CONVERSATIONAL CODE-SWITCHING IN AUTOBIOGRAPHICAL MEMORIES

CONVERSATIONAL CODE-SWITCHING IN AUTOBIOGRAPHICAL MEMORIES
BY
ITALIAN IMMIGRANTS

By

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Abstract

Conversational code-switching is common among bilingual speakers, in fact, we consider this routine; however, the reasons for switching and the location of this mechanism in the brain remain largely unknown. There is much to be discovered about bilingual code-switching especially in relation to autobiographical memories shared between immigrants. This study investigates the two phenomena: code-switching and autobiographical memories. The research is based on the following major theories: 1) Schrauf (2009) who said that one's "…particular personal memories are associated with one or the other of the bilingual's languages" (p. 26), which he called the *language-specificity effect*; 2) Marian & Neisser (2000) who proposed that "…memories become more accessible when language at retrieval matches language at encoding…any increase in the similarity between the linguistic environments at encoding and at retrieval should facilitate recall" (p. 361); 3) Marian & Kaushanskaya (2005), who found that "…bilinguals are more likely to code-switch to the other language when the language of encoding does not match the language of retrieval" (p. 1483). The results of this study both supported and disproved the above mentioned research, which indicate that language alone may not be the only influence on autobiographical memory recall or code-switching in elderly bilinguals. It is my belief that both phenomena stem from a higher process that is involved with cognitive control and located in the cingulate gyrus, one part of the limbic system.

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1   Introduction

The *'scambio'* (i.e. exchange) of Furlan[1] and English has always been part of my life. Growing up in Canada with Italian immigrant parents, I often heard the mixing and switching of these languages during conversations between them, my aunts/uncles and other Italian immigrants that frequently visited. It was common to hear sayings like

> S: **yeah** *parcè che ha vevin la buna volontât*
> I: *sì sì*
> S: *jère* **a matter of surviving** *che agns là*
>
> S: **yeah** because they had good intentions
> I: yes, yes
> S: it was **a matter of surviving** in those years (Fur-A-S & Fur-A-I)[2]

Not realizing then, that this switching or changing of languages was a phenomenon commonly known as 'code-switching' and that it would become of great interest to me years later, I now realize that what I used to perceive as one language is a lot easier 'done' than 'said'. It seems as though it is easier for bilