicon as previously.

Formal, semantic, and phonetic features are encoded in the lexicon. Formal features such as case, category, and ϕ-features (person, number, and

gender) drive the derivation process instead of phrase structure rules. Semantic features are also encoded in the lexical entry and form the input to the Conceptual-Intentional (C-I) interface (previously LF). Phonological features convey the information necessary to the Sensori-Motor (S-M) interface (previously PF), which interprets features for physical production, i.e. pronunciation.

Derivation.

Derivation starts with Select entering lexical entries into Lexical Array and a syntactic structure is built using External and Internal Merge. Lexical items enter Lexical Array with valued and unvalued grammatical features, which must be valued during syntax. Additionally, features are interpretable or uninterpretable, where interpretable features are relevant to C-I and determine meaning, while uninterpretable features help drive derivation through valuation. In order to avoid the derivation crashing, all features must be valued, since the S-M interface cannot accept unvalued features, and uninterpretable features must be deleted as they are irrelevant at the C-I interface. Once the derivation is complete, Spell-Out then strips away the phonological information, which is sent to S-M, leaving only the semantic and interpretable features, which are sent to C-I.

Though Chomsky (1995) only accounts for monolingual language production, bilingual production and the architecture of bilingualism are readily accounted for by the same mechanisms (MacSwan, 2000). Since the lexicon encodes language variation, bilingualism and multilingualism result from having

more than one lexicon. Given that Select and Merge do not vary, but rather the parameters and items stored in the lexicon, the MP allows for a much simpler conceptualization of bilingualism than the previous notion of two separate and compartmentalized grammars (MacSwan 1999, p. 71). During CS, items are selected from both lexicons, which provide differing parameters, while the C_{HL} remains the same.

Codeswitching within Minimalism.

The Minimalist approach is also robust enough to account for CS. Boeckx (2006) states that "the aim of the Minimalist program is to determine under which conditions narrow systems meet interface demands in an optimal fashion" (p 155). Any account of CS must also follow this aim, though the unique conditions of CS include the contribution of sometimes competing features from multiple lexicons. The lexicalization of parameters and the adherence to minimal theoretical assumptions provided new perspectives in the quest to adequately account for CS. MacSwan (1999) proposed an outline of CS within the MP, and several researchers have since followed suit (for instance, Cantone, 2005; Cantone & McAlister, forthcoming; Radford et al., 2007; Moro, in press).

The uniformity of derivation across all languages and the encoding of linguistic variation in the lexicon offer a strong argument against the existence of a third grammar for CS. MacSwan (1999, p. 146) proposes

> Nothing constrains codeswitching apart from the requirements of the mixed grammars.

The only constraints needed in CS then are those that are stored in each lexicon as parametric variation and features. In bilingual utterances, items are taken from more than one lexicon by Select and undergo checking in the same way as monolingual derivations (MacSwan, 1999). No third grammar or special CS mechanism is necessary, which adheres to minimum theoretical assumptions, and follows, for example, Woolford (1983) and Mahootian (1993).

MacSwan (1999) also offers the PF Disjunction Theorem to account for the apparent ban on word-internal CS, which follows from Poplack's Free Morpheme Constraint. Revisions of the PF Disjunction Theorem led to the proposal of the PF Interface Condition (MacSwan, 2009; MacSwan & Colina, in press), which provides a syntactic definition of the lower boundary of CS and demonstrates why word-internal CS is not possible. The PF Interface Condition (Macswan, 2009, p. 331) states

(i) Phonological input is mapped to the output in one step with no intermediate representations.

(ii) Each set of internally ranked constraints is a constraint dominance hierarchy, and a language-particular phonology is a set of constraint dominance hierarchies.

(iii) Bilinguals have a separately encapsulated phonological system for each language in their repertoire in order to avoid ranking paradoxes, which result from the availability

of distinct constraint dominance hierarchies with conflicting priorities.

(iv) Every syntactic head must be phonologically parsed at Spell Out. Therefore, boundary between heads (words) represents the minimal opportunity for CS.

As the PF Interface Constraint clearly states, the phonological system of a language is comprised of ranked constraints, such that a bilingual will have two separate phonological systems, along with the respective constraint rankings. If this is the case, then word internal code switches are automatically disallowed, given that a union of the two phonological systems would result in conflicting constraint rankings.

Agree.

Chomsky (2004, 2007) introduced new mechanisms which CS researchers have recently begun to incorporate into their analyses. Among these are probe and goal, an emphasis on features, and phases. Agree, which is the relationship between probe and goal, ensures that uninterpretable features on the probes are valued and deleted in order for the structure to converge. Additionally, derivation is divided into phases- CP and vP in Chomsky (2004) and CP, v*P, and n*P (DP) in Chomsky (2007), which serve to detect ill-formed structures early, thus increasing efficiency and relieving memory load.

The Agree relation between probe and goal relies on c-command and is driven by feature checking. A probe, which c-commands the goal, carries

uninterpretable features that can be valued by the goal. Reflexively, the goal also has uninterpretable features that are valued by the probe. A typical example of probe-goal is shown in Figure 2 on the next page.

T has its uninterpretable ϕ-features valued by the interpretable ϕ-features on the N, while the N receives case from T because T is tensed and matches N in ϕ- features. The Agree relation allows features to be valued, which allows the structure to converge, without involving movement.

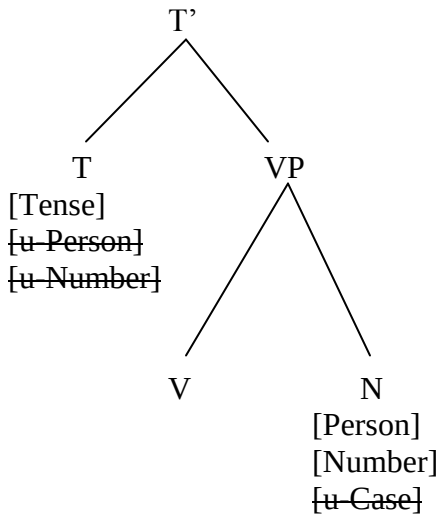

Figure 2 Illustration of Probe-Goal

Since parameters are encoded in features, features and feature checking are vital in codeswitching. Derivations can only converge when features are properly valued and when uninterpretable feature have been deleted, which involves feature matching, as shown in Figure 2. Basic word order differences are also attributable to feature strength. Strong features require that the

phonological features also move during feature checking (overt movement), while weak features allow phonological features to remain in situ (covert movement). In CS, as in monolingual derivations, the strength of the features on T determines word order (see MacSwan (in press) for further elaboration).

Phases.

Phases are also introduced in the MP as an efficiency mechanism. Essentially, a phase is a point in the derivation where material is stripped off and sent to the interfaces by Transfer before completion of the entire derivation. Multiple phases have been identified, including CP, v*P, and n*P (DP) most recently (Chomsky, 2007). The domain of the phase, defined as the c-command domain (or complementizer) of the phase head, becomes impenetrable once all operations within the phase have been completed. Once the phase is impenetrable, only the edge of the phase is available for further operations, where the edge of the phase is defined as the head of the phase and its specifier.

Phases alleviate working memory load and increase efficiency, as material that is no longer relevant to the derivation is transferred to the interfaces. Additionally, Transfer involves valuation of uninterpretable features, allowing non-convergent derivations to crash before the entire derivation takes place. Finally, as Chomsky (2004, p. 116) points out, in order for efficiency to be maximized and memory load to be minimized, phases should be small, thus allowing for more cyclicity.

Criticisms of a Minimalist approach to code-switching.

Carol Myers-Scotton and colleagues have leveled several criticisms at the Minimalist approach to code-switching (Jake, Myers-Scotton & Gross 2002; 2005). Namely, they argue that a Minimalist approach to code-switching as outlined by MacSwan (1999) does not allow for the apparent asymmetrical contributions of the languages to the syntax of the utterance. However, in trying to show the compatibility of the MLF Model with Minimalism, the addition of a number of features such as Embedded Language Islands, the Blocking Hypothesis, and the Uniform Structure Principle require codeswitching to look to constraints outside of the grammars and the language system, which does not follow the Minimalist principle of minimum theoretical assumptions and is therefore not as desirable as MacSwan's approach (1999).

Additionally, Jake, Myers-Scotton and Gross (2002, 2005) argue that using a framework based on monolingualism is fundamentally flawed, since "part of recognizing that monolingual and bilingual data are not the same thing is to acknowledge that such additions or modifications are likely to be necessary" (2005, p. 277). MacSwan (1999, 2000) has already demonstrated how bilingual data can be accounted for in the MP, and it seems that Jake, Myers-Scotton and Gross have misunderstood the nature of Minimalism. As has been stressed by others (Chomsky, 1999; Boeckx, 2006), the Minimalist Program is not a theory, but a research program which offers guiding principles for linguistic research. As such, it is not a monolingual approach and extending existing monolingual

constructs, such as derivation, to bilingual data is very much in the spirit of the MP.

Concluding Remarks

This section has provided an overview of various syntactic approaches to CS, though these are certainly not the only endeavors in CS. Many have looked at CS from sociolinguistic standpoints, such as Myer-Scotton (1993b) and some of the founding work in the field (Blom & Gumperz, 1972). Others (Poplack, 1979/1980; Budzhak-Jones, 1998) have explored intrasentential CS using a Variationist framework (Labov, 1972). Additionally, Bhatt (1997) has proposed an Optimality Theory (Prince & Smolensky, 1993) approach that ranks universal constraints on codeswitching. Muysken's typology of CS (1995, 2000, 2005) and Myers-Scotton's MLF (1993/1997) also propose models that account for many aspects of CS.

Despite these, a Minimalist approach to CS is preferred for several reasons. Above all, a Minimalist approach extends existing work in generative grammar to bilingual data, which demonstrates the robustness of the MP and allows CS researchers to draw from the wider field of (monolingual) syntax. If minimalist assumptions are correct, then CS should be constrained by the same principles that constrain monolingual structures. Further, the MP encompasses more than just syntactic work and includes frameworks for language production, language acquisition, and language evolution. The extension of the MP to CS and other bilingual issues contributes to a unified understanding of Language, which

also addresses one of the pressing questions in Minimalist work – why Language is the way it is.

For these reasons, a Minimalist approach is preferred for analyzing CS data. Above all, the Minimalist Program offers the opportunity to understand CS as both a process and a product, while also exploring language as an optimal system. Finally, as a research platform, Minimalism enables the unification of findings in the fields of second language acquisition (SLA) and the Critical Period Hypothesis (CPH) with current CS research.

The Critical Period Hypothesis

This section offers a review of the Critical Period Hypothesis (CPH), with particular attention to generative approaches and sociocultural factors affecting second language acquisition (SLA)[1]. An overview of current research on attainment and the CPH in SLA will be provided before juxtaposing the CPH with sociocultural factors involved in SLA. Major criticisms of current CPH research will be reviewed, with particular attention to theoretical and sociocultural issues. Further, the role of the CPH in the CS practices of second language learners (SLLs) and bilinguals will be explored, before a generative framework for the analysis of non-simultaneous bilingual CS will be suggested.

[1] For the purpose of simplicity, I will refer to second language acquisition as SLA, though many of the researchers cited use the designation of L2A for theoretical reasons. Additionally, albeit somewhat unfairly, I refer to any language learned after the first language as a *second language* and also assume *bilingualism* to subsume multilingualism.

Review of CPH Research

Research on the CPH in SLA is exceptionally varied, explores divergent phenomena and routinely reaches different conclusions. Linguists have historically accepted the existence of a critical period in both first and second language acquisition, based on cases such as Genie and Chelsea. According to Singleton and Ryan (2004, p. 4), Lenneberg's (1967) work was the first on the CPH and, tellingly, sought explanations for the CPH rather than a demonstration of the existence of the CPH in SLA. Most ensuing CPH studies have followed suit and assumed any deviations from the monolingual norm to be evidence of a critical period for second language learners.

Defining the Critical Period.

Lightbown and Spada (2006, p. 68) offer a basic definition of the critical period in FLA, simply stating that the critical period is a "time in human development when the brain is predisposed for success in language learning". It follows that a critical period in SLA also exists, and language learning that takes place after this optimal time relies on general learning strategies rather than language specific strategies, such as UG (ibid.). This definition situates the critical period in FLA and SLA as a cognitive phenomenon that is part of the natural development of the human brain, where language learning is most likely to become successful before a given maturation point. While this definition is fairly common, issues such as input, near universal success (in first language acquisition) and innateness remain unaccounted for, as well as variable attainment

in SLA. Nevertheless, it is a good starting point, because the critical period is positioned as cognitive and specific to language learning. It is important to note that this definition is a loose interpretation of *critical period*, as a strict understanding of critical period maintains that a behavior can only be acquired up until a certain, specified point and then not at all afterwards (Singleton & Ryan 2004, p. 32), which may account for FLA but cannot account for second language learning, particularly in adults.

Critical Period Hypothesis research.

Given the vast number of studies conducted on the CPH, it is difficult to summarize the current state of the field, although Singleton and Ryan (2004) provide an extensive account of the research findings. CPH studies explore issues as varied as phonology, plastiticity and lateralization, syntax, and UG parameters, among others, while other studies not specifically focused on the critical period may address these issues as well as sociolinguistic and sociocultural factors. This section touches on the general conclusions reached by various researchers in SLA, specific to the CPH, while also exploring other aspects of SLA which affect proficiency/attainment.

Singleton and Ryan (2004) divide their overview of CPH studies into three approaches: Younger = Better, Older = Better, and Younger = Better in Some Respects. Advocates of the Younger = Better position argue that SLA should start as close to FLA as possible, as children are more efficient and better learners, while the Older = Better stance suggests that older learners have more developed

learning skills than younger learners, thus facilitating SLA. Finally, the Younger = Better in Some Respects approach attempts to pull from both previous approaches. These studies suggest that younger learners are only better in some aspects, namely phonology and ultimate (syntactic) attainment, and older learners exceed younger learners in initial key areas such as syntax and morphology (p. 94). They note that there is not enough consistent evidence to support any of the above approaches (p. 115), but rather that "the various age-related phenomena isolated by language acquisition research probably result from the interaction of a multiplicity of causes and that different phenomena may have different combinations of causes" (p. 227). What is most striking from the vast number of studies included in their overview is not the sheer amount of research conducted on the CPH, but rather the lack of consensus on what the critical period, should it exist in any of its various forms, actually affects and how.

Successful Second Language Acquisition.

Much research on the CPH explores why adult learners have not attained native-like levels in their L2. However, a growing collection of studies has looked at adult learners who have achieved native-like levels. The reasoning behind theses studies addresses one area of concern in CPH research, namely why the ultimate attainment of some adults, despite the assumed existence of a critical period, approaches that of a first language learner. Some of these studies have focused on phonological aspects of SLA, where adult learners are judged to have a native speaker accent by native speakers (Bongaerts, Mennen, & Van der Slik,

2000). Others, such as Birdsong (1992) and White and Genesee (1996) have used grammaticality judgments to compare the syntactic attainment of highly proficient SLLs with monolingual native speakers. What these studies have found is that some SLLs do fall within the range of native speaker variation, indicating that a critical period is not a mediating factor in at least some aspects of these speakers' language acquisition.

Non-linguistic factors affecting Second Language Acquisition.

Additionally, many researchers have attributed differences in SLA outcomes to various non-linguistic factors. Krashen (1985) attributes some variability to an affective filter, while Weber-Fox and Neville (1999) suggest that specialized neural subsystems are subject to maturational constraints that adversely affect SLA. Singleton and Ryan (2004) also point out that hearing can deteriorate with age, which would certainly hinder SLA, as would the accompanying deterioration of working memory, particularly phonological working memory (p. 214). In addition, Jia and Aaronson (1999) argue that adult SLLs may make social choices that limit their contact with L2 speakers, particularly if they are surrounded by speakers of their L1.

Bialystok and Hakuta (1994), in reviewing contemporary research on SLA, note that "there are no absolute barriers to second language acquisition" (p. 207). They suggest that SLA should be understood as a complex process that is affected by a variety of variables beyond some innate limitation. In support of this, Bialystok and Hakuta point out that SLA studies are traditionally based on an

assessment of some kind, but that those assessments are narrowly focused and do not account for the range of phenomena that constitute proficiency. Furthermore, SLLs are unlikely to score consistently high on all assessments, should they be administered, as language learning is ultimately context dependent and each context requires a different set of language skills (p. 207). Lastly, they note that "there is perhaps an optimal or most felicitous match between an individual learner and the circumstances of language learning, and it is this correspondence that promotes success" (p. 208-209). This indicates that ultimate achievement is not based on the presence of a critical period, but that second language learning is a process affected by any number of individual and social variables that contribute to the overall outcome, though the outcome itself is never absolute.

Finally, although variability exists in SLA, current research has failed to adequately address why this occurs. According to Mitchell and Myles (2004), there are generally assumed to be two types of variability: internal and external. Internal ability refers to how a single learner may use different forms to represent the target form within the same time frame, i.e. variation in interlanguage, and has been attributed to markedness, language change, universal developmental constraints (such as the CPH) and L1 transfer (Mitchell & Myles, 2004, p. 225 – 227). External variability, on the other hand, refers to sociolinguistic factors such as style and gender (p. 227 – 228). If the critical period does exist, then it is not clear what kinds of variation exactly can be attributed to the critical period, although most studies do traditionally address syntax and phonology. In fact,

Hyltenstam and Abrahamsson (2003, p. 570) argue that the wider range of variability among older SLLs may indicate that non-linguistic factors, such as those discussed in the preceding paragraph and the section below, may play a more important role than a critical period. However, this perspective in SLA still focuses on the individual in relation to an abstract understanding of the language being learned, whereas sociocultural approaches situate the individual in terms of actual language use by a community of speakers.

Sociocultural Factors in Second Language Acquistion

In his review of research on sociocultural approaches in SLA, Block (2003) focuses on two general areas in sociolinguistics: identity and communities of practice. Zentella's (1997) extensive work on *el bloque* also echoes similar themes, though her work is situated in the context of a study, while Block (2003) offers an overview of the field.

Identity.

Issues of identity are frequently discussed in both sociolinguistic and sociocultural studies of language, and Block suggests that identity plays a key role in conversation and, therefore, in SLA.

> …when individuals engage in conversational exchanges… there is more at stake than simply the successful transference of information from one mind to another. …while there is surely negotiation for meaning at one level, there is also negotiation of

> identity in a general sense and specifically the negotiation of solidarity, support and face. (Block, 2003, p. 81)

Mitchell and Myles (2004) also describe how identity has been a focus point of two particular studies, Norton (2000) and Bremer et al. (1996). Both studies show how identity is strongly tied to language ability, as participants in the studies were able to use their second languages to assert and transform their identities. In particular, some participants in the Bremer et al. (1996) study asserted a native-like identity through second language manipulation and these participants achieved native-like levels in their second language (Mitchell & Myles, 2004, p. 248). Finally, Zentella (1997, p. 113) observed that children in *el bloque* used codeswitching to demonstrate both language ability and community membership. Learning a second language offers an opportunity to acquire a new identity as well as a different medium for asserting existing identities, and second language ability is certainly affected by the SLL's need to manipulate multiple identities. For further discussions of identity and language, particularly in the context of schooling, see Gee (1996, 2004).

Communities of practice.

The use of language to assert identity and membership reflects Lave and Wenger's notion of community of practice (1991). Though Lave and Wenger focus on community of practice as a monolingual phenomenon, Block considers SLA to be an act of "becoming a member of a community of practice" (2003, p. 105). By definition, a community of practice consists of peripheral and core

members, where the core members have access to the resources of the community (Mitchell and Myles, 2004, p. 241). In the case of SLA, core members are usually "native" speakers, and peripheral members are learning the language of the core members as a second language. For example, Zentella (1997) states that "community members shared a sense of how to go about being a member of *el bloque*" (p. 55), which included CS along with a number of varieties of English and Spanish. New comers to *el bloque*, particularly monolinguals, learned how to manipulate these language practices in order to demonstrate membership in the community.

Toohey (2000) has similarly illustrated how identity and membership affect second language learners in early elementary grades. In her study, those students whose identities were most valued by other members of the classroom community also succeeded in learning English as a second language. Students who were marginalized because of their identities and/or proficiency in English had less access to classroom discourse and did not become as proficient as more accepted students. Though Toohey's study is situated in early elementary grades, it is reasonable to assume that issues of identity and membership can affect older SLLs in similar ways. If this is the case, then failure to achieve native-like attainment may in part be a result of social issues rather than age-related neurological, linguistic, or cognitive limitations.

Age as a social construct.

Finally, Block (2003) also suggests that new conceptualizations about age may change how second language acquisition is approached. He points out that some researchers, such as Coupland (2001), understand age as a social construct rather than a biological reality, similar to gender. Coupland argues that adult language, as a generational variety, is seen largely as static and not subject to development, whereby an increase in chronological age directly represents an increase in distance from the current sociocultural linguistic norm (2001, p. 190-191). Speakers whose approximation of the current norm is significantly closer than their chronological age predicts are seen as unnecessarily crossing certain social barriers. How this affects SLA specifically remains to be explored, but it is clear that age, as a social construct, could affect second language and CS practices, particularly in terms of access to forms of age-marked language practices.

Codeswitching in Second Language Acquisition

Research on CS in SLA is sparse, and some researchers argue that SLLs do not and cannot engage in CS, given that they are not simultaneous bilinguals. On the other hand, sociocultural and sociolinguistic studies outline motivations for CS, which presumably affect SLLs as well. Finally, research on intrasentential CS has demonstrated that SLLs may prefer certain CS forms over others, while many contend that this is not true CS.

Codeswitching and language acquisition.

Toribio and Rubin (1996) and Bhatia and Ritchie (1996, 1998) argue that CS during SLA demonstrates the progress of language acquisition, particularly as SLLs become more sensitive to certain structures and adapt their CS accordingly. Zentella (1997) and Poplack (1980) also indicate that intrasentential CS changes with developing proficiency.

Zentella's (1997) study of *el bloque* is unique in that she was able to capture how CS is used by members of the community, regardless of degree of proficiency. She notes that preferences in CS patterns change with increased proficiency in the girls she studied and that specific CS patterns were associated with particular proficiency groups (p. 113). Additionally, she also noted how CS patterns changed based on the increased proficiency of other interlocutors (p. 86), which is an interesting effect in naturalistic data.

Poplack (1980) found that proficient Spanish-English bilinguals preferred intrasentential codeswitches, while the dominant bilinguals in her study switched into their weaker language using tag questions and rarely used intrasentential switches. Poplack hypothesizes that this preference in CS requires the most knowledge about both languages and is therefore only available to proficient, i.e. balanced, bilinguals. Further, Poplack also found a similar pattern based on age of onset and age of migration, which were generally the same among her participants. Those bilinguals who learned English in early childhood had the highest rate of intrasentential code switches, followed by those who began

learning English between the ages of 8 and 13. Finally, there was a significant drop in the occurrence of intrasentential CS for those who started learning English as either adolescents or adults (p. 249). Despite this pattern, Poplack notes that there were almost no ungrammatical code switches in her corpus, and even non-fluent bilinguals, presumably dominant bilinguals and those who learned English as adolescents or adults, were able to codeswitch grammatically by adapting their CS patterns (p. 253).

Motivations for Codeswitching.

Zentella's extensive (1997) study of *el bloque* details how CS is a product of a community of speakers, such that members and new comers regularly codeswitch into their weaker language to demonstrate community membership. This illustrates one reason why adult second language learners would chose to codeswitch, even if they have not reached native-like abilities in their second language. For instance, Zentella describes how children codeswitched more with their parents as their parents learned more English, thus socializing parents into the practice of CS (1997, p. 86). To underscore this point further, Ritchie and Bhatia (2004, p 339) list four related socio-psychological factors that determine CS:

1. the social roles and relationships (i.e. identities) of the participants;
2. situational factors such as discourse topic and language allocation;

3. message-intrinsic considerations; and
4. language attitudes, which includes social dominance and security (solidarity, support, and face according to Block (2003)).

These factors are also reflected in discussions of socio-cultural aspects of SLA, but, more importantly, indicate discourse-level factors involved in CS that do not reflect proficiency, but do affect second language learners, especially if CS is considered a part of SLA from a sociocultural perspective. Ultimately, if CS is a way to assert identity and community membership, then SLLs will learn to codeswitch as they acquire their second language, much like members of Zentella's *el bloque*.

Codeswitching and Critical Period Hypothesis Research.

Very little research has been done on CS, particularly intrasentential CS, in relation to the CPH. Some researchers, such as Zentella (1991) and Poplack (1980) discussed above, have indicated that SLLs prefer certain CS forms over other and that these preferences may change with increased proficiency. Others, such as Toribio and Rubin (1996) and Bhatia and Ritchie (1996, 1998), argue that CS in SLL can be used to understand the SLA process.

While many researchers prefer certain types of bilinguals (MacSwan, 1999, 2005), and Toribio and Rubin (1994) argue that language dominance should be considered in CS studies, few CS researchers currently feel compelled to disclose the bilingual history of their participants. This is unfortunate, as the

existence of a critical period should predict effects in CS patterns, and differences in CS patterns based on age of onset may provide interesting insights for CPH researchers. However, many researchers from differing theoretical frameworks (such as Fuller & Lehnert, 2000) rely on data from late sequential bilinguals, who are referred to as SLLs by researchers who discount this CS.

This debate, based on CPH research, ultimately asks who can provide the most reliable and accurate CS data, reflecting the relevant underlying languages structures that constrain grammatical CS. For instance, the Johnson and Newport (1989) study has been frequently cited as evidence that the critical period exists and that late sequential bilinguals should be excluded from CS data. However, little attention has been paid to criticisms of the study, including the validity of grammaticality judgments from late sequential bilinguals (Kellerman, 1995). Additionally, Bialystok and Hakuta (1994, p. 70) suggest that the length of the test, which contained 276 items with two sessions of approximately 140 items separated by a short break, may having been too taxing for older participants. Ultimately, as with the critical period, researchers have acted on the assumption that CS differs based on the type of bilingual rather than shown first that there are qualitative differences based on age of onset of exposure.

Current research indicates that preference for simultaneous bilinguals over sequential bilinguals may indeed be a false one. Notably, Montrul (2008) details just what happens when acquisition in bilingualism is incomplete. Throughout her investigation of incomplete acquisition in both first and second language

acquisition, Montrul highlights how bilingual FLA may not lead to complete development of both languages and that, in some bilingual contexts, early sequential bilinguals may actually outperform their simultaneous counterparts (p. 145). Montrul specifically looks at bilingual development in minority/heritage language situations, indicating that her conclusions should not be extended to all bilingual contexts; however, a significant amount of CS research also takes place in minority/heritage language communities. At the very least, CS researchers need to bear in mind that language acquisition is affected by more than age of onset of exposure.

Additionally, Zirker (2007) investigated differences in grammaticality judgments and processing times of early and late sequential Spanish-English bilinguals. Her study found that there was no statistical difference in responses to grammaticality judgments nor response times, although there was a trend towards early sequential bilinguals performing the task faster than late sequential bilinguals and accepting a larger number of switches. However, results from Zirker's study must be interpreted carefully, as her study group was small and consisted of only 26 participants. Zirker goes on to suggest that this indicates that there are no (detectable) age of onset of exposure effects in CS, and that the lack of difference in processing times indicates that storage and retrieval are similar for early and late sequentials (p. 70 - 71).

Criticisms of Critical Period Hypothesis Research

There are many general problems with the investigation of a critical period in SLA, as pointed out by Eubank and Gregg (1999), many of which have yet to be addressed, as outlined by Felix (2007). Initially, exploration of a critical period is fraught with theoretical issues that are both the domain of linguists and also (neuro)psychologists. From a psychological standpoint, operationalizing a critical period in SLA research requires very specific constraints that become relatively arbitrary. For instance, puberty is frequently used as an endpoint for the Critical Period in SLA, though puberty itself is drawn out over many years and, physically, has been gradually occurring at younger ages in some societies (Kaplowitz et al., 2001). Similarly, language and language acquisition are complicated constructs to implement. As Eubank and Gregg (1999) point out, though dependent on certain theoretical assumptions of language, language itself is not a unitary concept, but rather modular. As such, any discussion of a critical period would necessarily involve accounting for modularity, as illustrated in the discussion of differing levels of ultimate attainment by Genie and Chelsea (Eubank & Gregg, 1999, p. 74 - 76). Furthermore, these components of language interact with other systems, such as phonology, that are subject to different maturational constraints for different reasons.

Controlling for age and language.

Bialystok and Hakuta (1999) additionally argue that many CPH studies confound correlation with causation (p. 161-162). Those studies fail to show that

age is an intervening factor in the effects of other linguistic and cognitive factors in second language acquisition (p. 162). The evidence for the effect of age must be attributable only to age and not predicted by other factors, which may be linguistic, cognitive, or social. Similarly, the effect of age must not be contradicted by other results (p. 163). In other words, if age does affect SLA, then it must do so in a predictable and universal manner.

Bialystok and Hakuta (1999) have reason to be doubtful of many CPH studies and Eubank and Gregg (1999) also share the same skepticism, though for different reasons. Above all, Eubank and Gregg argue that *language* is not a construct that can be researched, especially in terms of the CPH (p. 66). In other words, it may be useful to talk about critical periods in the acquisition of certain linguistic phenomena, but referring to one critical period is inaccurate, given that the phenomena involved in language, such as phonology and pragmatics, are often unrelated at a neurocognitive level (p. 67). Similarly, Hyltenstam and Abrahamsson (2003) point out that a useful question in CPH research would be "what effects an increasingly constrained language learning mechanism would have across sub-components of language and across different phenomena within sub-components" (p 541). This indicates that a critical period would have predictable effects in very specific areas of SLA, such as parameter setting.

Additionally, the variance in ultimate attainment in adult learners as compared to the relative stability of acquisition in first language acquisition indicates that parameters, in the UG sense, should be the focus of most CPH

research (Eubank & Gregg, 1999, p. 88). In synthesizing Bialystok and Hakuta (1999) and Eubank and Gregg (1999), it follows that studies involving the CPH should have very clear predications about how age affects linguistic factors and those linguistic factors should be specifically outlined in terms of a theoretical framework for language acquisition.

Bilingualism as a construct.

Critical Period investigations by definition involve an expected level of ultimate attainment, often asserting that late learners, or those whose age of onset of exposure is beyond that of the critical period, rarely achieve native like competency in their L2. This native-like competency is assumed to be similar to or the same as the final state, i.e. adult grammar, of a monolingual native speaker. However, some research on bilingualism suggests that bilinguals do not perform the same as monolinguals, particularly on standardized measures similar to those used to assess attainment levels in many CP studies (Bialystok, 2007). In researching the critical period, it does not seem prudent to compare the language competency of an adult bilingual or SLL to a monolingual native speaker. A better comparison, if the goal is to understand the effect of age of acquisition on SLA, would be a simultaneous bilingual adult.

However, the notion of bilingualism is not clear cut, such that Butler and Hakuta (2004) suggest that bilingualism comprises "psychological and social states of individuals or groups of people that result from interactions via language in which two or more linguistic codes (including dialects) are used for

communication" (p. 115), which does not address proficiency whatsoever. In fact, research in SLA attainment is difficult because notions such as *proficient* and *native speaker* are certainly inherently problematic, as is *balanced bilingual* (Butler & Hakuta, 2004). Additionally, Hyltenstam and Abrahamsson (2003, p. 545) note that many researchers doubt that bilinguals ever achieve monolingual native speaker proficiency in both languages, regardless of age of onset of exposure. Despite this, it seems prudent to use adult bilinguals as a comparison rather than monolinguals, since the goal of SLA for older SLLs is generally some form of additive bilingualism, as opposed to subtractive bilingualism.

Towards a Minimalist Understanding of Second Language Acquisition

Unfortunately, most work on the CPH has been conducted in a type of theoretical void (c.f. Eubank & Gregg, 1999). Though many researchers have focused on syntax and have assumed generative frameworks, declared or not, few have chosen to elaborate on how language acquisition occurs and progresses, particularly in terms of SLA. This fails to address what effects the CPH would have on language acquisition and where those effects should be realized, while also contributing to an arguably false dichotomy of FLA as normal and SLA, by presence of the CPH, as deviant and imperfect. It is quite clear that SLA differs from FLA for a number of cognitive reasons, including the presence of another final state grammar and general cognitive maturation, both of which happen to be products of age, or rather the intersection of the linguistic and cognitive maturation processes. The question becomes whether the CPH can be defined as

a solely linguistic phenomenon, while accounting for the effects of non-linguistic factors on second language learning, as suggested by Bialystok and Hakuta (1996), among others. For these reasons, it is prudent to outline a biolinguistic, i.e. generative, theory of SLA.

Universal Grammar in Second Language Acquisition.

Mitchell and Myles (2004, p. 84 - 90) summarize four different view points on the role of UG in SLA:

1. No Access to UG;
2. Full Access to UG
    a. Full access, no transfer
    b. Full transfer, full access
    c. Full access, impaired early representations;
3. Partial Access to UG

Though some, such as Meisel (2004), argue that UG is completely unavailable in SLA, it clearly must play some role, given that language production in the second language still takes place and a generative analysis of syntactic differences and similarities would not be possible without the assumption of at least some UG principles. For instance, Flynn, Foley, and Vinnitskaya (2005) suggest that certain elements of UG, including the free relatives, are available during second and third language acquisition. Others who argue that full access to UG is available during SLA (Epstein, Flynn, & Marthardjono, 1998) must contend with

the fact that many SLL never achieve native-like, e.g. monolingual adult, competence in their second language. In this case, researchers have suggested a number of reasons for this, including the idea that parameter settings are imported from the first language (Herschensohn, 2000) or that parameter values in the second language may be initially absent, but can be reset (Epstein, Flynn, & Marthardjono, 1998).

As addressed previously, I assume a generative understanding of language, currently developed as the Minimalist Program (Chomsky 1995, 2007 for example). Briefly, language acquisition is a cognitive process driven by innate knowledge (UG), general cognitive principles, and language input, derived from the environment. Language is acquired as language knowledge systematically moves through successive states until it reaches a final state, which is equal to that of an adult monolingual native speaker grammar. It is also important to note that this model of language acquisition focuses on (morpho)syntactic knowledge and lexicon development, in so far as lexicon features are involved in morphosyntax. Though the model is monolingual, MacSwan (2000) has illustrated how the model can be successfully extended to bilingualism. It is not unreasonable to assume that UG is available to some extent during SLA, as Herschensohn (2000) points out that UG can be a form and also a strategy (p. 217). UG as a language learning strategy occurs only in FLA, while UG as a form is present in both FLA and SLA.

This approach admittedly reduces the focus of language acquisition research to the level of (morpho)syntax, making it difficult to account for non-linguistic factors in SLA. In a generative sense, sociocultural factors, while important, affect issues at the discourse level, which occur for discursive purposes, and in input. These factors may be realized in morpho-syntax, but are more a demonstration of competence through performance than a product of UG per se. The domain of UG is specifically the lexicon, formal features, and Narrow Syntax, which interfaces with phonological (S-M) and semantic/logical (C-I) components of language production. By focusing on these aspects of bilingual competence, it is possible to explore the effects age of onset may have intrasentential CS, reflecting the need outlined by both Hyltenstam and Abrahamsson (2003) and Bialystok and Hakuta (1999) to focus on specific and discrete language phenomena.

Analyzing late sequential bilingual codeswitching.

For reasons outlined above, I assume that the standard of comparison for sequential bilinguals should be simultaneous bilinguals. It follows that MacSwan's (2000) work applies to sequential bilinguals, with the crucial difference that the lexicon of the second language, with its subset of appropriate features, is most likely still being formed. However, I assume, as do White (1989, 2003) and Herschensohn (2000), that components of language production, including Narrow Syntax, Spell Out and the C-I and S-M interfaces, are involved in second language production and acquisition from the start.

As described in depth by MacSwan (1999, 2004) and above, a Minimalist framework for CS analysis has already been developed, but has yet to be applied extensively in the analysis of late sequential CS. Whether it is theoretically sound to use this approach to analyze and compare late sequential CS has yet to be determined; however, the presence of the above components along with a lexicon indicate that analysis should be possible, even if the lexicon is only partially formed. The potential problem with such an analysis lies not in the use of a Minimalist framework, but rather in the question of parameter resetting, as little consensus has been reached about how, when, and to what degree parameters are reset during SLA (c.f. Epstein, Flynn, & Marthardjono, 1998; Herschensohn, 2000; White, 1989, 2003). If parameters are reset at different times and in different ways, this would affect intrasentential CS, given that parameters can affect grammaticality. In other words, if a late sequential bilingual does not have reset parameters that completely match those of a simultaneous bilingual, then what may be a grammatical switch for a simultaneous bilingual may not be grammatical for a late sequential bilingual.

Concluding Remarks

As has been illustrated, the research on the CPH is relatively inconclusive, though many have suggested more refined directions for future research (Bialystok & Hakuta, 1999; Eubank & Gregg, 1999; Hyltenstam & Abrahamsson, 2003). Above all, the body of CPH research has demonstrated how complex language and SLA are. Not only do SLLs bring a first language to the process of

second language acquisition, but the process is made even more complex by the maturation of the brain, the development of general learning skills, and increased attention to sociocultural and sociolinguistic factors, along with the eventual physical decline of key physical traits associated with language learning, such as hearing and working memory. Above all, it is evident that UG as a form is present during SLA, if not as a language learning tool. CS is partially a product of the availability of UG, as it is with simultaneous bilinguals, regardless of why CS occurs at a discourse level. For these reasons, it is possible to analyze and compare late sequential bilingual CS within a generative (i.e. Minimalist) framework. Such an analysis may also offer more insight into what specific effects a critical period might have at the morphosyntactic level.

As data in this study come from simultaneous, early sequential, and late sequential Slovak-English bilinguals, the next sections offers an overview of the structure of Slovak. Specifically, the areas of syntax represented in the grammaticality judgment survey are discussed.

The Structure of Slovak

Slovak is a West Slavic language, like Czech, and belongs to the larger Slavic language group (Janda & Townsend, 2000, p.1). Historically, Czech has been the official language in the Slovak region, but Slovak has been the official language of Slovakia since the establishment of the first Czechoslovak Republic in 1918 (Mistrík, 1982, p. 9). Given the slow rate of standardization and the continued predominance of Czech during both Czechoslovak Republics, little

generative research has been done in Slovak and what has been done has not yet been made available outside of Slovakia. Currently, Slovak is spoken by approximately 5.6 million people worldwide (Slovak, n.d.) and is indigenous to the area of and surrounding the current Slovak Republic in central Europe.

This section will address the structure of Slovak by focusing on those areas that are represented in the survey (Appendix C). Word order will be addressed first, followed by the structure of Verb Phrases and Determiner Phrases. Finally, the prepositional system will be described with attention to how it relates to the case system. Because of the pervasiveness of agreement features in Slovak, agreement in nouns, verbs, and case will be addressed in the respective subsections.

Word Order

According to Short (2002), Slovak is an SVO language, although Short argues that this is errant as Slovak has a *functionally* free word order (p. 565). For the purposes here, it will be assumed that Slovak is an SVO language, like English, but with multiple and frequent possibilities for movement through topicalization, focus, and other discursive purposes. (10) demonstrates typical word order in declarative utterances.

(10) *Julia čit- a dobr- ú knih- u*

Julia read- 3.S good- F.S-ACC book- F.S-ACC

'Julia is reading a good book.'

Few elements have a rigid position in Slovak; however, several clitics are restricted to specific positions directly before or after their verb. For instance, the conditional clitic *by* can only occur before the finite auxiliary, as in (11).

(11) *Ø* *by* *som* *chce- l-a*

pro COND be.1.S want- PST-F.S

'I would like to'

Additionally, the reflexive clitic *sa*/*si* also occurs before the lexical verb requiring the particle, as in (12).

(12) *Ø* *by* *som* *sa* *spita-l-a*

pro COND be.1.S REFL ask- PST-F.S

'I would ask'

However, in cases where the lexical verb is moved for discourse purposes, as in (13), the reflexive clitic is stranded in its original position.

(13) *spita-l-a*$_i$ *Ø* *by* *som* *sa* $_i$

ask-PST-F.S pro COND be.1S REFL

'I would ask'

Question formation.

In order to form questions in Slovak, Mistrík (1982) suggests only that the " 'leading' word stands at the beginning of the sentence" (p. 132). However, Janda and Townsend (2000), in their account of Czech, argue that there is no special word order for interrogatives, although most questions are headed by the verb if they are yes/no and by the WH word if they are WH questions (p. 87).

Short (2002) also indicates that interrogatives in Slovak are typically derived syntactically through either verb or wh-movement (p. 567-569), though intonation may also indicate an interrogative.

To illustrate, (14a) is a declarative sentence, which could also serve as a question with the appropriate intonation. By fronting the verb, as in (14b), a yes/no question is formed.

(14a) *ty* *chce-š* *tuto* *farb-u*
2.S want-PRS.2.S DEM-ACC.F color-ACC.F
'you want this color'

(14b) *chce-š* *Ø* *tuto* *farb-u*
want-PRS.2.S pro DEM-ACC.F color-ACC-F
'do you want this color?

(14c) and (14d) are both wh-questions formed through wh-movement. In (14c), the whole wh-phrase has been fronted, whereas only the wh-element *akú* has been fronted in (14d). Finally, (14e) demonstrates how wh-questions may also be formed with the wh-element in situ, though these questions are heavily discourse dependent.

(14c) *ak-ú* *farb-u* *chce-š* *Ø*
which-ACC.F color-ACC.F want-PRS.2.S pro
'which color do you want?'

(14d) *ak-ú* *chce-š* *Ø* *farb-u*

which-ACC.F want-PRS.2.S pro color-ACC.F

'which color is it that you want?'

(14e) *ty* *chce-š* *ak-ú* *farb-u*

2.S want-PRS.2S which-ACC.F color-ACC.F

'which color do you want?'

In summary, examples (10) through (14) demonstrate a number of possible word orders in Slovak, though they do not encompass all possible word orders. As movement in Slovak is relatively unrestricted, topicalization, focus, and similar CP movement is frequent and necessarily outside the scope of this dissertation. Although Mistrík (1982) and Short (2002) offer some discussion of word order in Slovak, a full account of the possible variations unfortunately has not yet been made available.

Verb Phrases

As demonstrated above, word order in Slovak verb phrases (VPs) is relatively free, with only a few obligatory positions for clitics. This is due largely to the well-developed case and agreement system in Slovak, which will be addressed below, in the discussion of Determiner Phrases. This section will focus particularly on grammatical aspects of verbs in Slovak, and will characterize agreement, tense, negation, and modality.

Agreement.

Nominal agreement is always marked on the finite verb in Slovak, and verbs must agree in number and person with their nominal heads. These affixes are consistent across all verb types, as shown in Table 1, though stems that do not end in a vowel will go through a phonological transformation.

Ja ma-m 1.S have-1.S 'I have'	*My ma-me* 1.PL have-1.PL 'We are have'
Ty ma-š 2.S have-2.S ' have'	*Vy ma-te* 2.PL have-2.PL 'You (all) have'
On/ ona/ ono ma-Ø 3.S.M/ 3.S.F/ 3.S.N have-3.S 'He/she/it has'	*Oni ma-ju* 3.PL have-3.PL 'They have'

*Table 1 Conjugation of **mat'***

However, the copula/auxiliary *byt'* is irregular, as shown in Table 2.

Ja som 1.S COP 'I am'	*My sme* 1.PL COP 'We are'
Ty sy 2.S COP 'You are'	*Vy ste* 2.PL COP 'You (all) are'
On/ ona/ ono je 3.S.M/ 3.S.F/ 3.S.N COP 'He/she/it is'	*Oni su* 3.PL COP 'They are'

*Table 2 Conjugation of **byt'***

Tense marking.

It can be argued that Slovak really only has past tense marking, as future tense is indicated by the future modal *byt'*, similar to the case of *will* in English. The future modal *byt'* is derived from the copula *byt'*, but is structurally different in that the modal requires a nonfinite complement whereas the copula cannot take any verbal complement. Additionally, adverbs may also indicate future tense. For instance, future is indicated through *byt'* in (15), but with an adverb in (16).

(15) *Ø* *bude-m* *hra-t'* *basketball*
pro FUT-1.S play-INF basketball
'I will play basketball'

(16) z*ajtra* *Ø* *hra-m* *basketball*
tomorrow pro play-1.S basketball
'I play basketball tomorrow'

Semantically, the use of *byt'* indicates future progressive.

Past tense is marked with the finite auxiliary *byt'* and the past participle, where the verb stem receives the past participle affix, *-l-*, as in (17a). Past participles must also agree in gender and number with their nominal arguments, involving additional affixation, as in (17b-d).

(17a) *ja* *som* *ma-l-Ø* *zlý* *sen*
1.S AUX.1.S have-PST-S.M bad-M dream
'I had a bad dream'

(17b) *ona* *Ø* *ma-l-a* *zlý* *sen*

3.S.F AUX have-PST-S.F bad-M dream

'she had a bad dream'

(17c) *ono* *Ø* *ma-l-o* *zlý* *sen*

3.S.N AUX have-PST-S.F bad-M dream

'it had a bad dream'

(17d) *oni* *Ø* *ma-l-i* *zlý* *sen*

3.PL AUX have-PST-PL bad-M dream

'they had a bad dream'

Finally, (17b-d) also demonstrate how Slovak licenses auxiliary drop in both third person singular and third person plural.

Negation.

Negation in Slovak is marked on the verb with the prefix *ne-*, as in (18).

(18) *Ne-ma-l-a* *Ø* *som* *žiadn-ú*

NEG-have-PST-F pro AUX.1.S any-ACC.F

kav-ú

coffee-ACC.F

'I didn't have any coffee'

In the case of the copula *byt'*, the negative morpheme *nie* occurs before the finite form, shown in (19).

(19) *on nie je nikdy na čas*
3.SM NEG AUX.3.S never on time
'He is never on time'

In both cases, negation must also be indicated in the appropriate noun phrase and through any corresponding adverbs.

Modality.

Like English, Slovak employs a number of modal auxiliaries to indicate modality. As shown in (20a), the modal stem receives finite nominal agreement marking, while the modal auxiliary itself licenses a nonfinite verb (phrase) as its compliment.

(20a) Ø *chce-me kupi-t' auto*
pro want-1.PL buy-INF car
'we want to buy a car'

(20b) *chce-l-i Ø sme kupi-t' auto*
want-PST-PL pro AUX-1.PL buy-INF auto
'we wanted to buy a car'

(20c) c*hce-l-i Ø by sme kupi-t' auto*
want-PST-PL pro COND AUX-1.PL buy-INF auto
'we would like to buy a car'

(20d) *on* *by* *Ø* *chcel* *kupit'* *auto*

3.S.M COND AUX-3.S want-PST-M buy-INF car

'he would like to buy a car'

(20b) demonstrates how past tense is formed from modal auxiliaries, similar to the way past tense is formed with regular verbs. In (20c), the conditional particle *by* is one of the few morphemes in Slovak that has a rigid position, as discussed above, and must occur directly before the finite auxiliary *byt'*. It is worth noting, as shown in (20d), that the conditional particle *by* still occurs in its position in cases of auxiliary drop.

Determiner Phrases

Determiner phrases (DP) in Slovak are complex in that they are the locus for both case marking and case, number, and gender agreement. This complexity enables the relatively free word order of Slovak, particularly in the case of split-DPs.

Gender.

Slovak has three genders (masculine, feminine, and neuter), and feminine and neuter further subcategorize for particular phonological patterns, the most common shown in Table 3. The masculine gender subcategorizes for animacy and then further subcategorizes for phonological patterns, as illustrated below in Table 4.

Feminine				Neuter			
-a	-a	-ň	-ť	-o	-e	-ie	-a/ä
žena ‘woman’ *teta* ‘aunt’	*ulica* ‘street’ *hadi-ca* ‘hose’	*dlaň* ‘palm’ *pekareň* ‘bakery’	*kosť* ‘bone’ *hluposť* ‘stupidity’	*mesto* ‘city’ *slovo* ‘word’	*srdce* ‘heart’ *plece* ‘shoulder’	*vysvedčenie* ‘certificate’ *vzdelanie* ‘education’	*dievča* ‘girl’ *bábä* ‘newborn’

Table 3 Phonological patterns for feminine and neuter in Slovak

Table 4 illustrates common patterns for masculine animate and inanimate categories, though these are not phonologically determined. The patterns are derived instead from the nominative plural ending licensed in each subclass. Short (2002) addresses the Slovak system in more detail (p. 540-546), as does Mistrík (1983).

Case.

Like many other Slavic languages, Slovak has a highly developed case system. Six cases are actively used in modern Slovak – nominative, accusative, genitive, dative, locative, and instrumental – though additionally Short (2002) points out that vocative case survives in a few formulaic expressions (p. 540). Case is morphologically marked on the noun, and morphological case endings also reflect the gender and number features of the noun. Tables 5 through 8 on the following pages demonstrate how nouns are marked for case and number

according to gender. Certain classes of nouns, such as *dievčata* in Table 8, also have two plural forms.

	Masculine Animate			Masculine-Inanimate	
	Nominative Singular	Nominative Plural		Nominative Singular	Nominative Plural
-Ø	*muž-Ø* ‘man’	*muž-i* ‘men’	-Ø	*dub-Ø* ‘oak tree’	*dub-y* ‘oak trees’
	chlap-Ø ‘guy’	*chlap-i* ‘guys’		*telefón-Ø* ‘telephone’	*telefón-y* ‘telephones’
-a	*hrdin-a* ‘hero’	*hrdin-ovia* ‘heroes’	-Ø	*stroj-Ø* ‘machine’ *boj-Ø* ‘fight’	*stroj-e* ‘machines’ *boj-e* ‘fights’
	rozhodc-a ‘referee’	*rozhodc-ovia* ‘referees’		*kamen-Ø* ‘rock’	*kamen-e* ‘rocks’
-Ø	*školiteľ-Ø* ‘tutor’	*školitel-ia* ‘tutors’		*hrniec-Ø* ‘pot’	*hrnc-e* ‘pot’

Table 4 Plural patterns for masculine animate and inanimate nouns in Slovak

In a classic example, (21a-c) illustrate how case assignment and agreement allow fronting of discourse-appropriate elements.

(21a) *farmár-Ø* *Ø* *zabil-Ø* *kačk-u*

farmer-NOM.M AUX kill-PST.M duck-ACC.F

'the farmer killed the duck'

(21b) *kačk-u* *Ø* *zabil-Ø* *farmár-Ø*

duck-ACC.F AUX kill-PST.M farmer-NOM.M

'the farmer killed the duck'

(21c) *kačk-a* *Ø* *zabil-a* *farmár-a*

duck-NOM.F AUX kill-PST.F farmer-ACC.M

'the duck killed the farmer'

(21a) demonstrates the base SVO order, while *kačk-u* is fronted in (21b). However, because of case marking and agreement between the nominal element and the past participle, (21b) and (21c) have entirely different meanings.

Agreement in Determiner Phrases.

Agreement in gender, number and case is required in past participles, adjectives, and determiners, as in (22).

(22) *tá* *biel-á* *mačk-a* *chce-l-a* *výskoči-t'*

DEM.F white-NOM.F cat-NOM.F want-PST-F jump-INF

z *okn-a*

from.LOC window-LOC.N

'This white cat wanted to jump out of the window'

Similarly, (23a-b) illustrate how agreement in VPs and DPs is maintained across movement.

(23a) *Ø* *by* *Ø* *bo-l-o* *pekn-é* *ma-ť*

pro COND AUX COP-PST-N nice-N have-INF

veľk-eho *krasn- eho* *ps-a*

big-ACC.M beautiful-ACC. M dog-ACC.M

'It would be nice to have a big, beautiful dog'

			Nominative	Accusative	Dative	Genitive	Locative	Instrumental
Masculine- Animate	*-Ø* *muž-Ø*	Singular	*-Ø* *muž-Ø*	*-a* *muž-a*	*-ovi* *muž-ovi*	*-a* *muž-a*	*-ovi* *muž-ovi*	*-om* *muž-om*
		Plural	*-i* *muž-i*	*-ov* *muž-ov*	*-om* *muž-om*	*-ov* *muž-ov*	*-och* *muž-och*	*-mi* *muž-mi*
	-a *hrdin-a*	Singular	*-a* *hrdin-a*	*-u* *hrdin-u*	*-ovi* *hrdin-ovi*	*-u* *hrdin-u*	*-ovi* *hrdin-ovi*	*-om* *hrdin-om*
		Plural	*-ovia* *hrdin-ovia*	*-ov* *hrdin-ov*	*-om* *hrdin-om*	*-ov* *hrdin-ov*	*-och* *hrdin-och*	*-mi* *hrdin-ami*
	-Ø *školiteľ-Ø*	Singular	*-Ø* *školiteľ-Ø*	*-a* *školiteľ-a*	*-ovi* *školiteľ-ovi*	*-a* *školiteľ-a*	*-ovi* *školiteľ-ovi*	*-om* *školiteľ-om*
		Plural	*-ia* *školitel-ia*	*-ov* *školitel-ov*	*-om* *školitel-om*	*-ov* *školitel-ov*	*-och* *školitel-och*	*-mi* *školitel-mi*

Table 5 Masculine animate case endings in Slovak

			Nominative	Accusative	Dative	Genitive	Locative	Instrumental
Masculine- Inanimate	*-Ø* *dub-Ø*	Singular	*-Ø* *dub-Ø*	*-Ø* *dub-Ø*	*-u* *dub-u*	*-a* *dub-a*	*-e* *dub-e*	*-om* *dub-om*
		Plural	*-y* *dub-y*	*-y* *dub-y*	*-om* *dub-om*	*-ov* *dub-ov*	*-och* *dub-och*	*-mi* *dub-mi*
	-Ø *stroj-Ø*	Singular	*-Ø* *stroj-Ø*	*-Ø* *stroj-Ø*	*-u* *stroj-u*	*-a* *stroj-a*	*-i* *stroj-i*	*-om* *stroj-om*
		Plural	*- e* *stroj-e*	*- e* *stroj-e*	*-om* *stroj-om*	*-ov* *stroj-ov*	*-och* *stroj-och*	*-mi* *stroj-mi*

Table 6 Masculine inanimate case endings in Slovak

			Nominative	Accusative	Dative	Genitive	Locative	Instrumental
Feminine	*-a* *žena*	Singular	*-a* *žen-a*	*-u* *žen-u*	*-e* *žen-e*	*-y* *žen-y*	*-e* *žen-e*	*-ou* *žen-ou*
		Plural	*-y* *žen-y*	*-y* *žen-y*	*-ám* *žen-ám*	*-Ø* *žien*	*-ách* *žen-ách*	*-ami* *žen-ami*
	-a *ulica*	Singular	*-a* *ulic-a*	*-u* *ulic-u*	*-i* *ulici-i*	*-e* *ulic-e*	*-i* *ulic-i*	*-ou* *ulic-ou*
		Plural	*-e* *ulic-e*	*-e* *ulic-e*	*-iam* *ulic-iam*	*-Ø* *ulíc-Ø*	*-iach* *ulic-iach*	*-ami* *ulic-ami*
	-ň *dlaň*	Singular	*-Ø* *dlaň-Ø*	*-Ø* *dlaň-Ø*	*-i* *dlan-i*	*-e* *dlan-e*	*-i* *dlan-i*	*-ou* *dlaň-ou*
		Plural	*-e* *dlane*	*-e* *dlane*	*-iam* *dlan-iam*	*-í* *dlan-í*	*-iach* *dlan-iach*	*-iami* *dlan-iami*
	-ť *kosť*	Singular	*-Ø* *kosť*	*-Ø* *kosť*	*-i* *kost-i*	*-i* *kost-i*	*-i* *kost-i*	*-ou* *kost'-ou*
		Plural	*-i* *kost-i*	*-i* *kost-i*	*-iam* *kost-iam*	*-í* *kost-í*	*-iach* *kost-iach*	*-ami* *kost'-ami*

Table 7 Feminine case endings in Slovak

			Nominative	Accusative	Dative	Genitive	Locative	Instrumental
Neuter	*-o* *mesto*	Singular	*-o* *mesto*	*-o* *mest-o*	*-u* *mest-u*	*-a* *mest-a*	*-e* *mest-e*	*-om* *mest-om*
		Plural	*-á* *mest-á*	*-á* *mest-á*	*-ám* *mest-ám*	*-Ø* *miest*	*-ách* *mest-ách*	*-ami* *mest-ami*
	-e *srdce*	Singular	*-e* *srdc-e*	*-e* *sdc-e*	*-u* *srdc-u*	*-a* *srdc-a*	*-i* *srdc-i*	*-om* *srdc-om*
		Plural	*-ia* *srdc-ia*	*-ia* *srdc-ia*	*-iam* *srdc-iam*	*-Ø* *sŕdc-Ø*	*-iach* *srdc-iach*	*-ami* *srdc-ami*
	-ie *vzdelanie*	Singular	*-ie* *vzdelan-ie*	*-ie* *vzdelan-ie*	*-ia* *vzdelan-ia*	*-iu* *vzdelan-iu*	*-í* *vzdelan-í*	*-ím* *vzdelan-ím*
		Plural	*-ia* *vzdelan-ia*	*-ia* *vzdelan-ia*	*-iam* *vzdelan-iam*	*-í* *vzdelan-í*	*-iach* *vzdelan-iach*	*-iami* *vzdelan-iami*
	-a/ä *dievča*	Singular	*-a* *dievč-a*	*-a* *dievč-a*	*-ať u* *dievč-ať u*	*-ať a* *dievč-ať a*	*-ati* *dievč-ati*	*-ať om* *dievč-ať om*
		Plural	*-atá* *dievč-atá*	*-atá* *dievč-atá*	*-atam* *dievč-átam*	*-iat* *dievč-iat*	*-atách* *dievč-atách*	*-atách* *dievč-atami*
		Plural (5+)	*-ence* *dievč-ence*	*-ence* *dievč-ence*	*-encom* *dievč-encom*	*-eniec* *dievč-eniec*	*-encoch* *dievč-encoch*	*-encami* *dievč-encami*

Table 8 Neuter case endings in Slovak

(23b) *ma-ť* *veľk-eho* *krasn-eho* *ps-a* *Ø*

have-INF big-ACC.M beautiful-ACC. M dog-ACC.M pro

by *Ø* *bo-l-o* *pekn-é*

COND AUX COP-PST-N nice-N

'It would be nice to have a big, beautiful dog'

As stated previously, and demonstrated in examples (21) through (23), the well developed case and agreement system enable movement in Slovak by maintaining relationships between the various elements.

Prepositions

Prepositions in Slovak always assign case, and have been included in the discussion of DPs for this reason. Table 9 lists common prepositions and their cases. *Na* occurs as both an accusative and a locative preposition, depending on the type of the verb it complements. Nominative and dative are not licensed by prepositions, and therefore do not appear in the table. (22), repeated here, provides an example of case assignment through prepositions. *Z okn-a* is a locative prepositional phrase, and *okn-o* receives the locative neuter ending *–a*.

(22) *tá* *biel-á* *mačk-a* *chce-l-a* *výskoči-t'*

DEM.F white-NOM.F cat-NOM.F want-PST-F jump-INF

z *okn-a*

from.LOC window-LOC.N

'This white cat wanted to jump out of the window'

Accusative	Genitive	Instrumental	Locative
pre 'for'	*z* 'off'	*s* 'with'	*v* 'in'
za 'for'			*pri* 'near'
pod 'under'			*o* 'about'
na 'on'			*na* 'on'

Table 9 Common Slovak prepositions and their cases

The Relationship between Slovak and English

Though there is little historical relationship between Slovak and English, there are a number of structural similarities that would be relevant for CS. For instance, past tense in Slovak and English can be expressed through an auxiliary/ part participle construction, while future tense can be derived with a modal. Finally, Slovak and English seem to pattern for the same base SVO word order and the same DP word order.

Despite these similarities, there are a number of significant differences that make the study of Slovak-English CS interesting. For instance, the well-developed case and gender agreement system in Slovak, compared to the

relatively non-existent system in English, suggests that CS may be constrained by the case system in Slovak. In addition, another question might be whether prepositional phrases mark a CS boundary, given that prepositions also assign case in Slovak. Further, the relatively free word order of Slovak contrasts sharply with the rigid word order in English, indicating that word order in Slovak-English CS may be slightly restricted.

Neither the above description of Slovak nor the comparison between Slovak and English is comprehensive; however, they do offer a basis for exploring Slovak-English CS. The above sections address structures that appear in the judgment survey, described in more detail in Chapter Three, and provide a context for the subsequent analysis in Chapter Four.

Research Methods

The use of quantitative data in exploring grammaticality issues in CS allows researchers to systematically investigate patterns across groups in ways that qualitative data cannot. Importantly, the research methods used must reflect both the question(s) and the nature of the data. This chapter outlines the research questions, data collection and instrumentation, and participant data for the current study. The statistical methods will also be described in detail, with particular focus on the nature of the procedures and their appropriateness.

Research Questions

This study investigates the effect of age of onset of exposure on grammaticality judgments. While the population being studied comprises bilinguals generally, the sample consists of Slovak-English bilinguals (N = 39). As a major theoretical assumption of the study is the universal nature of language acquisition, representation, and storage, the language pair should not affect the generalizability of the analysis to other bilingual populations, though other factors detailed below will.

Given this, the primary research question of the study is

1. Do Slovak-English codeswitchers evidence differences in grammaticality judgments as a function of onset of exposure to English?

In addition, another research questions arises from this primary question, namely

2. What do other datasets, particularly the Siarad Corpus (http://www.siarad.org.uk/), demonstrate in terms of the effect of age of onset of exposure?

Data collection

Codeswitching Research and Grammaticality Judgments

As in other areas, researchers in CS tend to prefer certain types of data. For instance, Myers-Scotton (2006b) has argued that only naturalistic data can inform CS research, since it is the only type of data that occurs in everyday situations. Similarly, Mahootian and Santorini (1996) have critiqued Belazi, Rubin, and Toribio (1994) for relying on grammaticality judgments to support their Functional Head Constraint, echoing Bentahila and Davies (1983) in arguing that a negative CS grammaticality judgment does not always constitute a syntactic constraint. Others (for instance Toribio & Rubin, 1994; MacSwan, 2005, MacSwan & McAlister, 2010) prefer grammaticality judgments, which capture negative evidence, i.e. data that would never occur in naturalistic contexts because it is ungrammatical. (See MacSwan & McAlister, 2010, for further discussion.)

Though the type of data collected is important, Schütze (1996) argues that grammaticality judgments alone do not suffice in creating a high quality study, but rather that grammaticality judgments must be part of a well-designed methodology that includes particular attention to informants and analysis. Informants, for instance, should be members of the community of the language being studied and should preferably not be linguists or the actual researcher(s) (p.

186). In addition, how the tasks are presented and which rating scales are employed can also affect the reliability of the study. This design of this study incorporates these points, particularly in terms of the scale design and participants.

Instrumentation

Data for this study were collected through an on-line survey, administered through Qualtrics, an on-line survey program (see http://www.qualtrics.com). The survey consists of three parts: demographic questions, grammaticality judgments, and attitudinal questions.

Demographic data.

The demographic data survey, provided in Appendix B, primarily served to collect information about a participant's language history. Questions were asked regarding the home language environment of the participants as well as the language(s) of instruction throughout the participant's schooling and the language(s) used in the participant's workplace. Bilingual and age of onset of exposure constructs, discussed below, were developed based on participant responses to these questions.

Grammaticality judgments.

The main section of the survey instrument consists of grammaticality judgments (see Appendix C). The items in this section, which are discussed in more detail in the following subsections, elicited participant judgments about the grammaticality of both monolingual and bilingual utterances. The grammaticality

judgment section was divided into five subsections: three priming subsections and two CS sections.

Priming tasks.

The priming subsections include one Slovak monolingual section and one English monolingual section. Each section asked for judgments on monolingual statements that were either grammatical or ungrammatical, and one statement that was grammatical but questionable, as in (23).

(23) John gave pictures of each other to the kids

The third subsection contains priming items for the CS judgment tasks. These items were divided into acceptable switches and switches between a subject pronoun and the VP, which should be ungrammatical based on van Gelderen and MacSwan (2008).

Codeswitching tasks.

The bulk of the survey is contained in the CS sections. Overall, the items explore constraints on Slovak-English CS in specific conditions. However, two different tasks were used to ellicit judgments. In the first subsection, a traditional judgment task was employed, as shown in (24).

(24) The cat *ho poškrabala na nohe*

Do you think this sounds correct?

a. Sounds fine

b. Sounds odd, but it's probably okay

c. Sounds odd and is likely wrong

d. Sounds wrong

For these judgment tasks, a four – point acceptability scale was employed, as piloting indicated a strong preference for the middle point of a three point scale indicating marked utterances (*Sounds odd*). By dividing the questionable option into two options – *Sounds odd but probably okay* and *Sounds odd and probably wrong* – participants were forced to make an acceptability judgment about the test item even when it could be judged as marked.

The second task type required participants to indicate a preference for a particular switch. In this task, similar switches were presented and participants were asked to choose which switch they preferred, as shown in (25).

(25) Please indicate which sentence sounds better.

a. *Prečo nenakupuješ v* Polish store?

b. *Prečo nenakupuješ v* the Polish store?

c. Neither

This task complements the traditional grammaticality judgments by using prompt pairs that were presented independently in the traditional gramamticality judgments. In this way, the ranking tasks substantiate responses to the traditional judgment tasks.

Syntactic contexts.

A number of syntactic contexts are represented by the CS grammaticality judgment tasks. Given the lack of previous data on Slovak-English CS, the survey was designed to capture a general description of the possibilities in

Slovak-English CS rather than exploring one or two particular syntactic contexts in depth.

Several judgment items presented switches in variable word order. For instance, (26a-c) illustrate potential word orders for a declarative switch involving a nominal determiner phrase in English and a Slovak verb phrase.

(26a) The cat *poškrab-al-a ho na noh-e*
DET cat scratch-PST-F M.ACC on leg-FEM.LOC
'the cat scratched him on the leg'

(26b) The cat *ho poškrab-al-a na noh-e*
DET cat M.ACC scratch-PST-F on leg-FEM.LOC
'the cat scratched him on the leg'

(26c) *Poškrab-al-a ho* the cat *na noh-e*
scratch-PST-F M.ACC DET cat on leg-FEM.LOC
'the cat scratched him on the leg'

Given the well-developed case system in Slovak, judgment items were also constructed to explore switches involving case-marked positions.

(28) We celebrate-d Christmas *u babk-y*
1.PL celebrate-PST Christmas at grandmother-FEM.GEN
'we celebrated Christmas at grandmother's (house)'

In addition, contexts where the switch occurs across a case marking relationship, such as in (28) and (29), were also developed.

(28) I took the *ps-a* *na* *prechádzk-u*
1.S took DET dog-M.ACC on walk-F.ACC
'I took the dog for a walk'

(29) *Musel* *som* *krmi-ť* my neighbor's
pro must-PST.M AUX.1S feed-INF POSS.1S neighbor-POSS
fish *cez* *víkend*
fish over weekend
'I had to feed my neighbor's fish over the weekend'

In these two switches, the verb licenses accusative case in its complement noun phrase.

Judgment items also queried the grammticality of the presence of an English determiner in certain contexts, such as those in 30(a-b).

(30a) *Prečo* *nenakupuješ* *v* Polish store?
why pro NEG-buy-2.S in Polish store
'why don't you shop in the Polish store?'

(30b) *Prečo* *nenakupuješ* *v* the Polish store?

why pro NEG-buy-2.S in DET Polish store

'why don't you shop in the Polish store?'

Switches involving modals were also developed into judgement items, as in (31), in order to explore switching between a modal and a nonfinite verb.

(31) *Budeme* travel to Brighton?

will-1.PL pro travel to Brighton

'will we travel to Brighton?'

Finally, judgments involving the English progressive and a Slovak auxilliary, as in (32), were included.

(32) *Trošku* *bol-a* bleed-ing

little pro AUX.PST-FEM bleed-PROG

'she was bleeding a bit'

Attitudinal data.

Questions in the attitudinal section, provided in Appendix D, explored who the participant was likely to switch with, how the participant felt when others codeswitched, and, finally, which situations the participant felt were appropriate for CS. Despite the availability of this data, the current study will not provide an analysis of the participants' attitudes towards CS. Attitudinal data was only used to develop a construct measuring the negativity of the participant's attitude towards CS.

Participants

Participants in this study (N= 39) were recruited through word of mouth and a number of Slovak heritage organizations, such as the British Czech and Slovak Association (http://www.bcsa.co.uk). The participants came from a variety of backgrounds and lived all over the world, including the United States, Slovakia, the United Kingdom, and the Czech Republic. As shown in Table 10, the participants had varied occupations and ages (M = 36.6, SD = 14.2 for age). Further, 33.3% of the participants were male while 66.7% were female.

Table 10 Age and Occupation of Participants (continued on the next page)

Participant	Gender	Age in Years	Occupation
1	Male	32	International Assignment Manager
2	Female	34	Barista
3	Female	36	Administrative Officer
4	Female	29	Registry Officer
5	Female	32	Student/ Nanny
6	Female	75	Retired Clinical Psychologist
7	Male	32	Project Manager
8	Female	32	Clerical
9	Female	31	Administrative Assistant
10	Female	26	Student
11	Female	33	University Administration
12	Male	25	Catering
13	Male	32	Tenant
14	Female	29	Export Coordinator
15	Male	19	Student
16	Female	23	Student
17	Male	19	Student
18	Female	30	Housewife
19	Male	65	University Professor
20	Female	26	Teacher
21	Female	36	School Psychologist
22	Male	31	Lawyer
23	Female	30	Housewife
24	Male	33	Administration

Participant	Gender	Age in Years	Occupation
25	Female	29	Financial Assistant
26	Male	35	IT Professional
27	Female	36	Administrative Assistant
28	Female	36	Teaching Assistant
29	Female	29	HR Assistant
30	Female	32	Administrator
31	Female	32	Risk Analyst
32	Male	56	Database Programmer
33	Female	51	Crew Person
34	Female	56	Planner
35	Female	44	Senior Research Specialist
36	Male	64	Scientist
37	Female	34	Secretary
38	Female	31	Web Editor
39	Male	79	Retired

Table 10 Age and Occupation of Participants

Examination of participants' reported daily language use, including languages used at work, with children, and with other persons in the household indicates that the majority of the participants used Slovak and English on a daily basis, as shown in Table 11.

Languages in Daily Use	***Number of Participants***	***Percent***
English	7	17.9 %
Both Slovak and English	30	76.9%
Slovak, English and other languages	2	5.1%

Table 11 Languages in Daily Use

The participants who used other languages in addition to Slovak and English reported using Hungarian and Persian. Of those who used only English on a daily basis, five reported using Slovak with friends and two reported using Slovak with parents.

Responses to the question "How do you feel about mixing Slovak and English?" (N = 39) show that seven participants (17.9%) felt that it was never okay to mix Slovak and English, while 31 participants (79.5%) indicated that the appropriateness of mixing Slovak and English depended on the conversation partner. Further, one participant (2.6%) indicated that it was always okay to mix Slovak and English. As shown in Table 12 below, there was no significant relationship between bilingual group and attitude towards codeswitching.

Results from a chi-square test of independence conducted to determine whether there was a relationship between attitude towards CS and inclusion in the early sequential or late sequential group were nonsignificant, χ^2 (2, N = 37) = 0.59, p = 0.74, though four cells had an expected count of less than five. The simultaneous group was too small to include in the chi square, but it is interesting to note that both simultaneous bilinguals exhibited a negative attitude toward CS.

	Always acceptable	Depends on conversation partner	Never acceptable
Simultaneous (N = 2)	0 (P = 0.0)	0 (P = 0.0)	2 (P = 1.0)
Early Sequential (N = 13)	0 (P = 0.0)	11 (P = 0.85)	2 (P = 0.15)
Late Sequential (N = 24)	1 (P = 0.04)	20 (P = 0.83)	3 (P = 0.13)

Table 12 Attitudes towards CS by bilingual group

Independent Variables

The independent variable in this study is bilingual type as measured through the age of onset of exposure to English, indicated by answers to demographic questions about when the participant started to learn English and which languages are used when speaking with parents. The construct is categorical, and consists of three categories: simultaneous, early sequential, and late sequential. Table 13 on the following page depicts the age at which each participant started learning English and what category of bilingual s/he falls into.

The simultaneous bilingual category comprises those participants who reported starting to learn English before the age of three, but indicated that they spoke Slovak and English with at least one parent. Only two participants are in this category.

The early sequential bilingual category (N = 13) includes those participants who reported starting to learn English between the ages of three and 10. This age range was chosen because age ten represents the uppermost approximate age at which a first language reaches its mature state (Montrul, 2008, p. 266-7). Participants in this category largely started to learn English as a foreign language in school, although one reports English as the medium of instruction in primary school.

The late sequential bilingual category (N = 24) includes those participants who started learning English from the age of 11. Again, as with the early sequential bilingual category, most participants started learning English as a foreign language, though not all attended school in Slovak medium contexts. In particular, one participant attended a Hungarian-Slovak school and another attended a German-medium school outside of Slovakia. Further, several participants within this group reported starting to learn English from the age of 19 onwards. These participants began learning English after the end of secondary school, largely either at university or upon arrival in an English-speaking country.

Table 13 Participants' Age of onset of English (continued on next page)

Participant	Self-reported Age of Onset of Learning English	Category of Bilingual
1	12	Late Sequential
2	21	Late Sequential
3	12	Late Sequential
4	9	Early Sequential
5	22	Late Sequential
6	20	Late Sequential
7	10	Early Sequential
8	14	Late Sequential

Participant	Self-reported Age of Onset of Learning English	Category of Bilingual
9	12	Late Sequential
10	6	Early Sequential
11	20	Late Sequential
12	6	Early Sequential
13	15	Late Sequential
14	18	Late Sequential
15	11	Late Sequential
16	5	Early Sequential
17	10	Early Sequential
18	10	Early Sequential
19	birth	Simultaneous
20	10	Early Sequential
21	10	Early Sequential
22	12	Late Sequential
23	10	Early Sequential
24	13	Late Sequential
25	10	Early Sequential
26	12	Late Sequential
27	13	Late Sequential
28	8	Early Sequential
29	10	Early Sequential
30	16	Late Sequential
31	13	Late Sequential
32	33	Late Sequential
33	31	Late Sequential
34	11	Late Sequential
35	28	Late Sequential
36	21	Late Sequential
37	15	Late Sequential
38	25	Late Sequential
39	birth	Simultaneous

Table 13 Participants' Age of onset of English

Table 14 depicts the bilingual categories along with the number of participants in each group and the mean age of onset of exposure for that group. The self-reported age of onset of exposure was cross-checked with the reported

family language history and language of schooling in order to confirm inclusion in each category.

Category of Bilingual	Number of Participants	Percentage of Participants	Mean Age of Onset of Exposure
Simultaneous	2	5.1%	N/A
Early Sequential	13	33.3%	8.8 (SD = 1.88)
Late Sequential	24	61.5%	17.5 (SD = 6.49)

Table 14 Composition of Bilingual Categories

Dependent Variables

The dependent variables include the composite response to each traditional grammaticality judgment and responses to the ranking tasks. The composite responses to the traditional grammaticality judgments, as in (33), are derived by computing the mean response from each task, which was repeated twice during the survey.

(33) The cat *poškrabala ho na nohe*

Do you think this sounds correct?

a. Sounds fine

b. Sounds odd, but it's probably okay

c. Sounds odd and is likely wrong

d. Sounds wrong

The four point scale was collapsed into the traditional three point scale of grammaticality – acceptable, questionable, unacceptable – by deriving a mean

response for each participant for each task and then converting the score to the three point scale, as shown in Table 15.

Mean Response Range	Grammaticality
1 -2	Acceptable
2.5	Questionable
3 - 4	Unacceptable

Table 15 Conversion of Mean Response to Grammaticality

Mean scores ranged from 1 – 4, with .5 intervals, so that a judgment task that received a 2 (*Sounds odd, but it's probably okay*) during the first presentation and a 3 (*Sounds odd and is likely wrong*) received a mean score of 2.5, indicating that the switch in the task was questionable. Similarly, tasks that received a 1 (*Sounds fine*) and a 4 (*Sounds odd*) during both presentations also received a mean score of 2.5. Tasks that received either a 1 (*Sounds fine*) or a 2 (*Sounds odd, but it's probably okay*) had a mean score between 1 and 2, indicating that the switch was acceptable, while tasks receiving either a 3 (*Sounds odd and is likely wrong*) or a 4 (*Sounds odd*) had a mean score between 3 – 4, indicating that the switch was unacceptable.

The responses to the ranking tasks are the second set of dependent variables in this study, illustrated in (34).

(34) Please indicate which sentence sounds better.

a. *Čo by si chcel* for breakfast?

b. *Čo by si chcel na* breakfast?

c. Neither

These tasks complement switches queried in the traditional grammaticality judgments and serve to determine participant preference for switches in particular syntactic contexts.

Finally, in order to assess the internal reliability of the survey items, Cronbach's alpha coefficient was calculated. The Cronbach alpha coefficient for this study was 0.91, indicating that the survey items were internally consistent.

Statistical Methods

As this study encompasses two sets of data, namely the grammaticality judgments of Slovak-English bilinguals and the naturalistic data available through the Welsh-English Siarad corpus, two different measures are used. This reflects the differing natures of the data, particularly sample size and type of data.

Chi Square Goodness of Fit

In order to analyze the grammaticality judgment data, a chi square goodness of fit test is employed for each judgment task to determine whether participants generally preferred one switch, regardless of bilingual group. The chi square goodness of fit test measures whether the given set of frequencies is different from the expected set of frequencies. If the measured frequencies of responses for a judgment task differ from the expected frequencies, then a

statistically significant result indicates that the null hypothesis is false. Further, a goodness of fit test can also show whether any response is significantly preferred. As the dependent variable has more than two levels, follow-up tests will be conducted to show which response is significantly preferred to the others.

The goodness of fit test assumes first that the observations in the data set are from a random sample and, secondly, that those observations are also independent of each other. As the grammaticality judgment data are independent observations, i.e. no participant provided two responses for the same task, the goodness of fit test will provide a statistically descriptive account of the responses for each task.

Chi Square Test for Independence

The measure employed for exploring the effect of bilingual group on grammaticality judgments and ranking tasks was the chi square test for independence, an inferential statistic that measures the association between two categorical variables. As the independent categorical variables in this study include age of onset of exposure (early sequential or late sequential bilingualism) and the dependent categorical variables are the acceptability of the task item (acceptable, questionable, unacceptable), the chi square would be based on an *R X C* table, such as Table 16.

	Acceptable	*Marked*	*Unacceptable*
Early Sequential			
Late Sequential			

Table 16 Sample Contingency Table

The chi square test of 2 x 3 is adequate for testing the association of the acceptability of a syntactic structure with a particular age of onset. As a non-parametric test, the chi square tests whether the factors in the contingency cells are significantly associated, i.e. whether the chance of occurrence exceeds the expected proportion for that cell if there were no association between the two factors. If the chance of occurrence is higher than what is expected, then there is an association between the two factors. However, the chi square only tests whether two factors are associated, not the degree to which they are associated (Glass & Hopkins, 1996, p. 338).

The chi square test for independence rests on two main assumptions. The first is that no more than 25% of the cells in the contingency table can have an expected frequency of less than 5%. Further, no cell should be less than one. Finally, Dancey and Reidy (2002) point out that a chi square test always produces a positive value, but hypotheses must be carefully formulated in predicting the direction of the association between the two factors (p.271-272).

Hypotheses.

The hypotheses for the Chi Square analyses are based on Research Question1, which is repeated below.

1. Do Slovak-English codeswitchers evidence differences in grammaticality judgments as a function of onset of exposure to English?

   As only the early sequential group and the late sequential group are large enough to use in a statistical analysis, the hypotheses below are limited to these two groups.

   a. The grammaticality judgments of late sequential Slovak-English bilinguals will differ from the grammaticality judgments of early sequential Slovak-English bilinguals.
   b. There will be no difference in the grammaticality judgments of late sequential and early sequential Slovak-English bilinguals (null hypothesis).

The data from the simultaneous bilingual participants will be compared to the Chi Square analyses as a case study, given the small size of the simultaneous bilingual group (N=2).

The Siarad Corpus Study

In answering questions about the effect of age of onset of exposure in CS, it is useful to explore different populations, in particular different language pairs. In this case, the Welsh-English Siarad corpus (http://www.siarad.org.uk/siarad.php) can serve as a secondary dataset to the Slovak-English grammaticality judgments. McAlister and Lloyd (2009) presented a comparative analysis of chronological age and age of onset of exposure in the occurrence of various tokens in the corpus, and this section will

offer an in-depth discussion of the research methods for that age of onset of exposure analysis.

Research methods

As this is a corpus-based study, it differs from judgment task studies in that the CS data are entirely naturalistic. Naturalistic data offer a unique window into how CS actually occurs, and are preferred by some researchers to elicited data (c.f. Mahootian & Santorini, 1996; Myers-Scotton, 2006b). The nature of naturalistic corpus data affects the type of research questions that can be asked, but does not exclude the use of statistical analyses in answering those questions.

Research questions.

Whereas the research questions in the Slovak-English CS study revolved around responses to grammaticality tasks, the research questions for this sub-study explore the relationship between use of certain tokens and the age of acquisition of the speaker, quantified as age of onset of exposure. The overarching questions are as follows:

1.) Does age of acquisition have a significant effect on the number of English tokens a Welsh-English bilingual uses in bilingual speech?
2.) Does age of acquisition have a significant effect on the number of mixed tokens a Welsh-English bilingual uses in bilingual speech?
3.) Does age of acquisition have a significant effect on the number of undetermined tokens a Welsh-English bilingual uses in bilingual speech?

Given the data available in the corpus and the accompanying survey, these questions can be answered using statistical methods, specifically an ANOVA.

Description of corpus.

The Siarad corpus consists of approximately 40 hours of informal conversation between two or more speakers, with an estimated total of 167 speakers. Recordings were transcribed according to the CHAT format in CHILDES (MacWhinney, 2000), and the transcriptions themselves include gloss and translation tiers for each clause. Demographic data such as chronological age, age of acquisition and first language were collected through an accompanying survey.

Participant data.

Criteria for inclusion in this study included the identification of either Welsh or English as a first language, the availability of the speaker‘s language learning history, and completed transcription (N = 122). Two participants were removed from the study because each had learned both English and Welsh as additional languages.

In coding the data for quantitative analysis, several variables were constructed in order to capture the nuances of the data. The age of acquisition was determined first from the survey data, and a subsequent composite variable including the L1 was also created. Lastly, normed token means for each participant were calculated from the corpus data.

Age of acquisition constructs.

Age of acquisition is preferred in this sub-study to the age of onset of exposure employed with the Slovak-English data, as the questionnaire accompanying the Siarad Corpus asks specifically when participants started speaking English and Welsh. Age of onset of exposure and age of acquisition represent slightly different aspects of acquisition, predominately in that age of onset of exposure represents the initial stages of acquisition whereas age of acquisition represents a stage further on in the acquisition process, when at least some of the language has been acquired. Given this, an age of acquisition is a more accurate characterization of the Siarad Corpus data than age of onset of exposure, which was specifically queried for the grammaticality judgment data. Two variables were considered in determining age of acquisition – when the participant self reported learning Welsh and when the participant self reported learning English. Initially, participants were coded according to Table 17. Participants that indicated they had learned both Welsh and English since birth were automatically considered to be simultaneous bilinguals, as well as participants who indicated that they spoke one language since birth and the other from the age of 2 or younger. Early sequential bilinguals included participants who indicated speaking one language since birth and the other from the age of 4 or younger or primary school. Lastly, participants who reported speaking one language from birth and learning the other during secondary school or adulthood were categorized as late sequential bilinguals.

	English spoke since					
Welsh spoke since	*Since Birth*	*2 years or younger*	*4 years of younger*	*Since primary school*	*Since secondary school*	*Since adulthood*
Since birth	Simultaneous (N = 34)					
2 years or younger						
4 years of younger	Sequential (N = 98)					
Since primary school						
Since secondary school	Late Sequential (N = 16)					
Since adulthood						

Table 17 Breakdown of Criteria for Age of Acquisition

However, the presence of several outliers in the Early Sequential group prompted a reexamination of the survey. As the survey question specifically asks "When did you start speaking Welsh (or English)?", the simultaneous group was expanded to include any participant that reported speaking on language since birth and the other since birth, 2 years or younger, or 4 years and younger. The early sequential group was reduced to any participant that reported speaking one language since birth and the other since primary school, and the late sequential group remained the same, as shown in Table 19 on page 118.

In order to more accurately represent participants' patterns in bilingualism, the age of acquisition construct was augmented to include the L1 of the participants. This created five groups of participants, as shown in Table 18, and allowed for more detailed analysis of language use, particularly in the sub-sample study below.

Simultaneous	Early Sequential		Late Sequential	
	Welsh L1	English L1	Welsh L1	English L1
N = 61	N = 41	N = 8	N = 6	N = 6

Table 18 Participants according to Age of Acquisition and L1

<table>
<tr><td></td><td colspan="6">English spoke since</td></tr>
<tr><td>Welsh spoke since</td><td>Since Birth</td><td>2 years or younger</td><td>4 years of younger</td><td>Since primary school</td><td>Since secondary school</td><td>Since adulthood</td></tr>
<tr><td>Since birth</td><td colspan="3" rowspan="3">Simultaneous
(N = 61)</td><td rowspan="2"></td><td colspan="2" rowspan="2"></td></tr>
<tr><td>2 years or younger</td></tr>
<tr><td>4 years of younger</td><td rowspan="3">Early Sequential
(N = 49)</td></tr>
<tr><td>Since primary school</td><td colspan="3" rowspan="3"></td></tr>
<tr><td>Since secondary school</td><td rowspan="2">Late Sequential
(N = 12)</td></tr>
<tr><td>Since adulthood</td></tr>
</table>

Table 19 Amended Criteria for Age of Acquisition

Normed token means.

Tokens in the corpus were coded according to language, where there were four possible categories: English, Welsh, mixed, and undetermined. Mixed tokens predominantly included the *English verb+ Welsh –io* construction, such as *text-io*. Similarly, the *English verb+ Welsh –o* construction was also used, as in

erupt-o. One other possible mixed token construction occurred; however, it is only attested to twice in the corpus and is used by the same speaker. This construction can be characterized as *Welsh number + ish* and is best demonstrated by *saith-ish*, meaning *seven-ish*. Undetermined tokens, such as *so*, could not be ascribed to a particular language.

Normed token means were calculated for each participant, based on analysis of the transcripts using CLAN (MacWhinney, 2000). The token means were normed to 1000, and included means for Welsh tokens per 1000, English tokens per 1000, mixed tokens per 1000, undetermined tokens per 1000 and other tokens per 1000. Table 20 demonstrates the normed token means for a participant named Gwynn.

Gwyn (25 year old male from NW Wales)	
Total tokens	3828
Welsh	878.79 (per 1000)
English	31.61 (per 1000)
Mixed	1.31 (per 1000)

Table 20 Sample normed tokens per 1000

For the purposes of this study, analyses focused on the normed means for English tokens, mixed tokens, and undetermined tokens.

Normed means allow for a more precise description of a participant's language use, which leads to clearer comparisons of language use across participants. For this study, token means were normed to 1000 words, as the majority of participants data included between 1000 – 4000 words. In the case of

this study, norming the token means to 100 would not have adequately captured some language behaviors, such as the use of mixed Welsh-English tokens, while norming the token means to 10,000 could have led to Type 1 errors in the statistical analyses.

Descriptive statistics.

The descriptive statistics below refer to the two age of acquisition constructs. The data for the simultaneous bilinguals remain the same in both tables, as that group does not change across the constructs. However, Table 21 on the next page describes the normed token means for the general grouping described in Table 18 above, while Table 22 on page 121 shows the normed token means (standard deviations in parentheses) for age of acquisition according to L1, described in Table 19 above.

At this point, it is worth noting how normed token means are useful as measurements. Rather than exploring percentage of speech in English, the normed means provide a snapshot of how many tokens on average can be expected to be English (or mixed or undetermined) per 1000 words. The normed token means can be used in statistical tests of variance, as the unit of measurement (1000 words) remains constant across all means.

	Simultaneous (N = 61)	Early Sequential (N = 49)	Late Sequential (N = 12)
Mean English Tokens per 1000	46.8 (SD = 33.87)	26.2 (SD = 29.18)	21.8 (SD = 17.21)
Mean Mixed Tokens per 1000	2.3 (SD = 2.93)	1.0 (SD = 1.21)	0.6 (SD = 0.62)
Mean Undetermined Tokens per 1000	128.8 (SD = 38.21)	125.8 (SD = 38.81)	155.8 (SD = 48.63)

Table 21 Normed Token Means according to Age of Acquisition

	Simultaneous (N = 61)	Early Sequential		Late Sequential	
		Welsh L1 (N = 41)	English L1 (N = 8)	Welsh L1 (N = 6)	English L1 (N = 6)
Mean English Tokens per 1000	46.8 (SD = 33.87)	27.0 (SD = 30.94)	22.1 (SD = 18.58)	22.1 (SD = 22.38)	21.5 (SD = 12.26)
Mean Mixed Tokens per 1000	2.3 (SD = 2.93)	0.9 (SD = 1.19)	1.4 (SD = 1.33)	0.8 (SD = 0.73)	0.5 (SD = 0.49)
Mean Undetermined Tokens per 1000	128.8 (SD = 38.23)	126.8 (SD = 37.32)	120.7 (SD = 48.32)	143.3 (SD = 27.00)	168.2 (SD = 64.03)

Table 22 Normed Token Means according Age of Acquisition with L1

ANOVA Measure

While a chi square establishes an association between two factors, an Analysis of Variance (ANOVA) allows the investigation of within-groups variance and between-groups variance on continuous variables. Accounting for within-groups variance in CS addresses a methodological issue in CS research, namely that not all speakers are likely to switch in the same way. Discussion of the variance within and between groups not only quells some of the bickering about counterexamples, but also establishes a more powerful data set for analysis, since variance becomes more transparent. An ANOVA compares the means of each group to the grand mean of all groups and then calculates deviations from the grand mean in order to establish within-groups and between-groups variation. When the variance between groups is larger than within groups, then the variance becomes significant. However, an ANOVA is not an appropriate test for responses to grammaticality judgments and ranking tasks, since those responses are categorical rather than continuous.

The study of the Siarad Corpus employs an ANOVA, as the independent variable is age of onset of acquisition and each participant will fall into only one group. Additionally, the dependent variables are the number of English and mixed tokens per 1000, which are continuous variables. However, the ANOVA results will need to be interpreted with caution. Since participants will not be randomly assigned to the three categories of bilingualism, the independence assumption will most likely be violated, which can lead to a significant result that is not truly significant.

The ANOVA statistic is parametric and requires that certain other assumptions are also met. First, the data must come from a normally

distributed population, as evidenced through a normal distribution of the data. Secondly, an ANOVA assumes that homogeneity of variance exists, such that the variances are similar for each group, which can be tested using Levene's Test. As a parametric test, the ANOVA is also sensitive to extreme means.

Chapter Summary

This chapter presented the research questions, participants, and statistical analyses for both the primary study on the variance in grammaticality judgments of different groups of Slovak-English bilinguals and the secondary sub-study of variance in the naturalistic data in the Welsh-English Siarad corpus. Though the two studies investigate similar questions, the nature of the data requires different constructs and statistical analyses. The results of these analyses are presented in the following chapter.

Findings

This chapter presents the results from the Slovak-English grammaticality judgment study and the Welsh-English Siarad Corpus sub-study. Data from the Slovak-English study are presented first. For each category of Slovak-English switches discussed, a brief syntactic description of the switch will be presented, along with the accompanying chi square goodness of fit analysis, before focusing on differences in judgments according to the bilingual groups, as evidenced by the chi square test of independence analysis. Finally, data from the ANOVA analyses on the normed token means in the Siarad Corpus sub-study will be discussed. The implications of the results will be presented in Chapter Five.

Slovak-English Data

The data discussed below come from the 92 judgment tasks presented to the 39 Slovak English bilingual participants in this study. The data are organized according to the syntactic nature of the switch task. Nominative pronoun switches are discussed first, followed by tasks exploring word order, case, and the presence of English determiners. The section concludes with the discussion of tasks involving modal and progressive auxiliary switches. Each task is presented with a gloss of the switch and a brief syntactic description, before presenting the Chi Square goodness of fit analysis and the Chi Square test of independence analysis, along with the responses of the simultaneous bilinguals. In cases where a ranking task was also employed, the ranking task is presented after discussion of the two relevant grammaticality judgment tasks.

Nominative Pronouns

Switches involving nominative pronouns were presented as priming tasks. As van Gelderen and MacSwan (2008) indicates, switches between nominative pronouns and their verbal complements are generally banned as switching between a nominative pronoun and a verb forms a complex head which crashes at PF. However, participants in this study frequently found these types of switches acceptable, except when presented as part of a ranking task.

Ona* has decided to travel *domov.

(35) *Ona* has decided to travel *domov*

3.S.F has decided to travel home-LOC

'she has decided to travel home'

As with many switches in this section, the primary switch occurs in (35) occurs between the third person singular feminine pronoun, *ona*, and the verbal complement, *has decided to travel* ***domov***. In addition, a second switch occurs at the boundary of the adverbial complement, *domov*.

A one sample chi-square test was conducted on all 39 composite responses to determine whether one judgment was significantly preferred over the others, and the results were significant, χ^2 (2, N = 39) = 50.9, $p < .01$. The proportion of respondents who indicated that (35) was acceptable (P = 0.87) was much greater than the proportion of respondents who found the switch questionable (P = 0.05) or unacceptable (P = 0.08).

Further, the 2 x 3 chi square test of independence showed no significant relationship between type of bilingual and response to (35). The χ^2

value of 3.13 had an associated probability value of 0.21, DF = 2, Cramer's V = 0.29. However, the analysis showed that four cells had an expected count of less than 5. The proportion of responses within each group is shown in Table 23.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (p = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	13 (P = 1.00)	0 (P = 0.0)	0 (P = 0.0)
Late Sequential (N = 24)	19 (P = 0.79)	2 (P = 0.08)	3 (P = 0.12)

Table 23 Proportion of responses within groups to (35)

The simultaneous bilinguals both responded that (35) was acceptable, following the trend in both the early sequential and late sequential group.

She has decided to travel *domov.*

(36) She has decided to travel *domov*

she has decided to travel home-LOC

'she has decided to travel home'

In this complement task to (35), no switch occurs between the nominative pronoun and the verbal complement; however, the switch at the adverbial boundary, *domov*, is maintained, as in (35).

The results of the one sample chi-square test were significant, χ^2 (2, N = 39) = 61.1, $p < .01$, indicating that one judgment was significantly preferred over the others The proportion of respondents who indicated that (36) was acceptable (P = 0.92) was much greater than the proportion of respondents who found the switch questionable (P = 0.03) or unacceptable (P = 0.05), similar to the results from (35).

Again, as with (35), a 2 x 3 chi square test of independence indicated no significant relationship between bilingual group (N=37) and grammaticality judgment of (36). The χ^2 value of 2.93 had an associated probability value of $p = 0.23$, DF = 2, Cramer's V = 0.28. Given the number of respondents finding (36) acceptable, four cells had an expected frequency of less than 5. The proportions of responses within each bilingual group are shown in Table 24.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	12 (P = 0.92)	1 (P = 0.08)	0 (P = 0.0)
Late Sequential (N = 24)	22 (P = 0.92)	0 (P = 0.0)	2 (P = 0.08)

Table 24 Proportions of Responses within Groups to (36)

The simultaneous bilinguals both responded that (36) was acceptable, similar to the trend indicated by the early and late sequential groups.

Ranking task.

(35) *Ona* has decided to travel *dom-ov*

3.S.F has decided to travel home-LOC

'she has decided to travel home'

(36) She has decided to travel *dom-ov*

she has decided to travel home-LOC

'she has decided to travel home'

Switches (35) and (36) were also presented as part of a ranking task, asking participants to indicate whether one switch was preferable. Only one participant preferred (35) (2.5%), while 34 participants preferred (36) (85%). Four participants (10%) indicated that neither (35) nor (36) were preferable, and of these, only one had a negative attitude towards CS. The one sample chi-square test conducted to determine whether one switch was significantly preferred over the others yielded significant results, χ^2 (2, N = 39) = 51.2, $p <$ .01. The proportion of respondents who preferred (36) (P = 0.87) was much greater than the proportion of respondents who preferred (35) (P = 0.03) or neither (P = 0.10)

The chi square test for independence indicated that there was no significant difference in how the early sequential and late sequential groups responded (χ^2 (1, N = 37) = 1. 77, p = 0.18, Cramer's V = 0.22). Given that 50% of the cells had an expected count of less than five, a Fisher's Exact Test

was conducted, yielding $p = 0.54$. The proportion of respondents for each preference is shown in Table 25 below.

All early sequential bilinguals preferred (36) over (35) (N = 13), while only 21 late sequential bilinguals preferred (36) (N = 21). The remaining three late sequential bilinguals preferred neither switch. Of the two simultaneous bilinguals, one preferred (35), while the other preferred neither.

	Ona* has decided to travel *domov	**She has decided to travel *domov***	**Neither**
Simultaneous (N = 2)	1 (P = 0.50)	0 (P = 0.0)	1 (P = 0.50)
Early Sequential (N = 13)	0 (P = 0.0)	13 (P = 1.00)	0 (P = 0.0)
Late Sequential (N = 24)	0 (P = 0.0)	21 (P = 0.87)	3 (P = 0.13)

Table 25 Preferences within Groups for (35) and (36)

The fox was wild, but it *jedla z mojej ruky*.

(37) The fox was wild, but it *jedl-a* *z* *moj-ej*
the fox was wild, but it eat-PST.F from my-GEN.F
ruk-y
hand-GEN.F
'the fox was wild, but it ate out of my hand'

In (37), the pronominal switch is embedded in a larger complementizer clause, and involves a switch between the English third person singular nominative pronoun, *it*, and the Slovak verbal complement, *jedla z mojej ruky*.

Results from the one sample chi-square test conducted to determine whether one judgment was significantly preferred over others were nonsignificant, χ^2 (2, N = 39) = 4.31, p = 0.12. A follow-up test indicated that there was not a significant preference for acceptable over unacceptable, χ^2 (1, N = 32) = 0.13, p = 0.72. The proportion of respondents who indicated that (37) was acceptable (P = 0.44) was not significantly different to the proportion of respondents who found the switch questionable (P = 0.18) or unacceptable (P = 0.38).

The 2 x 3 chi square test of independence exploring the relationship between type of bilingual and judgment produced a value of 5.49 with an associated probability value approaching significance (p = .064, DF = 2, Cramer's V = 0.39). However, two cells had an expected frequency of less than 5, indicating that the significance of results may be unreliable. Despite this, it is clear that a larger portion of late bilinguals found (37) unacceptable. The proportion of responses in for each bilingual group is given in Table 26.

	Acceptable	Questionable	Unacceptable
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	7 (P = 0.53)	4 (P = 0.30)	2 (P = 0.15)
Late Sequential (N = 24)	8 (P = 0.33)	3 (P = 0.12)	13 (P = 0.54)

Table 26 Proportions of Responses within Groups to (37)

The simultaneous bilinguals both responded that (37) was acceptable, following the trend of the early sequential group.

The fox was wild, but *jedla z mojej ruky.*

(38) The fox was wild, but Ø *jedl-a* *z* *moj-ej*
the fox was wild, but pro eat-PST.F from my-GEN.F
ruk-y
hand-GEN.F
'the fox was wild, but it ate out of my hand'

In contrast to previous switch tasks, (38) presented a switch involving a third person null subject pronoun. The switch occurs between the English complementizer, *but*, and the Slovak tense phrase, *Ø jedla za mojej ruky*. This differs from (37), where the switch occurs between the English subject pronoun and the Slovak verbal compliment.

The one sample chi-square test conducted to determine whether one judgment was significantly preferred over the others yielded significant results, χ^2 (2, N = 39) = 56.0, $p < .01$. The proportion of respondents who indicated that (38) was acceptable (P = 0.90) was much greater than the proportion of respondents who found the switch questionable (P = 0.03) or unacceptable (P = 0.08). In contrast to (37) above, the 2 x 3 chi square determining the relationship between type of bilingual and judgment for (38) had a value of 3.49, with an associated probability of 0.17 (DF = 2, Cramer's V = 0.31), indicating nonsignificance. Table 27 on the next page displays the proportion of responses within each group. Following the trend in the early and late sequential groups, the simultaneous bilinguals both responded that (38) was acceptable.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	12 (P = 0.92)	1 (P = 0.08)	0 (P = 0.0)
Late Sequential (N = 24)	21 (P = 0.87)	0 (P = 0.0)	3 (P = 0.13)

Table 27 Proportions of Responses within Groups to (38)

Ranking task.

(37) The fox was wild, but it *jedl-a* *z* *moj-ej*

the fox was wild, but it eat-PST.F from POSS.1S-F.GEN

ruk-y

hand-F.S.GEN

'the fox was wild, but it ate out of my hand'

(38) The fox was wild, but *jedl-a* *z*

the fox was wild, but pro eat-PST.F from

moj-ej *ruk-y*

POSS.1S-F.S.GEN hand- F.S.GEN

'the fox was wild, but it ate out of my hand'

Switches (37) and (38) were also presented as a ranking task, asking participants to indicate whether one switch was preferable. 36 participants preferred (38) over (37) (90%), while 3 preferred neither (7.5%). Of those who preferred neither, none indicated a negative attitude towards CS. None of the participants preferred (37). A one sample chi-square test conducted to determine whether one switch was significantly preferred over the others yielded significant results, χ^2 (1, N = 39) = 27.9, $p < .01$. The proportion of respondents who preferred (38) (P = 0.92) was much greater than the proportion of respondents who preferred neither (P = 0.08), while no participants preferred (37).

The chi square test of independence measuring the relationship between the bilingual group and grammaticality judgment yielded

nonsignificant results, χ^2 (1, N = 37) = 1.77. As two cells in the chi square had less than the expected count, Fisher's exact probability gave a value of 0.54 for a two-tailed hypothesis, Cramer's V = 0.22. The proportions of participants within each group preferring (37) or (38) are shown in Table 28.

All 13 early sequential bilinguals preferred (38), as well as 21 late sequential bilinguals. Three late sequential bilinguals preferred neither, while both simultaneous bilinguals preferred (38).

	The fox was wild, but it *jedla z mojej ruky*	**The fox was wild, but *jedla z mojej ruky***	**Neither**
Simultaneous (N = 2)	0 (P = 0.0)	2 (P = 1.0)	0 (P = 0.0)
Early Sequential (N = 13)	0 (P = 0.0)	13 (P = 1.00)	0 (P = 0.0)
Late Sequential (N = 24)	0 (P = 0.0)	21 (P = 0.87)	3 (P = 0.13)

Table 28 Preferences within Groups for (37) and (38)

We *sme chceli pozerat'* Champions League.

(39) We *sme* *chce-l-i* *pozer-at'* Champions League
we AUX.1.PL want-PST-PL watch-INF Champions League
'we wanted to watch Champions League'

The switch presented in (39) occurs between the English nominative pronoun *we* and the Slovak verbal complement *sme chceli pozerat'*. In addition, a second switch, *Champions League*, occurs in the accusative complement of *sme chceli pozerat'*, though this switch is not the primary switch of interest in this task.

A one sample chi-square test conducted to determine whether one judgment was significantly preferred over the others yielded significant results, χ^2 (2, N = 39) = 34.3, $p < .01$. The proportion of respondents who indicated that (39) was acceptable (P = 0.77) was significantly greater than the proportion of respondents who found the switch questionable (P = 0.05) or unacceptable (P = 0.18), according to a follow-up test, χ^2 (1, N = 37) = 14.3, $p < .01$.

The results of the 2 x 3 chi square test of independence for (39) were nonsignificant, $\chi 2$ (2, N = 37) = 3.15, $p = 0.21$, Cramer's V = 0.29. The proportion of early sequential bilinguals indicating that (39) was acceptable was higher than that of the late sequential bilinguals; however, six late bilinguals found (39) unacceptable, while only one early sequential bilingual did. A further two late sequential bilinguals found (39) questionable. The proportions of responses within groups are given in Table 29. Following the trend in the early and late sequential bilinguals, both simultaneous bilinguals responded that (39) was acceptable.

	Acceptable	Questionable	Unacceptable
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	12 (P = 0.92)	0 (P = 0.0)	1 (P = 0.08)
Late Sequential (N = 24)	16 (P = 0.67)	2 (P = 0.08)	6 (P = 0.25)

Table 29 Proportions of Responses within Groups to (39)

I *mám rada* beans on toast.

(40) I *má-m* *rad-a* beans on toast

I have-1.S glad-S.F beans on toast

'I like beans on toast'

The switch in (40) occurs initially between the English first person singular pronoun, *I*, and the Slovak verb phrase, *mám rada*. However, a second switch also occurs in the English complement *beans on toast*.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others, yielding significant results, χ^2 (2, N = 39) = 20.5, $p < .01$. The proportion of respondents who indicated that (40) was acceptable (P = 0.67) was much greater than the proportion of respondents who found the switch questionable (P = 0.10) or unacceptable (P = 0.23).

As a result of the overall preference for the acceptability of (39), the results of the 2 x 3 chi square test of independence were not significant, χ^2 (2, N = 37) = 1. 29, p = 0.53, Cramer's V = 0.19. The proportion of responses within each group is given in Table 30.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	10 (P = 0.77)	1 (P = 0.08)	2 (P = 0.15)
Late Sequential (N = 24)	14 (P = 0.58)	3 (P = 0.13)	7 (P = 0.29)

Table 30 Proportions of Responses within Groups to (40)

The simultaneous bilinguals also both responded that (39) was acceptable, mirroring the trend among the early and late sequential bilinguals.

***Mám rada* beans on toast**.

(41) Ø *má-m* *rad-a* beans on toast

pro have-1.S glad-S.F beans on toast

'I like beans on toast'

In contrast to the other switches in this section, (41) does not present a switch between a nominative pronoun and its verbal complement. In this case, the switch is entirely contained in the accusative complement *beans on toast*. However, (41) was presented as a judgment task in order to consistently

present all switches before presenting them comparatively in a ranking task.

A one sample chi-square test conducted to determine whether one judgment was significantly preferred over the others yielded significant results, χ^2 (1, N = 39) = 27.9, $p < .01$. The proportion of respondents who indicated that (41) was acceptable (P = 0.92) was much greater than the proportion of respondents who found the switch questionable (P = 0.08). None of the participants found this switch unacceptable.

However, the chi square test of independence of (41) produced nonsignificant results (χ^2 (2, N = 37) = 1. 90, $p = 0.39$, Cramer's V = 0.01). Given that 50% of the cells had an expected count of less than five, a Fisher's Exact Test was conducted, yielding $p = 1.00$, indicating almost no relationship between bilingual group and grammaticality judgment. Table 31 shows the proportion of responses across bilingual groups.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	11 (P = 0.85)	1 (P = 0.08)	1 (P = 0.08)
Late Sequential (N = 24)	22 (P = 0.92)	0 (P = 0.0)	2 (P = 0.08)

Table 31 Proportions of Responses within Groups to (41)

Following the pattern in both the early and late sequential bilingual groups, the simultaneous bilinguals both responded that (41) was acceptable.

Ranking task.

(40) I *má-m* *rad-a* beans on toast
I have-1.S glad-F beans on toast
'I like beans on toast'

(41) *Ø* *Má-m* *rad-a* beans on toast
pro have-1.S glad-F beans on toast
'I like beans on toast'

Participants were also asked to rank (40) and (41) in terms of preferred switch. 38 participants preferred (41) over (40) (95%), while only one preferred (41) (2.5%). The one sample chi-square test was conducted to determine whether one switch was significantly preferred over the others yielded significant results, χ^2 (1, N = 39) = 35.1, $p < .01$. The proportion of respondents who preferred (41) (P = 0.97) was much greater than the proportion of respondents who preferred (40) (P = 0.03). No participants indicated a preference for neither.

Among the early and late sequential bilingual groups, a χ^2 analysis of independence (N = 37, DF = 1, Cramer's V = 0.23) indicated that two cells had an expected count of less than five. A Fishers exact probability was conducted, yielding $p = 0.35$ for a two-tailed hypothesis, indicating nonsignificance. The proportions of participants within each group preferring either (40) or (41) are shown in Table 32. Both groups significantly preferred

(41), indicated by 12 of the early sequential bilinguals and 24 of the late sequential bilinguals. One early sequential bilingual preferred (40).

	I *mám rada* beans on toast	**Mám rada beans on toast**	**Neither**
Simultaneous (N = 2)	0 (P = 0.0)	2 (P = 1.0)	0 (P = 0.0)
Early Sequential (N = 13)	1 (P = 0.08)	12 (P = 0.92)	0 (P = 0.0)
Late Sequential (N = 24)	0 (P = 0.0)	24 (P = 1.0)	0 (P = 0.0)

Table 32 Preferences within Groups for (40) and (41)

Both simultaneous bilinguals preferred (41), following the general trend among the participants.

Word Order

Judgment tasks presented in this section queried participant preferences about word order in Slovak-English code switches. Slovak has more variability in word order than English, though the base word order for both languages is SVO. Responses to tasks investigating interrogative word order, along with SVO, SOV, and VOS are discussed in detail below.

***Uhrýzol t'a* the dog?.**

(42) *Uhrýz-ol-Ø* *t'a* the dog

bite-PST-M.S 2.S.ACC the dog

'did the dog bite you?

The word order presented in (42) reflects the typical interrogative VOS word order for Slovak, which contrasts with the VSO interrogative word order preferred in English. In (42), the switch occurs between the nominative English noun phrase *the dog* and the Slovak verb phrase *uhrýzol t'a*; however, the verb phrase has been fronted to accommodate interrogative word order in Slovak.

The one sample chi-square test conducted to determine whether one judgment was significantly preferred over the others yielded significant results, χ^2 (2, N = 39) = 23.2, $p < .01$. Follow-up tests showed that the proportion of respondents who indicated that (42) was acceptable (P = 0.69) was much greater than the proportion of respondents who found the switch questionable (P = 0.10), χ^2 (1, N = 31) = 17.1, $p < .01$, or unacceptable (P = 0.21), χ^2 (1, N = 35) = 10.3, $p < .01$.

As a result of the general acceptability of (42), the 2 x 3 chi square test of independence was nonsignificant, χ^2 (2, N = 37) = 3.37, $p = 0.19$, Cramer's V = 0.30. In addition, three cells had an expected count of less than five. The proportion of responses in each group is shown in Table 33. Following the trend in the early and late sequential groups, the simultaneous bilinguals both responded that (42) was acceptable.

	Acceptable	Questionable	Unacceptable
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	7 (P = 0.54)	3 (P = 0.23)	3 (P = 0.23)
Late Sequential (N = 24)	18 (P = 0.75)	1 (P = 0.04)	5 (P = 0.21)

Table 33 Proportions of Responses within Groups to (42)

The cat *poškrabala ho na nohe.*

(43) The cat *poškrab-al-a ho na noh-e*

the cat scratch-PST.F 3.M.ACC on leg-F.S.LOC

'the cat scratched him on the leg'

The word order in (43) represents the declarative SVO word order found in both Slovak and English. The switch occurs immediately after the nominative determiner phrase, *the cat*, and no elements have been fronted.

The one sample chi-square test conducted to determine whether one judgment was significantly preferred over the others yielded significant results, χ^2 (2, N = 39) = 8.8, p = .01. Follow-up tests indicated that the proportion of respondents who indicated that (43) was unacceptable (P = 0.54) was significantly greater than the proportion of respondents who found the switch questionable (P = 0.15), χ^2 (1, N = 27) = 8.3, p < .01, but not

significantly larger than the respondents who indicated that (43) was acceptable (P = 0.31), χ^2 (1, N = 33) = 2.5, p = .12.

A 2 x 3 chi square test of independence indicated a χ^2 of 3.90 (N = 37, DF = 2, Cramer's V = 0.33), with an associated probability of 0.14. Further, three cells had an expected frequency of less than five. Table 34 displays the proportion of responses across groups. The simultaneous bilinguals both responded that (43) was acceptable, which does not follow the pattern of the negative late sequential bilingual group's response or the mixed early sequential bilingual group's response.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	6 (P = 0.46)	2 (P = 0.15)	5 (P = 0.39)
Late Sequential (N = 24)	4 (P = 0.17)	4 (P = 0.17)	16 (P = 0.66)

Table 34 Proportions of Responses within Groups to (43)

The cat *ho poškrabala na nohe.*

(44) The cat *ho* *poškrab-al-a* *na* *noh-e*

the cat 3.M.ACC scratch-PST.F on leg-F.S.LOC

'the cat scratched him on the leg'

In contrast to (43), (44) presents the same switch with SOV order, which is also a common Slovak declarative word order.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others. The results were significant, χ^2 (2, N = 39) = 51.2, $p < .01$. The proportion of respondents who indicated that (44) was acceptable (P = 0.87) was much greater than the proportion of respondents who found the switch questionable (P = 0.03) or unacceptable (P = 0.10).

The 2 x 3 chi square test of independence of responses regarding the acceptance of (44) indicated a χ^2 of 3.13 (N = 37, DF = 2, Cramer's V = 0.29), with a nonsignificant associated probability of 0.21. In this case, four cells had an expected count of less than five. Proportions of responses across bilingual groups are displayed in Table 35.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	13 (P = 1.00)	0 (P = 0.0)	0 (P = 0.0)
Late Sequential (N = 24)	19 (P = 0.79)	1 (P = 0.04)	4 (P = 0.17)

Table 35 Proportions of Responses within Groups to (44)

The simultaneous bilinguals both responded that (44) was acceptable, which follows the trend of both the early sequential and late sequential groups.

Poškrabala ho* the cat *na nohe.

(45) *Poškrab-a-la* *ho* the cat *na noh-e*

scratch-PST.F 3.M.ACC the cat on leg-F.S.LOC

'the cat scratched him on the leg'

The switch presented in (45) offers another possible declarative word order in Slovak, where the VOS order is derived by fronting the past participle and accusative pronoun and leaving the locative adverbial phrase in situ.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others. The results of this test approached significance, χ^2 (2, N = 39) = 5.7, p = .06. The proportion of respondents who indicated that (45) was unacceptable (P = 0.44) was not significantly greater than the proportion of respondents who found the switch acceptable (P = 0.41), χ^2 (1, N = 33) = 0.03, p = .86. A smaller proportion of participants found the switch questionable (P = 0.15).

Further, the 2 x 3 chi square test of independence for (45) showed a χ^2value of 0.07 (N = 37, DF = 2, Cramer's V = 0.04), with a nonsignficant associated probability of 0.97. In this case, only two cells had an expected frequency of less than five. Table 36 displays the proportion of responses across groups. One simultaneous bilingual reported that this was unacceptable, while the other found (45) acceptable, which follows the trends in both the early sequential and late sequential groups.

	Acceptable	Questionable	Unacceptable
Simultaneous (N = 2)	1 (P = 0.50)	0 (P = 0.0)	1 (P = 0.50)
Early Sequential (N = 13)	5 (P = 0.39)	2 (P = 0.15)	6 (P = 0.46)
Late Sequential (N = 24)	10 (P = 0.42)	4 (P = 0.16)	10 (P = 0.42)

Table 36 Proportions of Responses within Groups to (45)

Ranking task.

(43) The cat *poškrabala ho na noh-e*

the cat scratch-PST.F 3.M.ACC on leg-F.S.LOC

'the cat scratched him on the leg'

(44) The cat *ho poškrab-al-a na noh-e*

the cat 3.M.ACC scratch-PST.F on leg-F.S.LOC

'the cat scratched him on the leg'

Participants were asked to indicate whether they preferred (43) or (44). 34 participants preferred (44) (85%), while two preferred (43) (5%). Three participants preferred neither (44) nor (43) (7.5%), and none of these indicated a negative attitude towards CS. A one sample chi-square test was conducted to determine whether one switch was significantly preferred over the others. The results were significant, χ^2 (1, N = 39) = 51.0, $p < .01$. The proportion of

respondents who preferred (44) (P = 0.87) was much greater than the proportion of respondents who preferred (43) (P = 0.05) or neither (P = 0.08).

The 2 x 3 chi square test of independence was nonsignificant, χ^2 (2, N = 37) = 3.49, p = 0.17, Cramer's V = 0.31. Four cells had an expected count of less than five. The proportions of participants within each group preferring (43) or (44) are shown in Table 37.

	The cat *poškrabala ho na nohe*	**The cat *ho poškrabala na nohe***	**Neither**
Simultaneous (N = 2)	1 (P = 0.50)	1 (P = 0.50)	0 (P = 0.0)
Early Sequential (N = 13)	1 (P = 0.08)	12 (P = 0.92)	0 (P = 0.0)
Late Sequential (N = 24)	0 (P = 0.0)	21 (P = 0.87)	3 (P = 0.13)

Table 37 Preferences within Groups for (43) and (44)

12 of the early sequential bilinguals preferred (44), as did 21 late sequential bilinguals. However, one early sequential bilingual preferred (43), while three late sequential bilinguals preferred neither. Of the two simultaneous bilinguals, one preferred (44) while the other preferred (43).

Case

The switches discussed in this section all involve case assignment. As discussed in Chapter 2, Slovak has a well developed case system comprised of six cases. In addition, case is marked on nouns, pronouns, and adjectives. The tasks below specifically explore the acceptability of case-marked Slovak noun phrases in English determiner phrases and unmarked English determiner phrases in case-receiving positions in Slovak verb phrases. In addition, the grammaticality of case-marked Slovak prepositional phrases within English verb phrases is also surveyed.

What's so important about a *rybu*?.

(46) What's so important about a *ryb-u*?

what's so important about a fish-F.ACC

'what's so important about a fish'

The switch presented in (46) involves an accusative prepositional phrase where the indefinite English article, *a*, does not carry case agreement, but the Slovak noun phrase, *rybu*, is marked for feminine accusative agreement.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others. The results were significant, χ^2 (2, N = 39) = 42.0, $p < .01$. The proportion of respondents who indicated that (46) was unacceptable (P = 0.82) was much greater than the proportion of respondents who found the switch questionable (P = 0.05) or acceptable (P = 0.13).

The subsequent 2 x 3 chi square test of independence produced a χ^2value of 0.94 with an associated probability value that was nonsignificant (p = 0.63, DF = 2, Cramer's V = 0.16), but four cells had an expected frequency of less than five. The proportion of responses for each bilingual group is given in Table 38.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	1 (P = 0.50)	0 (P = 0.0)	1 (P = 0.50)
Early Sequential (N = 13)	2 (P = 0.15)	0 (P = 0.0)	11 (P = 0.85)
Late Sequential (N = 24)	2 (P = 0.08)	1 (P = 0.04)	21 (P = 0.88)

Table 38 Proportions of Responses within Groups to (46)

One simultaneous bilingual found (46) acceptable, while the other found it unacceptable, which does not follow the general trend among the early and late sequential bilinguals.

What's so important about a *ryba*?.

(47) What's so important about a *ryb-a*?

what's so important about a fish-F.NOM

'what's so important about a fish'

In contrast to (46), (47) presented the same switch; however, the Slovak noun phrase, *ryba*, carried the feminine accusative case marker, which would have been ungrammatical in a monolingual Slovak context.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others. The results were significant, χ^2 (2, N = 39) = 16.8, $p < .01$. Further follow-up tests showed that the proportion of respondents who indicated that (47) was acceptable (P = 0.51) was much greater than the proportion of respondents who found the switch questionable (P = 0.03), χ^2 (1, N = 21) = 17.2, $p < .01$, but not significantly greater than the proportion of respondents who found the switch unacceptable (P = 0.46), χ^2 (1, N = 38) = 0.12, $p = .75$.

In comparison to (46), a 2 x 3 chi square test of independence of responses to the acceptance of (47) indicated a χ^2 of 10.43 (N = 37, DF = 2, Cramer's V = 0.53), with an associated probability of 0.001, showing a significant association between bilingual group and acceptability of (47). However, two cells had an expected frequency of less than five. Proportions of responses across bilingual groups are displayed in Table 39. Similar to the majority of the early sequential bilinguals, the simultaneous bilinguals both responded that (47) was acceptable.

	Acceptable	Questionable	Unacceptable
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	11 (P = 0.85)	0 (P = 0.0)	2 (P = 0.15)
Late Sequential (N = 24)	7 (P = 0.29)	1 (P = 0.04)	16 (P = 0.67)

Table 39 Proportions of Responses within Groups to (47)

Ranking task.

(46) What's so important about a *ryb-u*?

what's so important about a fish-F.ACC

'what's so important about a fish'

(47) What's so important about a *ryb-a*?

what's so important about a fish-F.NOM

'what's so important about a fish'

Participants were also asked to indicate whether they preferred (46) or (47). One participant preferred (46) over (47) (2.5%), while 23 participants preferred (47) (57.5%). 14 participants (35%) preferred neither switch, including one participant who indicated a negative attitude toward CS. A one sample chi-square test was conducted to determine whether one switch was

significantly preferred over the others. The results were significant, χ^2 (1, N = 39) = 19.3, $p < .01$. Follow-up tests showed that the proportion of respondents who preferred (47) (P = 0.59) was much greater than the proportion of respondents who preferred (46) (P = 0.03), but not significantly greater that the proportion of respondents who preferred neither (P = .36).

The 2 x 3 chi square test of independence of the two bilingual groups yielded a value of 4.73 (N = 36, DF = 1, Cramer's V = 0.36), with an associated probability of 0.03, indicating significance. The proportions of participants within each group preferring (46) or (47) are shown in Table 40.

	What's so important about a *rybu*?	**What's so important about a *ryba*?**	**Neither**
Simultaneous (N = 2)	1 (P = 0.50)	1 (P = 0.50)	0 (P = 0.0)
Early Sequential (N = 13)	0 (P = 0.0)	11 (P = 0.85)	2 (P = 0.15)
Late Sequential (N = 24)	0 (P = 0.0)	11 (P = 0.48)	12 (P = 0.52)

Table 40 Preferences within Groups for (46) and (47)

While 11 early sequential bilinguals and 11 late sequential bilinguals preferred (47), two early sequential bilinguals and 12 late sequential bilinguals preferred

neither. Of the two simultaneous bilinguals, one preferred (46) while the other preferred (47). Data from one participant was missing.

Yesterday I went *autobusom*, but today I took the train.

(48) Yesterday I went *autobus-om*, but today I took the train

Yesterday I went autobus-M.INS but today I took the train

'Yesterday I went by bus, but today I took the train'

Specific adverbial contexts in Slovak can also license case, which must be marked in the accompanying noun phrase. In (48), a switch occurs within the English verb phrase where the Slovak adverbial phrase, *autobusom*, is marked for instrumental case.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others, which yielded significant results, χ^2 (2, N = 39) = 42.6, $p < .01$. The proportion of respondents who indicated that (48) was acceptable (P = 0.82) was much greater than the proportion of respondents who found the switch questionable (P = 0.03) or unacceptable (P = 0.15).

A 2 x 3 chi square test of independence indicated a χ^2 value of 4.68 (N = 37, DF = 2, Cramer's V = 0.36), with a nonsignificant associated probability of 0.10. As with previous analyses, four cells had an expected frequency of less than five. Table 41 displays the proportion of responses across groups. The simultaneous bilinguals both responded that (48) was acceptable, mirroring the general trend among both the early sequential and late sequential bilingual groups.

	Acceptable	Questionable	Unacceptable
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	13 (P = 1.00)	0 (P = 0.0)	0 (P = 0.0)
Late Sequential (N = 24)	17 (P = 0.71)	1 (P = 0.04)	6 (P = 0.25)

Table 41 Proportions of Responses within Groups to (48)

I took the *psa na prechádzku*.

(49) I took the *ps-a* *na* *prechádzk-u*

I took the dog-M.ACC on walk-F.ACC

'I took the dog for a walk'

The switch boundary presented in (49) occurs between an English definite determiner and the Slovak noun, *pes*, in an accusative context. *Psa* carries the accusative agreement marker for animate masculine nouns in Slovak, while the English determiner does not carry any agreement features for gender or case.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others. The results were significant, χ^2 (2, N = 39) = 26.5, $p < .01$. Follow-up tests indicated that the proportion of respondents who found (49) acceptable (P = 0.69) was much

greater than the proportion of respondents who found the switch questionable (P = 0.03), χ^2 (1, N = 28) = 24.1, $p < .01$, or unacceptable (P = 0.28), χ^2 (1, N = 38) = 6.7, $p < .01$.

The 2 x 3 chi square test of independence (N = 37) yielded a χ^2 value of 3.49 with an associated probability value of $p = .017$ (DF = 2, Cramer's V = 0.31), though

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	10 (P = 0.77)	1 (P = 0.8)	2 (P = 0.15)
Late Sequential (N = 24)	15 (P = 0.63)	0 (P = 0.0)	9 (P = 0.38)

Table 42 Proportions of Responses within Groups to (49)

three cells had an expected count of less than five. The proportion of responses for each bilingual group is given in Table 42. The simultaneous bilinguals both responded that (49) was acceptable, in contrast to the variability present in the late sequential bilingual group.

Videl som* the American bloke *včera na omši.

(50) Ø *vid-el* *som* the American bloke *včera*

pro see-PST.M AUX.1.S the American bloke yesterday

na *omš-i*

at mass-F.DAT

'I saw the American bloke at mass yesterday'

In contrast to (49), (50) presents a context where the English determiner phrase, *the American bloke*, occurs in an accusative position. As case is not overtly marked on the determine phrase itself, (50) queried the acceptability of an English determiner phrase within a Slovak verb phrase.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others. The results were significant, χ^2 (2, N = 39) = 30.2, $p < .01$. The proportion of respondents who indicated that (50) was acceptable (P = 0.74) was much greater than the proportion of respondents who found the switch questionable (P = 0.08) or unacceptable (P = 0.18).

The 2 x 3 chi square test of independence produced a χ^2 value of 0.23 (N = 37, DF = 2, Cramer's V = 0.08), with a nonsignificant associated probability of 0.89. However, four cells had an expected frequency of less than five. Table 43 displays the proportion of responses across groups. The simultaneous bilinguals both responded that (50) was acceptable, following the general trend across the early and late sequential bilingual groups.

	Acceptable	Questionable	Unacceptable
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	9 (P = 0.69)	1 (P = 0.8)	3 (P = 0.23)
Late Sequential (N = 24)	18 (P = 0.75)	2 (P = 0.08)	4 (P = 0.17)

Table 43 Proportions of Responses within Groups to (50)

Musel som krmit' **my neighbor's fish** ***cez víkend.***

(51) *Mus-el-Ø* *som* *krm-it'* my neighbor's fish

must-PST-M AUX.1.S feed-INF my neighbor's fish

cez *víkend-Ø*

through weekend-M.ACC

'I had to feed my neighbor's fish over the weekend'

As a follow-up to (50), (51) presents a switch where an English determiner phrase occurs in an accusative position which would normally be case-marked in Slovak.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others. The results were significant, χ^2 (2, N = 39) = 51.0, $p < .01$. The proportion of respondents who indicated that (51) was acceptable (P = 0.87) was much greater than the

proportion of respondents who found the switch questionable (P = 0.05) or unacceptable (P = 0.08).

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	13 (P = 1.00)	0 (P = 0.0)	0 (P = 0.0)
Late Sequential (N = 24)	19 (P = 0.79)	2 (P = 0.08)	3 (P = 0.13)

Table 44 Proportions of Responses within Groups to (51)

The 2 x 3 chi square test of independence for (51) was also nonsignificant, χ^2 (2, N = 37) = 3.13, p = 0.21, Cramer's V = 0.29. As with other analyses, four cells had an expected frequency of less than five. The proportion of responses in each group is shown in Table 44. Following the overall trend, the simultaneous bilinguals both responded that (51) was acceptable.

***Čo by si chcel* for breakfast?.**

(52) *Čo by si chce-l-Ø* for breakfast?

what COND AUX.2.S want-PST-S.M for breakfast

'what would you like for breakfast?'

In (52), the English prepositional phrase, *for breakfast*, occurs in an otherwise Slovak conditional interrogative.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others, which yielded significant results, χ^2 (1, N = 39) = 35.1, $p < .01$. The proportion of respondents who indicated that (52) was acceptable (P = 0.97) was much greater than the proportion of respondents who found the switch questionable (P = 0.03). No participants found the switch unacceptable.

The chi square test of independence for (52) indicated that there was no significant relationship between response and bilingual group, χ^2 (1, N = 37) = 0.56, $p = 0.46$, Cramer's V = 0.12. Given that 50% of the cells had an expected frequency of less than 5, the Fisher's Exact Probability was conducted, indicating $p = 1.00$. The proportion of responses in each group is shown in Table 45.

	Acceptable	**Questionable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)
Early Sequential (N = 13)	13 (P = 1.00)	0 (P = 0.0)
Late Sequential (N = 24)	23 (P = 0.96)	1 (P = 0.04)

Table 45 Proportions of Responses within Groups to (52)

The simultaneous bilinguals both responded that (52) was acceptable, reflecting the trend in both the early sequential and late sequential bilingual groups.

***Čo by si chcel na* breakfast?**.

(53) *Čo* *by* *si* *chcel* *na* breakfast

what COND AUX.2.S want-PST-S.M for breakfast

'what would you like for breakfast?'

In contrast to (52), (53) presents a conditional interrogative clause where the switch occurs within the prepositional phrase. The English noun phrase, *breakfast*, occurs as the compliment of the Slovak preposition, *na*, which assigns accusative case in this usage. However, *breakfast* is not marked with any overt case agreement.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others. The results were significant, χ^2 (2, N = 39) = 51.0, $p < .01$. The proportion of respondents who indicated that (53) was acceptable (P = 0.87) was much greater than the proportion of respondents who found the switch questionable (P = 0.05) or unacceptable (P = 0.08).

The 2 x 3 chi square test of independence for (53) was nonsignificant, χ^2 (2, N = 37) = 1.90, $p = 0.38$, Cramer's V = 0.23. In addition, four cells had an expected frequency of less than five. The proportion of responses in each group is shown in Table 46. The simultaneous bilinguals both responded that (53) was acceptable, following the trend in the early sequential bilingual group.

	Acceptable	Questionable	Unacceptable
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	12 (P = 0.92)	1 (P = 0.08)	0 (P = 0.0)
Late Sequential (N = 24)	20 (P = 0.83)	1 (P = 0.4)	3 (P = 0.13)

Table 46 Proportions of Responses within Groups to (53)

***Čo by si chcel na* breakfast today?.**

(54) *Čo by si chce-l-Ø na* breakfast today

what COND AUX.2.S want-PST-S.M for breakfast today

'what would you like for breakfast today?'

The conditions in (54) are the same as in (53), with the exception of the addition of the English adverbial, *today*.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others. The results were significant, χ^2 (2, N = 39) = 56.0, $p < .01$. The proportion of respondents who indicated that (54) was acceptable (P = 0.90) was much greater than the proportion of respondents who found the switch questionable (P = 0.03) or unacceptable (P = 0.08).

Similarly to (53), the 2 x 3 chi square test of independence for (54) was nonsignificant, χ^2 (2, N = 37) = 2.43, p = 0.30, Cramer's V = 0.26. Four cells had an expected count of less than five. The proportion of responses in each group is shown in Table 47. As in (53), both simultaneous bilinguals responded that (54) was acceptable.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	13 (P = 1.00)	0 (P = 0.0)	0 (P = 0.0)
Late Sequential (N = 24)	20 (P = 0.83)	1 (P = 0.04)	3 (P = 0.13)

Table 47 Proportions of Responses within Groups to (54)

Ranking task.

(52) *Čo by si chce-l-Ø* for breakfast

what COND AUX.2.S want-PST-S.M for breakfast

'what would you like for breakfast?'

(53) *Čo by si chcel na* breakfast

what COND AUX.2.S want-PST-S.M for breakfast

'what would you like for breakfast?'

Finally, participants were asked to indicate a preference for either (52) or (53). In this case, 21 participants preferred (52) (52.5%), while 16 preferred (53) (40%). Only one participant preferred neither switch, and this participant did not indicate a negative attitude towards CS. Data from one participant was missing.

A one sample chi-square test was conducted to determine whether one switch was significantly preferred over the others. The results were significant, χ^2 (1, N = 38) = 17.1, $p < .01$. The proportion of respondents who preferred either (52) (P = 0.54) or (53) (P = 0.41) was greater than the proportion of respondents who preferred neither (P = .03). However, the proportion of respondents who preferred (52) over (53) was not significant, χ^2 (1, N = 37) = 0.68, $p = .41$.

A chi-square test of independence (N = 36) indicated no significant difference between the early sequential and the late sequential groups, where the χ^2 value of 2.14 had an associated probability value of $p = 0.34$, DF = 2, Cramer's V = 0.24. The proportions of participants within each group preferring (52) or (53) are shown in Table 48 on the next page.

The proportion of early sequential bilinguals (N = 7) who preferred (52) was not significantly different to the proportion of late sequential bilinguals (N =14) who also preferred (52). This was also true for the proportion of early sequential bilinguals (N = 4) and late sequential bilinguals (N = 10) who preferred (53). One early sequential bilingual preferred neither, while the two simultaneous bilinguals both preferred (53).

	***Čo by si chcel* for breakfast?**	***Čo by si chcel na* breakfast?**	**Neither**
Simultaneous (N = 2)	0 (P = 0.0)	2 (P = 1.0)	0 (P = 0.0)
Early Sequential (N = 13)	7 (P = 0.58)	4 (P = 0.33)	1 (P = 0.08)
Late Sequential (N = 24)	14 (P = 0.58)	10 (P = 0.42)	0 (P = 0.0)

Table 48 Preferences within Groups for (52) and (53)

We spent summer holidays *u babky*.

(55) We spent summer holidays *u babk-y*

we spent summer holidays at grandmother-F.LOC

'we spent summer holidays at grandma's house'

Similar to other switches discussed in this section, (55) involves a switch at the boundary of a prepositional phrase. The locative prepositional phrase is Slovak, in contrast to (56) below.

A one sample chi-square test conducted to determine whether one judgment was significantly preferred over the others yielded significant results, χ^2 (2, N = 39) = 61.1, $p < .01$. The proportion of respondents who indicated that (55) was acceptable (P = 0.92) was much greater than the

proportion of respondents who found the switch questionable (P = 0.03) or unacceptable (P = 0.05).

The chi square test of independence for (55) indicated that there was no significant relationship between response and bilingual group, χ^2 (1, N = 37) = 1.15, p = 0.29, Cramer's V = 0.29. Given that 50% of the cells had an expected frequency of less than 5, the Fisher's Exact Probability was conducted, indicating p = 0.53. The proportion of responses in each group is shown in Table 49. Of the two simultaneous bilinguals, one found (55) acceptable and the other found it questionable.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	1 (P = 0.50)	1 (P = 0.50)	0 (P = 0.0)
Early Sequential (N = 13)	13 (P = 1.00)	0 (P = 0.0)	0 (P = 0.0)
Late Sequential (N = 24)	22 (P = 0.92)	0 (P = 0.0)	2 (P = 0.08)

Table 49 Proportions of Responses within Groups to (55)

We celebrated Christmas at *babky*.

(56) We celebrated Christmas at *babk-y*

we celebrated Christmas at grandmother-F.LOC

'we celebrated Christmas at grandma's house'

In contrast to (55), the switch in (56) occurs within the locative prepositional phrase. Though the preposition is in English, the compliment determiner phrase is in Slovak and is marked for case agreement.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others, with results approaching significance, χ^2 (2, N = 39) = 6.0, p = .05. However, the proportion of respondents who indicated that (56) was acceptable (P = 0.46) was not significantly greater than the proportion of respondents who found the switch unacceptable (P = 0.38), χ^2 (1, N = 33) = 0.27, p = .61. A smaller proportion of participants indicated that the switch was questionable (P = 0.15).

The 2 x 3 chi square test of independence for (56) was also nonsignificant, χ^2 (2, N = 37) = 2.00, p = 0.37, Cramer's V = 0.23. However, three cells had an expected count of less than five. The proportion of responses in each group is shown in Table 50.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	1 (P = 0.50)	0 (P = 0.0)	1 (P = 0.50)
Early Sequential (N = 13)	7 (P = 0.54)	3 (P = 0.23)	3 (P = 0.23)
Late Sequential (N = 24)	10 (P = 0.42)	3 (P = 0.12)	11 (P = 0.46)

Table 50 Proportions of Responses within Groups to (56)

Of the two simultaneous bilinguals, one found (56) acceptable and the other found it unacceptable, which reflects the disagreement within both the early sequential and late sequential groups.

Ranking task.

(55) We spent summer holidays *u babk-y*

we spent summer holidays at grandmother-F.LOC

'we spent summer holidays at grandma's house'

(56) We celebrated Christmas at *babk-y*

we celebrated Christmas at grandmother-F.LOC

'we celebrated Christmas at grandma's house'

In order to determine participant preference, (55) and (56) were also presented as a ranking task. Overall, 36 participants preferred (55) (90%), while only one preferred (56) (2.5%). Two participants indicated a preference for neither, and neither of these indicated a negative attitude towards CS.

A one sample chi-square test was conducted to determine whether one switch was significantly preferred over the others. The results were significant, χ^2 (2, N = 38) = 61.1, $p < .01$. The proportion of respondents who preferred (55) (P = 0.92) was much greater than the proportion of respondents who preferred (56) (P = 0.03) or neither (P = .05).

The chi square analysis of the two bilingual groups yielded a value of 1.15 (N = 36, DF = 1), with an associated probability of 0.29, Cramer's V = 0.18; however,

	We spent summer holidays *u babky*	**We celebrated Christmas at *babky***	**Neither**
Simultaneous (N = 2)	1 (P = 0.50)	1 (P = 0.50)	0 (P = 0.0)
Early Sequential (N = 13)	13 (P = 1.00)	0 (P = 0.0)	0 (P = 0.0)
Late Sequential (N = 24)	22 (P = 0.92)	0 (P = 0.0)	2 (P = 0.08)

Table 51 Preferences within Groups for (55) and (56)

50% of the cells had an expected frequency of less than five, so a Fisher's Exact Probability was conducted, yielding $p = 0.53$. The proportions of participants within each group preferring (55) or (56) are shown in Table 51. While 13 early sequential bilinguals and 22 late sequential bilinguals preferred (55), two late sequential bilinguals preferred neither. Of the two simultaneous bilinguals, one preferred (56) while the other preferred (55). Data from one participant was missing.

We wanted to go *do kina, ale nehrali nič zaujímavé.*

(57) We wanted to go *do kin-a ale ne-hra-l-i*

we wanted to go to cinema-N.GEN but NEG-play-PST-PL

nič zaujímav-é

nothing interesting-3.S

'we wanted to go to the cinema, but nothing interesting was playing'

The switch in (57) occurs at the boundary of the prepositional phrase. The language of the conjunctive complementizer phrase also contrasts with the language of the English verb phrase, *wanted to go*.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others. The results were significant, χ^2 (2, N = 39) = 37.5, $p < .01$. The proportion of respondents who indicated that (57) was acceptable (P = 0.79) was much greater than the proportion of respondents who found the switch questionable (P = 0.08) or unacceptable (P = 0.13).

The results of the 2 x 3 chi square test of independence for (57) were not significant, χ^2 (2, N = 37) = 6.43, $p = 0.40$, Cramer's V = 0.42. However, four cells had an expected count of less than five. The proportion of responses in each group is shown in Table 52. Of the two simultaneous bilinguals, one found (57) acceptable and the other found it questionable.

	Acceptable	Questionable	Unacceptable
Simultaneous (N = 2)	1 (P = 0.5.0)	1 (P = 0.50)	0 (P = 0.0)
Early Sequential (N = 13)	11 (P = 0.85)	2 (P = 0.15)	0 (P = 0.0)
Late Sequential (N = 24)	19 (P = 0.79)	0 (P = 0.0)	5 (P = 0.21)

Table 52 Proportions of Responses within Groups to (57)

English Determiners

Switches presented in this section queried participants' judgments of the acceptability of an English determiner phrase occurring as the complement of a Slovak prepositional phrase. In particular, these switches test the acceptability of the presence of an English determiner.

***Prečo nenakupuješ v* Polish store?.**

(58) *Prečo ne-nakupuj-eš v* Polish store?

Why NEG-shop-2.S in Polish store

'why don't you shop in the Polish store?'

The English determiner phrase in (57), *Polish store*, is not headed by an English determiner, as would be grammatically required in English. However, the absence of a determiner does reflect the general absence of determiners in Slovak determiner phrases.

Responses to the acceptability of (58) were 100% (N = 39). As there was no variability in the response either within or across the early and late sequential groups, a χ^2 could not be conducted. Further, both simultaneous participants also found (58) to be acceptable.

***Prečo nenakupuješ v* the Polish store?.**

(59) *Prečo ne-nakupuj-eš v* the Polish store?

Why NEG-shop-2.S in the Polish store

'why don't you shop in the Polish store?'

In contrast to (58), (59) presents an English determiner phrase headed by the English determiner, *the*, as the complement of a Slovak prepositional phrase.

In contrast to (58) above, participants were not as homogenous in their judgment of (59). A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others. The results were significant, χ^2 (2, N = 39) = 19.8, $p < .01$. The proportion of respondents who indicated that (59) was acceptable (P = 0.67) was greater than the proportion of respondents who found the switch questionable (P = 0.13) or unacceptable (P = 0.21).

A 2 x 3 chi square test of independence test showed yielded a χ^2 value of 1.31, with an associated probability value of $p = 0.52$, DF = 2, Cramer's V = 0.19; however, three cells had an expected count of less than five. The results are displayed in Table 53. In contrast to the responses of the early and late sequential groups, both simultaneous bilinguals found (59) to be acceptable.

	Acceptable	Questionable	Unacceptable
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	8 (P = 0.61)	1 (P = 0.8)	4 (P = 0.31)
Late Sequential (N = 24)	16 (P = 0.66)	4 (P = 0.17)	4 (P = 0.17)

Table 53 Proportions of Responses within Groups to (59)

Ranking task.

(58) *Prečo ne-nakupuj-eš v* Polish store?

why NEG-shop-2.S in Polish store

'why don't you shop in the Polish store?'

(59) *Prečo ne-nakupuj-eš v* the Polish store?

why NEG-shop-2.S in the Polish store

'why don't you shop in the Polish store?'

Switches (58) and (59) were also presented as a ranking task. 37 participants preferred (58) over (59) (97.3%), while only one preferred (59) (2.7%). Data from one participant was missing.

A one sample chi-square test was conducted to determine whether one switch was significantly preferred over the others. The results were

significant, χ^2 (1, N = 39) = 35.1, $p < .01$. The proportion of respondents who preferred (58) (P = 0.97) was much greater than the proportion of respondents who preferred (59) (P = 0.03).

Further, the chi-square test of independence indicated no significant difference between the early sequential and the late sequential groups, where the χ^2 value of 0.56 had an associated probability value of $p = 0.46$, DF = 1, Cramer's V = 0.12. The proportions of participants within each group preferring (58) or (59) are shown in Table 54.

	***Prečo nenakupuješ v* Polish store?**	***Prečo nenakupuješ v* the Polish store?**	**Neither**
Simultaneous (N = 2)	2 (P = 1.00)	0 (P = 0. 0)	0 (P = 0.0)
Early Sequential (N = 13)	13 (P = 1.00)	0 (P = 0.0)	0 (P = 0.0)
Late Sequential (N = 24)	23 (P = 0.96)	1 (P = 0.04)	0 (P = 0.0)

Table 54 Preferences within Groups for (58) and (59)

Given that 50% of the cells had an expected count of less than five, a Fisher's Exact Test was conducted, yielding $p = 1.00$.

The proportion of early sequential bilinguals (N = 13) who preferred (58) was not significantly different to the proportion of late sequential

bilinguals (N = 23) who also preferred (58). As for the two simultaneous bilinguals, both also preferred (58).

Môj brat ma auto s *full dual exhaust kit.*

(60) *Môj* *brat* *ma* *auto* *s* full dual exhaust kit

1.S.POSS-1.M brother have-3.S car with full dual exhaust kit

'my brother has a car with the full dual exhaust kit'

Similar to (58), (60) presents a switch where the English determiner phrase, as a complement of a Slovak prepositional phrase, is not headed by an English determiner.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	12 (P = 0.92)	1 (P = 0.8)	0 (P = 0.0)
Late Sequential (N = 24)	20 (P = 0.83)	3 (P = 0.13)	1 (P = 0.4)

Table 55 Proportions of Responses within Groups to (60)

The acceptability of (60) was not as universal as the acceptability of (58). A one sample chi-square test conducted to determine whether one judgment was significantly preferred over the others did yield significant results, χ^2 (2, N = 39) = 51.2, $p < .01$. The proportion of respondents who indicated that (60) was acceptable (P = 0.87) was much greater than the

proportion of respondents who found the switch questionable (P = 0.10) or unacceptable (P = 0.03).

The 2 x 3 chi square test of independence conducted on responses to (60) indicated that there was no significant difference in responses across the two bilingual groups. The χ^2 value of 0.80 had an associated probability value of $p = 0.67$, DF = 2, Cramer's V = 0.15. However, four cells had an expected count of less than five. Table 55 on the previous page shows the proportions of responses within the early and late sequential groups. Both simultaneous bilingual participants found (60) to be acceptable, mirroring the general trend in both the early sequential and late sequential bilingual groups.

Môj brat ma auto s *the full dual exhaust kit*.

(61) *Môj brat ma auto s* the full dual exhaust kit

1.S.POSS-1.M brother have-3.S car with the full dual exhaust kit

'my brother has a car with the full dual exhaust kit'

In contrast to (60), but similar to (59), (61) presents a switch where an English determiner phrase is the complement of a Slovak prepositional phrase, and the English determiner phrase is headed by the English determiner, *the*.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others. The results were significant, χ^2 (2, N = 39) = 16.8, $p < .01$. Follow-up tests indicated that the proportion of respondents who indicated that (61) was acceptable (P = 0.64) was greater than the proportion of respondents who found the switch

questionable (P = 0.15), χ^2 (1, N = 31) = 11.6, $p < .01$, or unacceptable (P = 0.21), χ^2 (1, N = 33) = 8.6, $p < .01$.

Similar to other tasks in this section, the 2 x 3 chi square test of independence conducted on responses to (61) indicated no significant differences in responses between the two groups. The χ^2 value of 3.46 had an associated probability value of $p = 0.18$, DF = 2, Cramer's V = 0.31. However, three cells had an expected frequency of less than five. Responses to this task are displayed below in Table 56.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	6 (P = 0.46)	4 (P = 0.31)	3 (P = 0.23)
Late Sequential (N = 24)	17 (P = 0.71)	2 (P = 0.08)	5 (P = 0.21)

Table 56 Proportions of Responses within Groups to (61)

Both simultaneous bilinguals found (61) acceptable, though one indicated *sounds funny, but probably okay* consistently.

Ranking task.

(60) *Môj brat ma auto s* full dual

1.S.POSS-1.M brother have-3.S car with full dual

exhaust kit

exhaust kit

'my brother has a car with the full dual exhaust kit'

(61) *Môj brat ma auto s* the full dual

exhaust kit

1.S.POSS-1.M brother have-3.S car with the full dual

exhaust kit

'my brother has a car with the full dual exhaust kit'

As with (58) and (59), (60) and (61) were presented as a ranking task in order to determine participant preference. 37 participants preferred (60) over (61) (92.5%), while none preferred (61) over (60). Two participants preferred neither (60) nor (61) (5%), but neither indicated a negative attitude towards CS.

A goodness of fit chi-square test was conducted to determine whether one switch was significantly preferred over the others. The results were significant, χ^2 (1, N = 39) = 31.4, $p < .01$. The proportion of respondents who preferred (60) (P = 0.95) was much greater than the proportion of respondents who preferred neither (P = 0.05). No respondents indicated a preference (61). The chi-square test of independence indicated no significant difference between the early sequential and the late sequential groups, where the χ^2 value

of 1.15 had an associated probability value of $p = 0.29$, DF = 1, Cramer's V = 0.18.

Given that 50% of the cells had an expected count of less than five, a Fisher's Exact Test was conducted, yielding $p = 0.53$. The proportions of participants within each group preferring (60) or (61) are shown in Table 57 above. The proportion of early sequential bilinguals (N = 13) who preferred (60) was not significantly different to the proportion of late sequential bilinguals who also preferred (60). The two participants who indicated that neither switch was preferable were both late sequential bilinguals. As for the two simultaneous bilinguals, both also preferred (60).

	***Môj brat ma auto s* full dual exhaust kit**	***Môj brat ma auto s* the full dual exhaust kit**	**Neither**
Simultaneous (N = 2)	2 (P = 1.00)	0 (P = 0. 0)	0 (P = 0.0)
Early Sequential (N = 13)	13 (P = 1.00)	0 (P = 0.0)	0 (P = 0.0)
Late Sequential (N = 24)	22 (P = 0.92)	0 (P = 0.0)	2 (P = 0.08)

Table 57 Preferences within Groups for (60) and (61)

Modal Auxiliaries

The switches presented in this section test the acceptability of switching between the finite modal and its nonfinite complement within modal auxiliary phrases. Slovak and English modals both subcategorize for a nonfinite complement and must agree with their subjects.

***Budeme* travel to Brighton?.**

(62) *Bud-eme* travel to Brighton

FUT-1.S.PL travel to Brighton

'will we travel to Brighton?'

The switch presented in (62) involves an auxiliary phrase headed by the Slovak future modal, *budeme*, with a non-finite English complement.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others, which yielded significant results, χ^2 (2, N = 39) = 22.8, $p < .01$. The proportion of respondents who indicated that (62) was acceptable (P = 0.69) was much greater than the proportion of respondents who found the switch questionable (P = 0.13), χ^2 (1, N = 32) = 15.1, $p < .01$, or unacceptable (P = 0.18), χ^2 (1, N = 34) = 11.8, $p < .01$.

The 2 x 3 chi square test of independence for (62) indicated that there was no significant relationship between response and bilingual group, χ^2 (2, N = 37) = 0.7, $p = 0.71$, Cramer's V = 0.14. Four cells had an expected count of less than five. The proportion of responses in each group is shown in Table 58.

	Acceptable	Questionable	Unacceptable
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	9 (P = 0.69)	1 (P = 0.8)	3 (P = 0.23)
Late Sequential (N = 24)	16 (P = 0.66)	4 (P = 0.17)	4 (P = 0.17)

Table 58 Proportions of Responses within Groups to (62)

The simultaneous bilinguals both responded that (62) was acceptable, following the weak trend in both early and late sequential bilingual groups.

***Chcete* drink wine *alebo* beer?.**

(63) *Chce-te* drink wine *alebo* beer

want-2.PL drink wine or beer

'would you like to drink wine or beer?'

Similar to (62), (63) presents a switch between a Slovak modal auxiliary and an English nonfinite verb. However, a second switch occurs in the object phrase of the verb with the Slovak conjunction, *alebo*.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others, and the results were significant, χ^2 (2, N = 39) = 51.2, $p < .01$. The proportion of respondents who indicated that (63) was acceptable (P = 0.87) was much greater than the

proportion of respondents who found the switch questionable (P = 0.03) or unacceptable (P = 0.10).

The 2 x 3 chi square test of independence for (63) yielded nonsignificant results, χ^2 (2, N = 37) = 0.80, p = 0.67, Cramer's V = 0.15. Four cells had an expected count of less than five. The proportion of responses in each group is shown in Table 59. Both simultaneous bilinguals responded that (63) was acceptable, following the general trend across the two other bilingual groups.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	12 (P = 0.92)	0 (P = 0.0)	1 (P = 0.08)
Late Sequential (N = 24)	20 (P = 0.83)	1 (P = 0.04)	3 (P = 0.13)

Table 59 Proportions of Responses within Groups to (63)

***Možeme* finish the presentation *dnes*.**

(64) *Može-me* finish the presentation *dnes*

can-1.PL finish the presentation today

'can we finish the presentation today?'

As with other switches in this section, (64) queries the acceptability of a switch between the Slovak modal auxiliary, *možeme*, and its nonfinite complement. Further, a second switch occurs with the Slovak adverbial, *dnes*.

A one sample chi-square test conducted to determine whether one judgment was significantly preferred over the others yielded significant results, χ^2 (2, N = 39) = 24.0, $p < .01$. The proportion of respondents who indicated that (64) was acceptable (P = 0.69) was much greater than the proportion of respondents who found the switch questionable (P = 0.08), χ^2 (1, N = 30) = 19.2, $p < .01$, or unacceptable (P = 0.23), χ^2 (1, N = 36) = 9.0, $p < .01$.

The 2 x 3 chi square test of independence for (64) indicated that there was no significant relationship between response and bilingual group, χ^2 (2, N = 37) = 0.92, $p = 0.63$, Cramer's V = 0.16. However, three cells had an expected count of less than five. The proportion of responses in each group is shown in Table 60.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	10 (P = 0.77)	1 (P = 0.07)	2 (P = 0.15)
Late Sequential (N = 24)	15 (P = 0.63)	2 (P = 0.08)	7 (P = 0.29)

Table 60 Proportions of Responses within Groups to (64)

The simultaneous bilinguals both responded that (64) was acceptable, following the general trend in both the early and late sequential bilingual groups.

***Mohli by sme* finish watching the movie?.**

(65) *Mo-hl-i* *by* *sme* finish watching the movie

can-PST-PL COND AUX.1.PL finish watching the movie

'could we finish watching the movie?'

In contrast to other switches in this section, (65) presents a switch where the Slovak auxiliary modal is part of the conditional construction, *mohli by sme*, but the nonfinite verb phrase complement is in English.

The one sample chi-square test conducted to determine whether one judgment was significantly preferred over the others produced significant results, χ^2 (2, N = 39) = 41.7, $p < .01$. The proportion of respondents who indicated that (65) was acceptable (P = 0.82) was much greater than the proportion of respondents who found the switch questionable (P = 0.10) or unacceptable (P = 0.08).

The 2 x 3 chi square test of independence for (65) indicated that there was no significant relationship between response and bilingual group, χ^2 (2, N = 37) = 4.68, $p = 0.10$, Cramer's V = 0.36. Further, three cells had an expected count of less than five. The proportion of responses in each group is shown in Table 61. The simultaneous bilinguals both responded that (65) was acceptable.

	Acceptable	Questionable	Unacceptable
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	13 (P = 1.00)	0 (P = 0.0)	0 (P = 0.0)
Late Sequential (N = 24)	17 (P = 0.71)	4 (P = 0.17)	3 (P = 0.12)

Table 61 Proportions of Responses within Groups to (65)

Progressive Auxiliaries

The switches discussed in this final section test the acceptability of a Slovak auxiliary occurring with an English progressive participle in a progressive construct. The progressive aspect in Slovak is expressed through verbal prefixation, in contrast to English, though Slovak auxiliaries do occur with participles in other constructions, such as in the past tense.

***Trošku bola* bleeding.**

(66) *Trošku Ø bol-a* bleeding

little pro AUX.PST-FEM bleeding

'she was bleeding a bit'

The switch in (66) represents a switch in the basic context of a progressive auxiliary construction. The Slovak auxiliary, *bola*, co-occurs with the English progressive participle, *bleeding*.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others. The results were significant, χ^2 (2, N = 39) = 17.1, $p < .01$. Follow-up tests indicated that the proportion of respondents who found (66) unacceptable (P = 0.62) was significantly greater than the proportion of respondents who found the switch questionable (P = 0.08), χ^2 (1, N = 27) = 16.3, $p < .01$, or acceptable (P = 0.31), χ^2 (1, N = 36) = 4.0, $p = .05$.

The 2 x 3 chi square test of independence for (66) indicated that there was no significant relationship between response and bilingual group, χ^2 (2, N = 37) = 0.47, $p = 0.80$, Cramer's V = 0.11. However, three cells had an expected count of less than five. The proportion of responses in each group is shown in Table 62.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	1 (P = 0.50)	0 (P = 0.0)	1 (P = 0.50)
Early Sequential (N = 13)	3 (P = 0.23)	1 (P = 0.08)	9 (P = 0.69)
Late Sequential (N = 24)	8 (P = 0.33)	2 (P = 0.08)	14 (P = 0.58)

Table 62 Proportions of Responses within Groups to (66)

One simultaneous bilingual found (66) acceptable, while the other found it unacceptable, mirroring the general disagreement about the acceptability of the switch.

Bol som tri hodiny* chatting *s kamarátom vo Švédsku.

(67) *Bol-Ø* *som* *tri* *hodin-y* chatting *s*

AUX.PST-M AUX.1.S three hour-PL chatting with

kamarát-om *vo* *Švédsk-u*

friend- M.INS in Sweden-N.LOC

'I was chatting with my friend in Sweden for three hours'

Similar to (66), (67) presents a switch where the English progressive participle, *chatting*, co-occurs with the Slovak auxiliary, *bol*. In this case, the auxiliary verb phrase has also been fronted.

The one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others produced significant results, χ^2 (2, N = 39) = 14.3, $p < .01$. Follow-up tests showed that the proportion of respondents who indicated that (67) was unacceptable (P = 0.62) was much greater than the proportion of respondents who found the switch questionable (P = 0.15), χ^2 (1, N = 30) = 10.8, $p < .01$, or acceptable (P = 0.23), χ^2 (1, N = 33) = 6.8, $p < .01$.

Further, the 2 x 3 chi square test of independence for (67) indicated that there was no significant relationship between response and bilingual group, χ^2 (2, N = 37) = 3.54, $p = 0.17$, Cramer's V = 0.31. Three cells had an expected frequency of less than five. The proportion of responses in each group is shown in Table 63.

	Acceptable	Questionable	Unacceptable
Simultaneous (N = 2)	1 (P = 0.50)	1 (P = 0.50)	0 (P = 0.0)
Early Sequential (N = 13)	4 (P = 0.31)	0 (P = 0.0)	9 (P = 0.69)
Late Sequential (N = 24)	4 (P = 0.17)	5 (P = 0.21)	15 (P = 0.62)

Table 63 Proportions of Responses within Groups to (67)

One simultaneous bilingual found (67) acceptable, while the other found it questionable, which reflects the general disagreement within the groups.

***Je* speaking with his brother**.

(68) Ø *je* speaking with his brother

pro AUX.3.S speaking with his brother

'he is speaking with his brother'

Similar to (66) and (67), the switch presented in (68) involves a Slovak auxiliary and an English progressive participle. In this case, the preposition complement of the verb phrase is also in English.

A one sample chi-square test was conducted to determine whether one judgment was significantly preferred over the others, which produced significant results, χ^2 (2, N = 39) = 14.0, $p < .01$. Follow-up tests showed that the proportion of respondents who indicated that (68) was unacceptable (P = 0.56) was significantly greater than the proportion of respondents who found

the switch questionable (P = 0.08), χ^2 (1, N = 25) = 14.4, $p < .01$, but not significantly greater than those who found acceptable (P = 0.36), χ^2 (1, N = 36) = 1.8, $p = .18$.

The 2 x 3 chi square test of independence for (68) indicated that there was a significant relationship between response and bilingual group, χ^2 (2, N = 37) = 6.91, $p = 0.03$, Cramer's V = 0.43.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	7 (P = 0.54)	2 (P = 0.15)	4 (P = 0.31)
Late Sequential (N = 24)	5 (P = 0.21)	1 (P = 0.04)	18 (P = 0.75)

Table 64 Proportions of Responses within Groups to (68)

However, three cells had an expected count of less than five. The proportion of responses in each group is shown in Table 64. The simultaneous bilinguals both responded that (68) was acceptable, following the slight trend in the early sequential group.

Je* speaking *so svojím bratom.

(69) *Ø je* speaking *so svoj-ím bratom*

pro AUX.3.S speaking with POSS-M.INS brother-M.INS

's/he is speaking with her/his brother'

In contrast to (68), (69) presents a switch between a Slovak finite auxiliary and an English progressive participle, where the prepositional complement is entirely in Slovak.

The one sample chi-square test conducted to determine whether one judgment was significantly preferred over the others yielded significant results, χ^2 (2, N = 39) = 10.3, p = .01. Follow-up tests showed that the proportion of respondents who found (69) unacceptable (P = 0.51) was significantly greater than the proportion of respondents who found the switch questionable (P = 0.05), χ^2 (1, N = 24) = 10.7, p < .01, but not significantly greater than the proportion of respondents who found (69) acceptable (P = 0.38), χ^2 (1, N = 35) = 0.71, p = .40.

Similar to (68), the 2 x 3 chi square test of independence for (69) indicated that there was no significant relationship between response and bilingual group, χ^2 (2, N = 37) = 4.40, p = 0.11, Cramer's V = 0.35. In addition, three cells had an expected count of less than five. The proportion of responses in each group is shown in Table 65. The simultaneous bilinguals both responded that (69) was acceptable, following the slight trend in the early sequential bilingual group.

	Acceptable	Questionable	Unacceptable
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	7 (P = 0.54)	2 (P = 0.15)	4 (P = 0.31)
Late Sequential (N = 24)	6 (P = 0.21)	2 (P = 0.04)	16 (P = 0.75)

Table 65 Proportions of Responses within Groups to (69)

***Si* chatting *na Facebooku*?.**

(70) *Si* chatting *na Facebook-u*

AUX.2.S chatting on Facebook-M.LOC

'are you chatting on Facebook?'

The switch in (70) presents an interrogative progressive construction. The word order reflects the English word order of an interrogative progressive construction even though the auxiliary is Slovak. The progressive participle is in English, and the adverbial phrase is Slovak.

The one sample chi-square test conducted to determine whether one judgment was significantly preferred over the others produced results approaching significance, χ^2 (2, N = 39) = 5.7, p = .06. The proportion of respondents who indicated that (70) was acceptable (P = 0.44) or unacceptable (P = 0.41) was greater than the proportion of respondents who found the

switch questionable (P = 0.15). However, there was not a significant difference between the proportions of respondents who found (70) acceptable or unacceptable, χ^2 (1, N = 33) = .03, p = .86.

The 2 x 3 chi square test of independence for (70) indicated that there was no significant relationship between response and bilingual group, χ^2 (2, N = 37) = 0.71, p = 0.70, Cramer's V = 0.14. Only two cells had an expected count of less than five. The proportion of responses in each group is shown in Table 66.

	Acceptable	**Questionable**	**Unacceptable**
Simultaneous (N = 2)	2 (P = 1.0)	0 (P = 0.0)	0 (P = 0.0)
Early Sequential (N = 13)	5 (P = 0.39)	3 (P = 0.23)	5 (P = 0.38)
Late Sequential (N = 24)	10 (P = 0.42)	3 (P = 0.12)	11 (P = 0.45)

Table 66 Proportions of Responses within Groups to (70)

The simultaneous bilinguals both responded that (70) was acceptable, in contrast to the early sequential and late sequential groups.

Chatting *si na Facebooku*?.

(71) Chatting *si* *na* *Facebook-u*

chatting AUX.2.S on Facebook-M.LOC

'are you chatting on Facebook?'

In complement to (70), (71) presents a switch where the word order reflects Slovak interrogative word order. The English progressive particle is fronted, while the Slovak finite auxiliary and the locative prepositional phrase remain in situ.

The one sample chi-square test conducted to determine whether one judgment was significantly preferred over the others yielded significant results, χ^2 (2, N = 39) = 26.3, $p < .01$. Follow-up tests found that the proportion of respondents who indicated that (71) was unacceptable (P = 0.72) was much greater than the proportion of respondents who found the switch questionable (P = 0.10), χ^2 (1, N = 32) = 18.0, $p < .01$, or acceptable (P = 0.18), χ^2 (1, N = 35) = 12.6, $p < .01$.

Similar to (70), the 2 x 3 chi square test of independence for (71) indicated that there was no significant relationship between response and bilingual group, χ^2 (2, N = 37) = 0.70, $p = 0.71$, Cramer's V = 0.14, though four cells had an expected count of less than five. The proportion of responses in each group is shown in Table 67. One simultaneous bilingual found (71) acceptable, while the other found it questionable, following the general trend across groups.

	Acceptable	Questionable	Unacceptable
Simultaneous (N = 2)	1 (P = 0.50)	1 (P = 0.50)	0 (P = 0.0)
Early Sequential (N = 13)	3 (P = 0.23)	1 (P = 0.08)	9 (P = 0.69)
Late Sequential (N = 24)	3 (P = 0.12)	2 (P = 0.08)	19 (P = 0.79)

Table 67 Proportions of Responses within Groups to (71)

Summary of the Slovak-English grammaticality data

In general, the data from the Slovak-English grammaticality judgments have shown that there is not much variation across the three bilingual groups in judging the grammaticality of the switches presented in the survey. Overall, the chi square goodness of fit tests show that participants as a whole tended to agree on the grammaticality of the switch presented. More specifically, 37 of the 46 total switches queried produced a significantly preferred switch, indicating that the participants, regardless of age of onset of exposure, had the same grammatical intuitions for 80% of the switches. A summary of the traditional grammaticality judgment tasks which produced a significantly preferred judgment are presented in Table 68 on the following pages.

Switch Task	Significantly Preferred Judgment	Proportion of Participants
(35) *Ona* has decided to travel *domov*	Acceptable	0.87
(36) She has decided to travel *domov*	Acceptable	0.92
(38) The fox was wild, but *jedla z mojej ruky*	Acceptable	0.90
(39) We *sme chceli pozerat'* Champions League	Acceptable	0.77
(40) I *mám rada* beans on toast	Acceptable	0.67
(41) *Mám rada* beans on toast	Acceptable	0.92
(42) *Uhrýzol t'a* the dog?	Acceptable	0.69
(44) The cat *ho poškrabala na nohe*	Acceptable	0.87
(46) What's so important about a *rybu*?	Unacceptable	0.82
(48) Yesterday I went *autobusom*, but today I took the train	Acceptable	0.82
(49) I took the *psa na prechádzku*	Acceptable	0.69
(50) *Videl som* the American bloke *včera*	Acceptable	0.74
(51) *Musel som krmiť* my neighbor's fish *cez víkend*	Acceptable	0.87
(52) *Čo by si chcel* for breakfast?	Acceptable	0.97
(53) *Čo by si chcel na* breakfast?	Acceptable	0.87
(54) *Čo by si chcel na* breakfast today?	Acceptable	0.90
(55) We spent summer holidays *u babky*	Acceptable	0.92

Table 68 Tasks producing significant judgments (continued on next page)

Switch Task	Significantly Preferred Judgment	Proportion of Participants
(58) *Prečo nenakupuješ v* Polish store?	Acceptable	1.00
(59) *Prečo nenakupuješ v* the Polish store?	Acceptable	0.67
(60) *Môj brat ma auto s* full dual exhaust kit	Acceptable	0.87
(61) *Môj brat ma auto s* the full dual exhaust kit	Acceptable	0.64
(62) *Budeme* travel to Brighton	Acceptable	0.69
(63) *Chcete* drink wine *alebo* beer	Acceptable	0.87
(64) *Možeme* finish the presentation *dnes*	Acceptable	0.69
(65) *Mohli by sme* finish watching the movie	Acceptable	0.82
(66) *Trošku bola* bleeding	Unacceptable	0.62
(67) *Bol som tri hodiny* chatting *s kamarátom vo Švédsku*	Unacceptable	0.62
(71) Chatting *si na Facebooku?*	Unacceptable	0.72

Table 68, continued, Tasks producing significant judgments

The ranking tasks also tended to produce a preferred switch, as indicated by the goodness of fit tests. A summary of the preferred switches in the ranking tasks is presented in Table 69.

The exceptions to this pattern involve switches in very specific syntactic contexts, which are presented in Table 70. For instance, participants did not agree on the grammaticality of (37), a switch involving a third person subject pronoun. Further, there is disagreement in the grammaticality of some switches involving case-receiving noun phrases, such as (47) and (56), and in

some switches querying word order, such as (43) and (45). In these cases, though participants did not agree on the grammaticality of those particular switches in isolated contexts, it is interesting to note that they did agree in preference when the switches were presented as part of a ranking task. However, participants were not uniform in their preferences on all ranking tasks, as seen in the ranking tasks for (46) and (47) and for (52) and (53).

Preferred Switch	**Proportion of Participants Preferring the switch**
(36) She has decided to travel *domov*	0.87
(38) The fox was wild, but *jedla z mojej ruky*	0.92
(41) *Mám rada* beans on toast	0.97
(44) The cat *ho poškrabala na nohe*	0.87
(55) We spent summer holidays *u babky*	0.92
(58) *Prečo nenakupuješ v* Polish store?	0.97
(60) *Môj brat ma auto s* full dual exhaust kit	0.95

Table 69 Ranking tasks with a preferred switch

The most notable sustained disagreement among participants involved switches in a progressive auxiliary construct. Of the five switches querying the grammaticality of a Slovak auxiliary occurring with an English progressive participle, participants only agreed on the ungrammaticality of (67) and (71).

Judgments of switches (68), (69), and (70), which all presented similar constructions to that in (67) and (71), were split between acceptable and unacceptable.

Task presented	**Proportion of Acceptable Responses**	**Proportion of Questionable Responses**	**Proportion of Unacceptable Responses**
(37) The fox was wild, but it *jedla z mojej ruky*	0.44	0.18	0.38
(43) The cat *poškrabala ho na nohe*	0.31	0.15	0.54
(45) *Poškrabala ho* the cat *na nohe*	0.41	0.15	0.44
(47) What's so important about a *ryba*?	0.51	0.03	0.46
(56) We celebrated Christmas at *babky*	0.46	0.15	0.38
(68) *Je* speaking with his brother	0.36	0.08	0.56
(69) *Je* speaking *so svojím bratom*	0.38	0.05	0.51
(70) *Si* chatting *na Facebooku?*	0.44	0.15	0.41

Table 70 Tasks producing nonsignificant judgments

Despite the general agreement in judgments indicated by the goodness of fit tests, the bilingual groups did not always respond as uniformly. In some cases, the two simultaneous bilinguals did not judge switches the same as the early sequential and late sequential groups, and in other cases, the late sequential bilingual group found switches ungrammatical, when the simultaneous bilinguals and the early sequential bilinguals did not. The few cases where there is a significant relationship between bilingual group and grammaticality judgment are presented in Table 71 on the next page. Overall though, the three groups had similar judgment patterns in 74% of the switches presented.

Disagreement among the groups was also more salient in certain syntactic contexts. For instance, judgment of (47) and the associated ranking task, which involved case-marked Slovak nouns in English determiner phrases, was split between the simultaneous and early sequential bilinguals, who found (47) to be acceptable and indicated a preference in the ranking task, and the majority of the late bilinguals, who indicated that (47) was ungrammatical and preferred neither switch in the ranking task. In fact, in cases where there was disagreement among the bilingual groups, the late sequential bilinguals tended to find switches ungrammatical when the simultaneous and early sequential bilingual groups found switches acceptable, as in (37), (43), and the progressive auxiliary switches.

The judgments of the series of progressive auxiliary switches (67) – (71) present an interesting pattern. The simultaneous bilinguals found the switches to be generally acceptable, whereas the early sequential bilinguals

and late sequential bilinguals did not. The early sequential bilinguals were split in their judgment of the acceptability of (67) – (71), while the late sequential bilinguals, though also split, tended to find the switches unacceptable.

Overall, the data show that there is not much difference in how simultaneous, early sequential, and late sequential bilinguals judged the codeswitches. The general trend indicates agreement in the grammaticality of most switches across all

Task presented	Acceptable	Questionable	Unacceptable
(47) What's so important about a *ryba*?	Simultaneous (P = 1.0) Early Sequential (P = 0.85) Late Sequential (P = 0.29)	Simultaneous (P = 0.0) Early Sequential (P = 0.0) Late Sequential (P = 0.04)	Simultaneous (P = 0.0) Early Sequential (P = 0.15) Late Sequential (P = 0.67)
(68) *Je* speaking with his brother	Simultaneous (P = 1.0) Early Sequential (P = 0.54) Late Sequential (P = 0.21)	Simultaneous (P = 0.0) Early Sequential (P = 0.15) Late Sequential (P = 0.04)	Simultaneous (P = 0.0) Early Sequential (P = 0.31) Late Sequential (P = 0.75)

Table 71 Summary of Switches showing a significant relationship between judgment and bilingual group

participants, though specific syntactic contexts produced varying judgments among the participants and across bilingual groups. In order to contextualize these findings, the results from the analysis of the naturalistic data in the Siarad corpus substudy will now be discussed.

The Siarad Corpus

The Welsh-English Siarad corpus (http://www.siarad.org.uk/siarad.php) sub-study serves as a secondary dataset in order to contextualize the results of the Slovak-English study discussed above. McAlister and Lloyd (2009) have presented a preliminary two-pronged comparative analysis focusing on the relationship between age of onset of exposure and a speaker's normed token means, and the relationship between a speaker's chronological age and their normed token means. This section will offer an in-depth discussion of the age of onset of exposure analysis.

Normed Token Means

Normed token means were calculated for each speaker in the corpus, and are re-presented from Chapter Three in Tables 72 and 73 on the following pages. The tokens of interest for this study include those marked as English, Mixed, or Undetermined in the corpus. Table 72 presents the overall token means for simultaneous, early sequential and late sequential speakers.

In general, it is evident from Table 72 that English and mixed tokens represent a small amount of the corpus. Particularly in the case of mixed tokens, the mean number of mixed tokens per 1000 is less than three across all groups. Similarly, the number of English tokens averages less than fifty per 1000 across the different bilingual groups. Further, Table 73 shows that the

pattern is similar when the early and late sequential groups are subdivided according to first language (L1).

	Simultaneous (N = 61)	**Early Sequential (N = 49)**	**Late Sequential (N = 12)**
Mean English Tokens per 1000	46.8 (SD = 33.87)	26.2 (SD = 29.18)	21.8 (SD = 17.21)
Mean Mixed Tokens per 1000	2.3 (SD = 2.93)	1.0 (SD = 1.21)	0.6 (SD = 0.62)
Mean Undetermined Tokens per 1000	128.8 (SD = 38.21)	125.8 (SD = 38.81)	155.8 (SD = 48.63)

Table 72 Normed Token Means According to Age of Acquisition

	Simultaneous (N = 61)	Early Sequential		Late Sequential	
		Welsh L1 (N = 41)	English L1 (N = 8)	Welsh L1 (N = 6)	English L1 (N = 6)
Mean English Tokens per 1000	46.8 (SD = 33.87)	27.0 (SD = 30.94)	22.1 (SD = 18.58)	22.1 (SD = 22.38)	21.5 (SD = 12.26)
Mean Mixed Tokens per 1000	2.3 (SD = 2.93)	0.9 (SD = 1.19)	1.4 (SD = 1.33)	0.8 (SD = 0.73)	0.5 (SD = 0.49)
Mean Undetermined Tokens per 1000	128.8 (SD = 38.23)	126.8 (SD = 37.32)	120.7 (SD = 48.32)	143.3 (SD = 27.00)	168.2 (SD = 64.03)

Table 73 Normed Token Means according Age of Acquisition with L1

Results of ANOVAs

Initial tests of variance were conducted using a one-way between-groups analysis of variance (ANOVA). A one-way between groups ANOVA compares the variance in means between different groups that are divided according to one independent variable. In the case of this study, the Welsh-English bilinguals were divided according to age of acquisition, the independent variable, and the normed mean token rates for English, undetermined and mixed tokens, the dependent variables, were compared.

Use of English Tokens.

A one-way between-groups analysis of variance was conducted to explore the effect of general age of acquisition on the use of English tokens in Welsh-English speech, as measured by the normed token means for English. Specifically, the participants were divided according to their general age of acquisition (simultaneous, early sequential, late sequential) without reference to their L1. There was a statistically significant difference at the $p < .01$ level for the three groups ($F(2,119) = 7.5$, $p = .001$). The effect size, calculated using eta squared, was .11. Post-hoc comparisons using the Tukey HSD test indicated that the normed English token mean for the simultaneous bilinguals (M = 46.81, SD = 33.87) was significantly different from the early sequential group (M = 26.22, SD = 29.18) and the late sequential group (M = 21.79, SD = 17.21). The early sequential and late sequential groups did not differ from each other significantly.

A further one-way between-groups ANOVA was conducted to determine differences between groups divided according to age of acquisition and L1

(simultaneous, early sequential with Welsh L1, early sequential with English L1, late sequential with Welsh L1, and late sequential with English L1). Again, there was a statistically significant difference at the $p < .01$ level for the five groups ($F(4,117) = 3.7$, $p = .007$). The effect size, calculated using eta squared, was also .11. Post-hoc comparisons using the Tukey HSD test indicated that the normed English token mean for the simultaneous bilinguals ($M = 46.81$, $SD = 33.87$) was significantly different from the early sequential with Welsh L1 group ($M = 27.03$, $SD = 30.94$). The other groups did not differ significantly from each other.

Use of Undetermined Tokens.

A one-way between-groups analysis of variance was also conducted on the effect of general age of acquisition on the use of undetermined tokens in Welsh-English speech, as measured by the normed token means for undetermined tokens. As with the above ANOVAs, the participants were divided according to their general age of acquisition (simultaneous, early sequential, late sequential) without reference to their L1 for the initial ANOVA analysis. In this case, there was not a statistically significant difference among the three groups ($F(2,119) = 2.86$, $p = .06$), though the late sequential group ($M = 21.79$, $SD = 17.21$) approached significance ($p = .052$) in post-hoc Tukey HSD tests when compared to the early sequential group ($M = 26.22$, $SD = 29.18$). When the groups were analyzed with L1, there was also no significant difference.

Use of Mixed Tokens.

Finally, a one-way between-groups analysis of variance was conducted to explore the effect of general age of acquisition on the use of mixed tokens in

Welsh-English speech, as measured by the normed token means for mixed tokens. As above, the participants were initially divided according to their general age of acquisition (simultaneous, early sequential, late sequential) without reference to their L1. There was a statistically significant difference at the $p < .01$ level for the three groups ($F(2,119) = 5.6$, $p = .005$). The effect size, calculated using eta squared, was .09. Post-hoc comparisons using the Tukey HSD test indicated that the normed mixed token mean for the simultaneous bilinguals (M = 2.26, SD = 2.93) was significantly different from the early sequential group (M = 0.99, SD = 1.21), but not from the late sequential group (M = 0.62, SD = 0.62) ($p = 0.01$). The early sequential and late sequential groups did not differ from each other significantly.

A final one-way between-groups ANOVA was conducted to determine differences between groups divided according to age of acquisition and L1 (simultaneous, early sequential with Welsh L1, early sequential with English L1, late sequential with Welsh L1, and late sequential with English L1). There was a statistically significant difference at the $p < .05$ level ($F(4,117) = 2.858$, $p = .027$); however, the assumption of homogeneity of variance was violated ($p = .008$, using the Levene statistic). The effect size, calculated using eta squared, was .089. Post-hoc comparisons using the Tukey HSD test indicated that the normed mixed token mean for the simultaneous bilinguals (M = 1.33, SD = 0.45) was significantly different from the early sequential with Welsh L1 group (M = 0.93, SD = 1.19) ($p = .031$). The other groups did not differ significantly from each other.

Summary of the Welsh-English corpus data

Results from this substudy show that there are some differences in the normed token means for the three bilingual groups. In particular, the simultaneous bilinguals had a higher normed token mean for English and mixed tokens than the early sequential and late sequential bilinguals. This tentatively indicates that the simultaneous bilinguals tended to codeswitch more than the early and late sequential bilinguals. However, though the relatively low number of English and mixed tokens per 1000 tokens indicates that the difference is small.

Chapter Summary

This chapter has discussed results from the Slovak-English grammaticality judgment study and the Welsh-English Siarad Corpus substudy. Both studies point to some differences among the simultaneous, early sequential, and late sequential bilingual groups, though the differences themselves are not very pronounced. Data from the grammaticality judgment study show that participants agreed in the majority of their judgments, and that disagreement was restricted to specific syntactic contexts, such as progressive auxiliary switches. Further, disagreement of the acceptability of switches for the simultaneous, early sequential, and late sequential groups tended to also be restricted to these same syntactic contexts. Finally, analysis of the naturalistic Welsh-English corpus data shows that there is also not much difference in the amount of English and mixed tokens among the different bilingual groups, though some of these differences are statistically significant. Chapter Five now presents a discussion of the

implications of these findings for the fields of CS and language acquisition and further directions of research.

Conclusions

Chapter Five offers an analysis of the results of the Slovak-English grammaticality judgment study and Welsh-English Siarad Corpus sub-study presented in Chapter Four. Differences among bilingual groups will be discussed, in particular the implications of the results for the study of CS and SLA. The implications for research methods in CS will also be presented, along with the educational implications of the studies. Finally, the limitations and further directions for each of the studies will be discussed.

Differences among Bilingual Groups

The main aim of this dissertation has been to explore differences in CS patterns across simultaneous, early sequential, and late sequential bilinguals, as formulated by the primary research question, repeated below.

> Do Slovak-English codeswitchers evidence differences in grammaticality judgments as a function of onset of exposure to English?

Specifically, the study has investigated to what extent differences in elicited data are attributable to age of onset of exposure in English. In addition, the secondary research question

> What do other datasets, particularly the Siarad Corpus, demonstrate in terms of the effect of age of onset of exposure?

examines differences in naturalistic corpus data that might be a result of age of acquisition.

Elicited Data

The Slovak-English grammaticality judgment data detail the similarity in responses among the study participants. Though the sample is small (N = 39), it is surprising that participant intuitions are so homogenous. As outlined in Chapter Four, the chi square goodness of fit tests show that there was a significantly preferred judgment for 80% of the tasks. This lack of variability in the data affected the validity of the chi square tests of independence; however, the patterns of responses evident in the data suggest that the pattern of judgments across bilingual groups was consistent throughout most tasks. In other words, if participants in one bilingual group found a switch to be acceptable, then participants in the other groups generally also found that switch acceptable. Further, when there was disagreement within a group about the acceptability of a switch, that disagreement was usually reflected in the other two bilingual groups, as in (37) and (56). The switch presented in (37), repeated below, was acceptable for slightly less than half of the participants, while slightly more than a third of the participants found it unacceptable. However, a higher percentage of early sequential bilinguals found (37) acceptable than late sequential bilinguals.

(37) The fox was wild, but it *jedl-a* *z* *moj-ej* *ruk-y*

the fox was wild, but it eat-PST.F from my-GEN.F hand-GEN.F

'the fox was wild, but I ate out of my hand'

Similarly, participants disagreed on the acceptability of (56).

(56) We celebrated Christmas at *babk-y*

we celebrated Christmas at grandmother-F.LOC

'we celebrated Christmas at grandma's house'

In this case, only half of the participants in each group found the switch acceptable.

The tasks that did not produce an overall significantly preferred judgment involved specific syntactic contexts, as shown in Table 70 in Chapter Four. These tasks included switches that explored word order, case-marked Slovak nouns in English DPs, and the progressive auxiliary construction. While some of the participants felt that the switches in these tasks were grammatical, other participants found them either questionable or ungrammatical, indicating that these tasks represent contexts where Slovak and English constrain each other in interesting ways and should be explored further, as discussed below.

Though the ranking tasks also generally produced a preferred switch across all groups, the participants disagreed in preference on two of the ranking tasks. The first task, repeated below, queried preferences in case-marking on Slovak nouns in English DPs.

(46) What's so important about a *ryb-u*?

what's so important about a fish-F.ACC

'what's so important about a fish'

(47) What's so important about a *ryb-a*?

what's so important about a fish-F.NOM

'what's so important about a fish'

While one simultaneous bilingual preferred (46) and the other preferred (47), the early sequential bilinguals preferred (47), though two indicated a preference for neither. Among the late sequential bilinguals, 48% preferred (47) and 52% preferred neither. It should be noted that the task presenting (47) independently was one of the tasks where there was a significant relationship between response and bilingual group. The late bilinguals generally found (47) unacceptable while the simultaneous and early sequential bilinguals generally accepted (47). As this ranking task and traditional judgment task illustrate one of the contexts where there were differences in the pattern of responses across bilingual groups, the results indicate that case-marking in mixed DPs is one area for future research. Concrete conclusions cannot be drawn from these two tasks, but the results suggest that late sequential bilinguals are more sensitive to case-marking in mixed DPs.

The second ranking task, repeated below, which did not produce a significantly preferred switch, queried whether a full English PP was more preferred than a Slovak PP with an embedded English NP.

(52) *Čo by si chce-l-Ø* for breakfast

what COND AUX.2.SG want-PST-SG.M for breakfast

'what would you like for breakfast?'

(53) *Čo by si chcel na* breakfast

what COND AUX.2.SG want-PST-SG.M for breakfast

'what would you like for breakfast?'

When (52) and (53) were presented independently, both switches were found acceptable by the majority of participants in all bilingual groups. Specifically, only one early sequential indicated that neither switch was acceptable. 100% of the simultaneous bilinguals preferred (53), as did 33% of the early sequential bilinguals and 42% of the late sequential bilinguals. The remaining 58% of early sequential bilinguals and 58% of late sequential bilinguals preferred (52). The difference in preferences in the ranking tasks may have been due to personal preference, and indicates one area that warrants further investigation. In particular, the results of this ranking task indicate that it would be useful to have an option allowing participants to indicate equal preference for both switches.

Differences across bilingual groups were also evident in some of the tasks querying switching within a progressive auxiliary context. The judgments of (66) – (71) indicate that switching with a progressive auxiliary context is ungrammatical, as (66), (67), and (71) produced a significantly preferred negative judgment.

(66) *Trošku Ø bol-a* bleeding

little pro AUX.PST-FEM bleeding

'she was bleeding a bit'

(67) *Bol-Ø* *som* *tri* *hodin-y* chatting *s*

AUX.PST-M AUX.1.S three hour-PL chatting with

kamarát-om *vo* *Švédsk-u*

friend-M.INS in Sweden-N.LOC

'I was chatting with my friend in Sweden for three hours'

(71) Chatting *si* *na Facebook-u*

chatting AUX.2.S on Facebook-M.LOC

'are you chatting on Facebook?'

(69) and (70) tended toward a preference in negative judgment, though the simultaneous bilinguals found both (69) and (70) acceptable. Among the early sequential bilinguals, 54% found (69) acceptable, while 15% found (69) questionable and 31% found it unacceptable. In a similar trend, 39% of the early sequential bilinguals found (70) acceptable, but 39% also found (70) unacceptable. A further 22% indicated that it was questionable.

(69) *Ø* *je* speaking *so* *svoj-ím* *bratom*

pro AUX.3.S speaking with POSS-M.INS brother-M.INS

's/he is speaking with her/his brother'

(70) *Si* chatting *na Facebook-u*

AUX.2.S chatting on Facebook-M.LOC

'are you chatting on Facebook?'

Within the late sequential bilingual group, 75% and 45% found (69) and (70) unacceptable, respectively. In contrast, only 21% found (69) acceptable and 42% found (70) acceptable.

Finally, (68), repeated below, was the other judgment task where a significant relationship existed between bilingual group and the acceptability of the switch.

(68) Ø *je* speaking with his brother

pro AUX.3.SG speaking with his brother

'he is speaking with his brother'

Both simultaneous bilinguals found (68) acceptable, as did 54% of the early sequential bilinguals and 21% of the late sequential bilinguals. However, 75% of the late sequential bilinguals found (68) unacceptable.

Closer examination of the data from (66) – (71) indicates that the late sequential bilinguals generally found switching in progressive auxiliary constructions unacceptable, while the simultaneous and early sequential bilinguals were more likely to find the switches acceptable. The simultaneous bilinguals generally found switching within a progressive auxiliary construction acceptable, except in the case of (66) where one simultaneous bilingual indicated that (66) was unacceptable. The early sequential bilinguals were generally split in their acceptance of (66) – (71), except for a predominantly negative judgment of (70). These responses to (66) – (71) indicate another syntactic context that warrants further exploration, particularly with a larger simultaneous bilingual group.

Development of more tasks that query switching within a progressive auxiliary construction would shed further light on how progressive auxiliaries are sensitive to age of onset of exposure effects, particularly in codeswitches, and might also highlight differences in Aspect Phrases in Slovak and English.

Naturalistic Data

The analysis of the naturalistic data from the Welsh-English Siarad corpus shows that the simultaneous bilinguals use slightly more English tokens per thousand than both the early sequential and late sequential bilinguals. Specifically, the simultaneous bilinguals used significantly more English tokens than the early sequential bilinguals with Welsh as an L1. Further, the simultaneous bilinguals also used more mixed tokens than the early sequential and late sequential bilinguals, though a significant relationship (p = .008) only existed between the simultaneous bilinguals and early sequential bilinguals with Welsh as an L1 and the assumption of homogeneity of variance was violated. It should be pointed out that these significant relationships were mostly likely due to the comparable size of the simultaneous bilingual and early sequential with Welsh as L1 groups, as the early sequential with Welsh as an L2 and both late sequential groups were much smaller.

Regardless of group size, it is evident that the simultaneous bilinguals used more English tokens and more mixed tokens than the early sequential and late sequential bilinguals, regardless of L1, when comparing the normed token means for English tokens and mixed tokens. However, the differences in the

normed token means for the simultaneous bilinguals and the other groups are not that large in terms of real use. The normed token mean for English tokens for the simultaneous bilinguals is less than thirty tokens per thousand larger than the normed token means for the other bilingual groups. The difference in the normed token mean for mixed tokens for the simultaneous bilingual group is even smaller, representing an increase of one to two tokens per thousand compared to the other bilingual groups.

In summary, data from the simultaneous bilinguals in the Welsh-English Siarad corpus contained more English tokens per thousand and more mixed tokens per thousand than data from either the early sequential bilinguals or the late sequential bilinguals, regardless of L1. However, given the actual size of the difference in normed token means for English and mixed tokens among the groups, it is hard to argue that these differences are very meaningful. The implications of these results for CS studies and SLA are discussed below.

Implications for Codeswitching Studies

Both the data from the Slovak-English grammaticality judgments and the Siarad Corpus indicate that there are differences among simultaneous, early sequential, and late sequential bilinguals. However, the differences do not suggest that early sequential and late sequential bilinguals should be excluded from CS studies.

Data from the grammaticality judgments show that simultaneous, early sequential, and late sequential bilinguals varied in their acceptance of switches in

certain syntactic contexts, such as case-marking and progressive auxiliary constructions. However, the data do not show a clear difference in response. For instance, not all late sequential bilinguals found (47) ungrammatical, indicating that at least some late sequential bilinguals shared similar intuitions with the simultaneous and early sequential bilinguals. Moreover, the goodness of fit tests show that there was a significant preference in judgment in 80% of the judgment tasks, demonstrating that the participants shared the same intuitions in those instances regardless of age of onset of exposure.

Though somewhat limited, the variation in judgments across the bilingual groups suggests that age of onset of exposure may affect intuitions about grammaticality, though this is not a global effect in terms of either bilingual group or syntactic context. For instance, the data do not show that all late sequential Slovak-English bilinguals provide different judgments from their simultaneous and early sequential counterparts nor do the data show that sequential bilinguals judge switches in certain syntactic contexts differently than simultaneous bilinguals.

The naturalistic data from the Welsh-English Siarad corpus also do not demonstrate sizeable differences in the normed token means for the simultaneous, early sequential and late sequential bilinguals. While differences do exist between the simultaneous Welsh-English bilinguals and the sequential bilinguals, these differences are relatively small, though statistically significant. Further, the comparison of normed token means is a quantitative corpus analysis and does not

take qualitative issues, such as topic or length of the switch, into account, which might clarify some of the differences.

These differences in the elicited and naturalistic data do not seem to be great enough to argue for the exclusion of either early sequential or late sequential bilinguals from CS studies, though the data do show that it is necessary to take factors such as language learning history into account when analyzing and presenting CS data. Including data from sequential bilinguals, particularly late sequential bilinguals, may be necessary in the study of certain bilingual populations, as discussed below, and undoubtedly increases the scope of the data collected. Providing that researchers are clear about the source of the CS data, regardless of whether it is elicited or naturalistic, the results of this study do not suggest that there is reason to exclude early sequential and late sequential bilinguals from CS studies.

Implications for Second Language Acquisition

The exclusion of sequential bilinguals from CS studies, particularly late sequential bilinguals, has been based on CPH studies that have shown differences in performance, such as Johnson and Newport (1989). However, the data from the grammaticality judgments do not demonstrate an effect that might be attributable to a critical period in SLA. Though there are differences among the three bilingual groups in responses to the judgment tasks, these differences are restricted to specific syntactic contexts and are not consistent within the bilingual groups, offering further evidence that a strict interpretation of the CPH, where

critical period effects would be pronounced and universal in all cases of SLA, is not viable. The Slovak-English grammaticality judgment data are not robust enough to indicate whether parameter settings have been imported from FLA (Herschensohn, 2000) or reset during SLA (Epstein, Flynn, & Marthardjono, 1998). However, further syntactic analysis would show whether some of this variation in the judgment data might be attributable to cross-linguistic influence in interface conditions, as demonstrated by Serratice, Sorace, and Paoli (2004), Sorace (2004), and others.

In addition, the data regarding age of onset can only be considered exploratory at best. In the case of both the Slovak-English CS judgment data and the data from the Siarad corpus, it is likely that age of onset represents some other factor that affects CS. For instance, participants from the Siarad corpus were educated in a variety of bilingual education programs, which are closely related to age of acquisition. In this case, it is possible that the type of education program affects patterns in the use of English and mixed tokens. Further, neither study accounts for different contexts of exposure, for example whether learning English as a foreign language in school is different from learning English as a second language in an English-medium classroom. Factors such as these may also affect CS patterns and may be related to age of acquisition or age of onset of exposure because of the onset age of these events.

Implications for Research Methods in Codeswitching

The Slovak-English grammaticality judgment study and the Siarad corpus sub-study have highlighted several research method considerations in the study of CS. The contrast in the data from the grammaticality judgments and the Siarad corpus illustrate the viability of both naturalistic and elicited data, and the judgment data further show how task type contributes to understanding elicited data. Finally, the Slovak-English study emphasized issues related to studying smaller, non-traditional bilingual populations.

Naturalistic versus Elicited Data

Both naturalistic and elicited data were analyzed for this study, and both types of data contributed information about different aspects of CS across simultaneous, early sequential, and late sequential bilinguals. Though CS researchers such as Mahootian and Santorini (1996) and Myers-Scotton (2006) have argued that naturalistic data is more representative of CS than elicited data, particularly grammaticality judgments, this study has shown that both types of data can be used in complimentary analyses. The use of elicited data allowed for an in-depth analysis of variance in grammaticality judgments across bilingual groups, which has been complimented by the broader perspective offered by the analysis of mean tokens in the naturalistic corpus data. Further, the grammaticality judgments provide negative evidence, as discussed in detail in MacSwan and McAlister (2010).

In exploring potential differences in CS patterns, whether intuitions about grammaticality or actual CS, the naturalistic and elicited data both show that there are differences across bilingual groups, though these differences are relatively small. The elicited data show that the bilingual groups had similar grammatical judgments for roughly three-quarters of the CS tasks, and the corpus analysis showed that the use of English and mixed tokens among simultaneous bilinguals was only slightly larger in real terms. It is interesting to note that analyses of both datasets, though from different bilingual populations, illustrate that the differences among simultaneous, early sequential, and late sequential bilinguals were small.

In this study, both naturalistic and elicited data provided specific details about differences in CS patterns across bilingual groups, which demonstrates that both types of data can be successfully used in conjunction with each other. The field of CS would benefit from more studies that use both naturalistic and elicited data to answer questions about grammaticality, patterns of use, and other related directions in CS research. Though particular types of data may be better suited to answering some research questions, this does not warrant the general exclusion of either naturalistic or elicited data.

Type of Judgment Task

One of the more interesting findings of the Slovak-English grammaticality judgment study relates to the type of judgment task employed in CS studies involving grammaticality judgments. The Slovak-English CS survey was comprised of two types of grammaticality judgment. The traditional judgment

task, asking participants to indicate the grammaticality of the prompt on a Likert scale ranging from acceptable to unacceptable, did not produce uniform responses. In fact, for participants in the Slovak-English study, consensus was only reached once, in (58) repeated below.

(58) *Prečo ne-nakupuj-eš v* Polish store?
why NEG-shop-2.S in Polish store
'why don't you shop in the Polish store?'

In this case, all participants found (58) acceptable; however, participants did not agree on the acceptability of the related switch (59), repeated below, where only 67% of participants felt that the switch was acceptable.

(59) *Prečo ne-nakupuj-eš v* the Polish store?
why NEG-shop-2.S in the Polish store
'why don't you shop in the Polish store?'

The data indicate that both (58) and (59) are grammatical, given that the majority of participants across all groups found both switches to be acceptable when judged in isolation, though (59) is arguable slightly less acceptable.

In contrast, the associated ranking task for (58) and (59) demonstrated an overwhelming preference for (58), with 97% of participants preferring (58) over (59). This suggests that (58) is more grammatically acceptable than (59), despite 67% of participants indicating that (59) was grammatically acceptable. Though participants may have been willing to accept (59), their responses show that they felt that (58) sounded better.

This pattern was repeated in other ranking tasks as well. In most ranking tasks, participants indicated a strong preference for one switch pattern, even though the majority had found both switches acceptable when presented in isolation. In addition, the unacceptability of switches was maintained in ranking tasks where participants had negatively judged the switches presented in isolation. Specifically, the late sequential bilingual group generally found (46) and (47), repeated below, unacceptable when the switches were presented independently.

(46) What's so important about a *ryb-u*?

what's so important about a fish-F.ACC

(47) What's so important about a *ryb-a*?

what's so important about a fish-F.NOM

Further, when (46) and (47) were presented as a ranking task, 52% of the late sequential bilinguals indicated a preference for neither. Though this is slightly less than the 88% of the late sequential bilinguals who found (46) unacceptable and the 67% who found (47) unacceptable, it still demonstrates that most of the participants were consistent in their negative judgments, at least in the case of this ranking task.

The ranking tasks are useful for clarifying the judgments of grammatically related switches, as presented in this study. For instance, though participants found both switches with an English determiner and without an English determiner acceptable, the ranking tasks demonstrate that switches without an

English determiner, such as (58) and (60), are likely grammatical. The contrast between the results of the ranking task and the results from the switches presented in isolation also demonstrates that participants will indicate that some switches are acceptable, even if they find other switches more acceptable.

Finally, the ranking tasks in this study were dichotomous, though it would have been possible to present more than two switches in a task. In particular, increasing the number of switches in a ranking task may provide more insight into participant preferences when exploring constraints on word order or the presence of determiners. Ranking tasks might also be employed to investigate participant preferences in larger sets of switches or in cases where lexical factors may affect judgments, such as in idioms. Regardless of the number of switches involved, ranking tasks provide insight into both intuitions about grammaticality and preferences in CS.

Size of Bilingual Population

This study has highlighted a few of the issues of working with a small population such as Slovak-English bilinguals. The number of Slovak speakers world wide is estimated to be less than six million (Slovak, n.d.), and a much smaller percentage of those speakers are Slovak-English bilingual. The majority of these bilinguals are bilingual for im/migration reasons, and data from the demographic survey of the study show that the bilingual population itself can be transient, especially within the EU.

Imposing rigid criteria of bilingualism, as in the case of simultaneous bilingualism, does not capture the nature of bilingualism in this population. The majority of Slovak-English bilinguals, excluding those whose English ability is due almost exclusively to formal language learning, are sequential bilinguals. Within this group, the majority have actually become bilingual later in life and go on to raise families where the children are predominantly early sequential bilinguals.

There is a noticeable lack of simultaneous Slovak-English bilinguals in this study. It seems that children raised in Slovak-English speaking households will become, for all intents and purposes, English monolinguals, especially if they are raised in English-speaking countries. In my search for simultaneous bilinguals for this study, I encountered this over and over, where the children did not speak Slovak, despite the parents' efforts to encourage the development of their children's Slovak.

While this illustrates the pressure English exerts on minority languages, particularly in one parent- one language families, this also has a direct effect on the study of certain language pairs in CS. If simultaneous bilinguals are considered to be the most reliable sources of CS data and judgments, the question remains as to what to do in the case of language pairs where the simultaneous bilinguals are not actually bilingual. In other words, it is likely that certain bilingual populations, such as Slovak-English speakers, do not have an

appreciable number of simultaneous bilinguals, and those who are simultaneous bilinguals are likely to be very dominant in English.

In these cases, researchers must decide how to approach the CS data from sequential bilinguals. In particular, researchers need to clearly outline the language background of the participants and develop an analysis that accounts for age of onset of exposure. A general assessment of proficiency would also be useful, although this is not always feasible or necessary. In the case of this study, it was assumed that participants who could read and respond to the demographic and attitudinal surveys were proficient in English, and personal contact with the participants also aided in determining proficiency. Once language history profiles of participants have been established, it is then possible to reliably analyze CS data from sequential bilinguals.

Arguably, the most reliable source of data from a theoretical point of view would be data from what few simultaneous bilinguals might exist. However, if the simultaneous bilinguals are few and dominant in one language, while the sequential bilinguals are more numerous and more balanced, as in the Slovak-English bilingual population, then the question becomes whether the data from simultaneous bilinguals actually represent Slovak-English CS in its entirety. In other words, to what extent do the data from a limited number of bilinguals accurately represent all CS data in the population in question? Further, and more specific to this study, is it possible or even desirable to argue that the grammaticality judgments of a smaller group of simultaneous bilinguals represent

grammatical CS more accurately than those from a larger group of sequential bilinguals?

The results of the Slovak-English grammaticality study suggest that limiting study participants to simultaneous bilinguals would have accomplished little beyond severely restricting the size of the participant group. The inclusion of early sequential and late sequential bilinguals increases the sample size, and the variance in judgments, when present, highlights interesting contrasts. For instance, it is apparent from the judgment data that late sequential bilinguals tended to be less willing to find switches acceptable, as in switches (67) – (71), which explored switching in a progressive auxiliary construction. Further research might explore why late sequential bilinguals in general were more likely to provide negative judgments in this context and which syntactic analyses might be able to account for the ungrammaticality of those switches. Accordingly, including both simultaneous and sequential bilinguals in CS studies highlights aspects of CS that might not be as apparent in more homogenous simultaneous bilingual samples.

Educational Implications

Despite the focus of this study on issues in CS and SLA, the study also has implications for the education of bilingual students, particularly early sequential bilinguals and, to some extent, late sequential bilinguals. Above all, the Siarad corpus study has shown that all bilinguals engage in CS, although the amount may vary across individuals and bilingual groups. Further, the Slovak-English

judgment data show that simultaneous, early sequential, and late sequential bilinguals have similar intuitions about many of the switches. Though their judgments may have differed in some judgment tasks, the results show that these differences are limited to specific syntactic contexts.

The data from this study show that bilinguals, regardless of when they became bilingual, engage in and are able to judge codeswitching. While CS may act as a form of bootstrapping during SLA (Bhatia & Ritchie, 1996, 1998; Rubin & Toribio, 1996), it also seems to transition to a normal language practice among sequential bilinguals, echoing findings in Poplack (1980) and Zentella (1997). Together, these findings support the recommendation that CS is not only a natural part of being bilingual, but also be an integral part of a bilingual classroom (Butzkamm, 1996; Martin, 1999, 2003; Muller & Baetens Beardsmore, 2004; Ncocko, Osman, & Cockcroft, 2000; and others). The data from this study show that even late sequential bilinguals are generally able to identify switches as ungrammatical and are even more likely to find switches in specific contexts unacceptable than simultaneous and early sequential bilinguals. Therefore, if sequential bilinguals also codeswitch, though perhaps not as much as simultaneous bilinguals, then there is little need to worry that listening to others codeswitch might somehow corrupt or encourage sequential bilinguals to codeswitch.

Limitations and Further Research

There are several shortcomings in both the Slovak-English grammaticality judgment study and the Welsh-English Siarad corpus study, and both studies present questions that warrant further investigation.

Further Directions for the Slovak-English Study

The findings of the Slovak-English grammaticality judgment study are limited most obviously by the size of the sample, and in particular the size of the simultaneous bilingual group. The study would greatly benefit from a larger sample size, which may indicate larger differences among the three bilingual groups. A larger sample might also resolve some of the validity issues with the chi square tests of independence, which generally had a large number of cells with an expected frequency of less than five.

Additionally, the study would benefit from more ranking tasks in order to contextualize results from the traditional judgment tasks. The results of the ranking tasks, as discussed above, tended to provide clearer indications of grammaticality than the traditional judgment tasks, which presented the switches in isolation. In particular, the tasks involving word order might be more informative if data about preferences in word order, elicited through a larger ranking task, were available.

In compliment to the traditional judgment tasks and the ranking tasks, a focus group for each of the bilingual groups might provide qualitative feedback

on specific switches and contexts where the participants were in disagreement about the acceptability of a switch. Focus groups, as used by MacSwan (1999), would offer a venue for exploring the reasons for negative judgments and how participants might rephrase a negatively judged switch to make it more acceptable. Finally, focus groups might also allow participants to provide open-ended feedback on the tasks, particularly in terms of how attitudes towards CS might affect grammaticality judgments.

Replicating this study with other bilingual populations would lead to further insight into differences among simultaneous, early sequential, and late sequential bilinguals. Specifically, a similar study in a larger, more stable bilingual population such as that in Northwest Wales would provide opportunities to explore the roles of a variety of factors in grammatical intuitions about CS. This type of study could also investigate the role of education in CS, particularly as it relates to age of onset of exposure and age of acquisition.

Finally, in-depth syntactic analyses of the Slovak-English switches would greatly contribute to existent data on CS and SLA, particularly within the Minimalist framework. A Minimalist analysis of the switches would offer more than a descriptive account of Slovak-English CS, and would further on-going discussions about the nature CS. Lastly, contrastive analyses of switches where the bilingual groups disagreed might offer new directions in exploring how early and late sequential bilinguals differ from simultaneous bilinguals in abstract representations of language.

Further Directions for the Welsh-English Study

The analysis of the Welsh-English Siarad corpus data does show that simultaneous bilinguals use slightly more English and mixed tokens than early and late sequential bilinguals. As quantitative analysis of the corpus data only indicates the quantity of tokens, a qualitative investigation of the English and mixed tokens would offer more insight into further potential differences among the bilingual groups. For instance, analyzing the length of the switch would indicate whether most switches were one word switches or longer. Further syntactic analysis would also indicate whether age of acquisition has an effect on the structure of a participant's codeswitches.

Additionally, creating a subsample of the corpus for the purposes of syntactic analyses could capture how Welsh-English bilinguals produce mixed speech at a morphosyntactic level. Within a Minimalist framework, the CS data could be used to further explore the syntax of Welsh and English and offer insight into the structure of each language. Finally, the data could also be investigated for trends in borrowing, particularly nonce borrowing, and similar language contact issues.

Finally, the current analysis does not take factors such as language of education into account. Given the relationship between the age boundaries for early and late sequential bilingualism and the start of elementary and secondary education, exploring the effects of language of education and bilingual education programs on token means and language structure might offer new insights into the

relationship between language and schooling. McAlister and Lloyd (2009) similarly concluded that neither age of onset of acquisition nor chronological age was a precise enough variable to explain the variation in normed token means in the corpus data, and felt that schooling was perhaps a stronger predictor. The size of the corpus and the detail of the accompanying demographic data support these and other investigations, indicating that the Siarad corpus may be able to address any number of research questions related to language contact phenomena.

Summary

This dissertation has investigated the effect of age of onset of exposure in grammaticality judgments of Slovak-English CS and the effect of age of acquisition in normed token means in the Welsh-English Siarad corpus. Though the data show some differences across simultaneous, early sequential, and late sequential bilinguals, there are also overwhelming similarities among the bilinguals, particularly in the grammaticality judgment data. The grammaticality judgment study has shown that early and late sequential bilinguals tend to share the same intuitions about Slovak-English CS as simultaneous bilinguals. The Welsh-English corpus data have demonstrated that simultaneous bilinguals in the corpus use slightly more English and mixed tokens than the early sequential and late sequential bilinguals, though these differences are relatively small. The two studies have also highlighted several new directions for research, including replicating the grammaticality judgment study in a larger bilingual population, extending the corpus study to include educational factors and syntactic analyses,

and analyzing the grammaticality judgment data from a Minimalist perspective in order to inform generative approaches to CS and SLA.

In conclusion, this dissertation has demonstrated that the participants in the two samples did not provide substantial evidence for differences in CS patterns attributable to age of onset of exposure or acquisition. Based on these observations, late and early sequential bilinguals can be included in CS studies as long as researchers are candid about the language history of participants. The inclusion of both simultaneous and sequential bilinguals in CS studies allows the language pairs of smaller bilingual populations to be studied and offers insight into differences in simultaneous and sequential bilinguals that may inform FLA and SLA. It is my hope that this dissertation has moved the conversation in CS studies from whether data from sequential bilinguals is viable enough to include in the study of CS to how sequential bilinguals differ from simultaneous bilinguals in CS and how this informs the fields of CS and language acquisition.

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APPENDIX A
SURVEY – INFORMED CONSENT

Informed Consent

I am a student in the Department of Curriculum & Instruction in the Mary Lou Fulton College of Education at Arizona State University. I am conducting a research study in fulfillment of my dissertation, and I would like to invite you to participate in this study. The purpose of the study is to explore the relationship between the age you started learning English and how you feel about different kinds of language mixing.

Your participation will involve filling out both a survey of demographic information and a survey of test sentences. At the end of the surveys, you will be eligible to enter a raffle for one of two £50 gift certificates to Marks and Spencers. Your name and contact information will not be connected in anyway with your responses to the surveys.

It will take no longer than thirty minutes to fill out the surveys. This study is anonymous; so your results will by analyzed only by the researcher, and your name will not be used in discussions of the data. Your performance on this activity will be kept strictly confidential, and any publication or presentation on the results of this study will only refer to participants by number or as an entire group.

You must be 18 years or older to participate in this survey. There are no potential benefits to the individual subject or others as a result of participating in this study. There are also no risks associated with this activity. If you feel uncomfortable at any time during the surveys, please feel free to take a break. Your participation in this study is voluntary, and you may withdraw from the activity at any time.

If you have any questions concerning the research study, please email me at kara.mcalister@asu.edu or call me at 0753 089 0905.

If you accept these conditions, please click the "I accept" button below to start the survey.

APPENDIX B

SURVEY - DEMOGRAPHIC INFORMATION

1.) What is your gender?
    a. Male
    b. Female

2.) What year were you born?

3.) What is your postal code?

4.) What is your occupation?

5.) What is the highest level of education that you have completed?
    a. Secondary School
    b. Post-Secondary Training
    c. Some University
    d. University
    e. Post Graduate

6.) Where were you born? (Please indicate city and country)

7.) How long have you lived in an English-speaking country? (Please indicate years and months)

8.) What language(s) do you use at work?
    a. English
    b. Both English and Slovak
    c. Slovak
    d. Other

9.) What language(s) do you use with the people you live with?
    a. English
    b. Both English and Slovak
    c. Slovak
    d. Other

10.) What language(s) do you use with your friends?
   a. English
   b. Slovak
   c. Both English and Slovak
   d. Other

11.) What language(s) does your mother speak to you?
   a. English
   b. Slovak
   c. Both English and Slovak
   d. Other

12.) What language(s) do you speak to your mother?
   a. English
   b. Slovak
   c. Both English and Slovak
   d. Other

13.) What language(s) does your father speak to you?
   a. English
   b. Slovak
   c. Both English and Slovak
   d. Other

14.) What language(s) do you speak to your father?
   a. English
   b. Slovak
   c. Both English and Slovak
   d. Other

15.) Generally, what language(s) do you speak with your family members?
   a. English
   b. Slovak
   c. Both English and Slovak
   d. Other

16.) If you have children, what language(s) do you speak with them?
   a. not applicable
   b. English
   c. Slovak
   d. Both English and Slovak
   e. Other

17.) Where did you go to primary school? (city, country)

18.) What language(s) did the teachers speak ? (Please do not include language classes)
   a. English
   b. Slovak
   c. Both English and Slovak
   d. Other

19.) What language(s) did you speak at primary school? (Please do not include language classes)
   a. English
   b. Slovak
   c. Both English and Slovak
   d. Other

20.) Where did you go to secondary school? (city, country)

21.) What language(s) did the teachers speak? (Please do not include language classes)
   a. English
   b. Slovak
   c. Both English and Slovak
   d. Other

22.) What language(s) did you speak in secondary school? (Please do not include language classes)
   a. English
   b. Slovak

c. Both English and Slovak
d. Other

23.) If you did post-secondary training or went to university, where was it? (city, country)

24.) What language(s) did the instructors speak?
a. English
b. Slovak
c. Both English and Slovak
d. Other

25.) What language(s) did you use during post-secondary training or university?
a. English
b. Slovak
c. Both English and Slovak
d. Other

26.) In the last year, how many times have you traveled to Slovakia?
a. None
b. Once
c. Twice
d. Three times
e. Four times
f. More than four times

27.) If none, when was the last time you were in Slovakia?

28.) How old were when you started learning English?

APPENDIX C

SURVEY-GRAMMATICALITY JUDGMENTS

Below are sentences in Slovak. Some of them will sound correct, like something someone would say in a conversation, and others will sound wrong. Please select what you think. It is best to go with your first reaction, rather than thinking about it for a long time. The statement, "Sounds odd, but it's probably okay," is for sentences that are not exactly correct, but are not wrong either. The statement, "Sounds odd and is likely wrong" are for sentences that don't sound completely wrong, but are still wrong.

You will also be asked to do the same thing with a series of English sentences after you have completed the Slovak ones.

Priming 1

1.) Mám chuť na niečo sladké
    a. Sounds fine
    b. Sounds odd, but it's probably okay
    c. Sounds odd and is likely wrong
    d. Sounds wrong

2.) Po daždi vyšlo slnko
    a. Sounds fine
    b. Sounds odd, but it's probably okay
    c. Sounds odd and is likely wrong
    d. Sounds wrong

3.) ťa som potešilo sa veľmi
    a. Sounds fine
    b. Sounds odd, but it's probably okay
    c. Sounds odd and is likely wrong
    d. Sounds wrong

4.) Malé chlapec behať po lúka
    a. Sounds fine
    b. Sounds odd, but it's probably okay
    c. Sounds odd and is likely wrong
    d. Sounds wrong

5.) Povedal by som že niekedy skutočne
    a. Sounds fine
    b. Sounds odd, but it's probably okay
    c. Sounds odd and is likely wrong
    d. Sounds wrong

Priming 2

6.) I went to the store yesterday
    a. Sounds fine
    b. Sounds odd, but it's probably okay
    c. Sounds odd and is likely wrong
    d. Sounds wrong

7.) The Central line goes through Oxford Circus
    a. Sounds fine
    b. Sounds odd, but it's probably okay
    c. Sounds odd and is likely wrong
    d. Sounds wrong

8.) We yesterday has eaten five times
    a. Sounds fine
    b. Sounds odd, but it's probably okay
    c. Sounds odd and is likely wrong
    d. Sounds wrong

9.) John gave pictures of each other to the kids.
    a. Sounds fine
    b. Sounds odd, but it's probably okay
    c. Sounds odd and is likely wrong
    d. Sounds wrong

Below are sentences where Slovak and English are mixed together. As with the sentences you just completed, you will be asked if you think a sentence sounds correct. Please try to go with your first reaction, as there are no right or wrong answers here.

You may notice that some of the sentences repeat themselves. Please do not try to remember what you answered previously, but instead indicate what your first reaction is.

This survey may take quite a long time to load. Please be patient and do not hit "refresh".

Initial Code Switching Judgments

10.) *Ona* has decided to travel *domov*
   a. Sounds fine
   b. Sounds odd, but it's probably okay
   c. Sounds odd and is likely wrong
   d. Sounds wrong

11.) *Ona* has decided to travel *domov*
   a. Sounds fine
   b. Sounds odd, but it's probably okay
   c. Sounds odd and is likely wrong
   d. Sounds wrong

12.) She has decided to travel *domov*
   a. Sounds fine
   b. Sounds odd, but it's probably okay
   c. Sounds odd and is likely wrong
   d. Sounds wrong

13.) She has decided to travel *domov*
   a. Sounds fine
   b. Sounds odd, but it's probably okay
   c. Sounds odd and is likely wrong

d. Sounds wrong

14.) The fox was wild, but it *jedla z mojej ruky*
a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

15.) The fox was wild, but it *jedla z mojej ruky*
a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

16.) The fox was wild, but *jedla z mojej ruky*
a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

17.) The fox was wild, but *jedla z mojej ruky*
a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

18.) We *sme chceli pozerať* Champions League
a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

19.) We *sme chceli pozerať* Champions League
a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

20.) I *mám rada* beans on toast

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

21.) I *mám rada* beans on toast

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

22.) *Mám rada* beans on toast

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

23.) *Mám rada* beans on toast

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

<u>Main Code Switching Grammaticality Judgments</u>

24.) *Uhrýzol ťa* the dog?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

25.) *Uhrýzol ťa* the dog?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

26.) The cat *poškrabala ho na nohe*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

27.) The cat *poškrabala ho na nohe*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

28.) The cat *ho poškrabala na nohe*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

29.) The cat *ho poškrabala na nohe*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

30.) *Poškrabala ho* the cat *na nohe*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

31.) *Poškrabala ho* the cat *na nohe*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

32.) What's so important about a *rybu*?
   a. Sounds fine
   b. Sounds odd, but it's probably okay
   c. Sounds odd and is likely wrong
   d. Sounds wrong

33.) What's so important about a *rybu*?
   a. Sounds fine
   b. Sounds odd, but it's probably okay
   c. Sounds odd and is likely wrong
   d. Sounds wrong

34.) What's so important about a *ryba*?
   a. Sounds fine
   b. Sounds odd, but it's probably okay
   c. Sounds odd and is likely wrong
   d. Sounds wrong

35.) What's so important about a *ryba*?
   a. Sounds fine
   b. Sounds odd, but it's probably okay
   c. Sounds odd and is likely wrong
   d. Sounds wrong

36.) Yesterday I went *autobusom*, but today I took the train
   a. Sounds fine
   b. Sounds odd, but it's probably okay
   c. Sounds odd and is likely wrong
   d. Sounds wrong

37.) Yesterday I went *autobusom*, but today I took the train
   a. Sounds fine
   b. Sounds odd, but it's probably okay
   c. Sounds odd and is likely wrong
   d. Sounds wrong

38.) I took the *psa na prechádzku*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

39.) I took the *psa na prechádzku*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

40.) *Videl som* the American bloke *včera na omši*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

41.) *Videl som* the American bloke *včera na omši*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

42.) *Musel som krmiť* my neighbor's fish *cez víkend*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

43.) *Musel som krmiť* my neighbor's fish *cez víkend*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

44.) We spent summer holidays *u babky*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

45.) We spent summer holidays *u babky*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

46.) We celebrated Christmas at *babky*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

47.) We celebrated Christmas at *babky*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

48.) We wanted to go *do kina, ale nehrali nič zaujímavé*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

49.) We wanted to go *do kina, ale nehrali nič zaujímavé*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

50.) *Čo by si chcel* for breakfast?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

51.) *Čo by si chcel* for breakfast?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

52.) *Čo by si chcel na* breakfast?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

53.) *Čo by si chcel na* breakfast?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

54.) *Čo by si chcel na* breakfast today?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

55.) *Čo by si chcel na* breakfast today?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

56.) *Prečo nenakupuješ v* Polish store?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

57.) *Prečo nenakupuješ v* Polish store?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

58.) *Prečo nenakupuješ v* the Polish store?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

59.) *Prečo nenakupuješ v* the Polish store?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

60.) *Môj brat ma auto s* full dual exhaust kit

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

61.) *Môj brat ma auto s* full dual exhaust kit

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

62.) *Môj brat ma auto s* the full dual exhaust kit

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

63.) *Môj brat ma auto s* the full dual exhaust kit

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

64.) *Budeme* travel to Brighton?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

65.) *Budeme* travel to Brighton?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

66.) *Chcete* drink wine *alebo* beer?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

67.) *Chcete* drink wine *alebo* beer?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

68.) *Možeme* finish the presentation *dnes*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

69.) *Možeme* finish the presentation *dnes*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

70.) *Mohli by sme* finish watching the movie?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

71.) *Mohli by sme* finish watching the movie?

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

72.) *Trošku bola* bleeding

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

73.) *Trošku bola* bleeding

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

74.) *Bol som tri hodiny* chatting *s kamarátom vo Švédsku*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

75.) *Bol som tri hodiny* chatting *s kamaratom vo Švedsku*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

76.) *Je* speaking with his brother

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

77.) *Je* speaking with his brother

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

78.) *Je* speaking *so svojím bratom*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

79.) *Je* speaking *so svojím bratom*

a. Sounds fine
b. Sounds odd, but it's probably okay
c. Sounds odd and is likely wrong
d. Sounds wrong

80.) *Si* chatting *na Facebooku*?
   a. Sounds fine
   b. Sounds odd, but it's probably okay
   c. Sounds odd and is likely wrong
   d. Sounds wrong

81.) *Si* chatting *na Facebooku*?
   a. Sounds fine
   b. Sounds odd, but it's probably okay
   c. Sounds odd and is likely wrong
   d. Sounds wrong

82.) Chatting *si na Facebooku*?
   a. Sounds fine
   b. Sounds odd, but it's probably okay
   c. Sounds odd and is likely wrong
   d. Sounds wrong

83.) Chatting *si na Facebooku*?
   a. Sounds fine
   b. Sounds odd, but it's probably okay
   c. Sounds odd and is likely wrong
   d. Sounds wrong

Initial Ranking

For this part of the survey, you will just need to choose which sentence sounds better to you. If neither one of them sounds okay, then please click the "Neither" button.

84.) Please indicate which sentence sounds better.
   a. *Ona* has decided to travel *domov*
   b. She has decided to travel *domov*
   c. Neither

85.) Please indicate which sentence sounds better.
   a. The fox was wild, but it *jedla z mojej ruky*
   b. The fox was wild, but *jedla z mojej ruky*
   c. Neither

86.) Please indicate which sentence sounds better.

a. *Mám rada* beans on toast
b. I *mám rada* beans on toast
c. Neither

Main Ranking

87.) Please indicate which sentence sounds better.

a. *Prečo nenakupuješ v* Polish store?
b. *Prečo nenakupuješ v* the Polish store?
c. Neither

88.) Please indicate which sentence sounds better.

a. *Môj brat ma auto s* full dual exhaust kit
b. *Môj brat ma auto s* the full dual exhaust kit
c. Neither

89.) Please indicate which sentence sounds better.

a. *Čo by si chcel* for breakfast?
b. *Čo by si chcel na* breakfast?
c. Neither

90.) Please indicate which sentence sounds better.

a. We celebrated Christmas at *babky*
b. We spent summer holidays u *babky*
c. Neither

91.) Please indicate which sentence sounds better.

a. The cat *ho poškrabala na nohe*
b. The cat *poškrabala ho na nohe*
c. Neither

92.) Please indicate which sentence sounds better.

a. What's so important about a *rybu*?
b. What's so important about a *ryba*?
c. Neither

APPENDIX D

SURVEY-ATTITUDES

Attitudes

You are almost to the end of the survey. This last bit is just a few questions about your attitudes towards mixing Slovak and English.

1.) How do you feel about mixing Slovak and English?
   a. It is always okay to mix Slovak and English together
   b. It depends on who I am speaking with
   c. It is never okay to mix Slovak and English

2.) If you mix Slovak and English, who are you most likely talking to?
   a. Anyone who speaks both Slovak and English
   b. My friends
   c. My family
   d. My work colleagues
   e. No one, I don't mix Slovak and English

3.) What do you think when you hear someone mixing Slovak and English?

4.) Do you occasionally comment about someone else who mixes Slovak and English?
   a. Yes, because it sounds like they have forgotten how to speak Slovak
   b. Sometimes, if they should know the word in Slovak
   c. Yes, because it sounds funny
   d. No, because I rarely notice when someone is mixing
   e. No, because it would be rude to say anything

5.) Who do you think is most likely to mix Slovak and English?

6.) When you are at home, which languages do you think should be used?
   a. Slovak only
   b. English only
   c. both Slovak and English, but mixing is not okay
   d. both Slovak and English, and mixing is okay

7.) When you are at work, which languages do you think should be used?
    a. Slovak only
    b. English only
    c. both Slovak and English, but mixing is not okay
    d. both Slovak and English, and mixing is okay

8.) When you are with your Slovak-speaking friends, which languages do you think should be used?
    a. Slovak only
    b. English only
    c. both Slovak and English, but mixing is not okay
    d. both Slovak and English, and mixing is okay

Final Thank You

Thank you for participating in my survey. I would like to confirm that your answers will remain anonymous and secure. If you have any questions or concerns, please feel free to contact me at kara.mcalister@asu.edu.

If you are interested in entering the raffle for one of two £50 gift certificates to Marks and Spencers, please click on the link below.

http://qshare.qualtrics.com/SE?SID=SV_bxwYEDiAF8BaiBC&SVID=Prod

Once again, I thank you for your time and willingness to complete this survey.

Best,

Kara T. McAlister

Doctoral Candidate

Arizona State University

APPENDIX E

IRB APPROVAL

ARIZONA STATE UNIVERSITY

Research Compliance Office
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(480) 965-6788
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To:	Jeffrey Macswan ED
From:	Mark Roosa, Chair Soc Beh IRB
Date:	06/25/2008
Committee Action:	**Exemption Granted**
IRB Action Date:	06/25/2008
IRB Protocol #:	0806003042
Study Title:	Age of Onset Effects in Slovak-English Code Switching

The above-referenced protocol is considered exempt after review by the Institutional Review Board pursuant to Federal regulations, 45 CFR Part 46.101(b)(2) .

This part of the federal regulations requires that the information be recorded by investigators in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. It is necessary that the information obtained not be such that if disclosed outside the research, it could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

You should retain a copy of this letter for your records.

APPENDIX F

LIST OF ABBREVIATIONS

Abbreviations Used (Max Planck Institute for Evolutionary Anthropology, 2010)	
1	First person
2	Second person
3	Third person
ACC	Accusative
AUX	Auxiliary
COND	Conditional
COP	Copula
DAT	Dative
DEM	Demonstrative
DET	Determiner
F	Feminine
FUT	Future
GEN	Genitive
INF	Infinitive
INS	Instrumental
LOC	Locative
M	Masculine
N	Neuter
NEG	Negative

NOM	Nominative
PL	Plural
POSS	Possessive
pro	Null pronoun
PROG	Progressive
PRS	Present
PST	Past
REFL	Reflexive
S	Singular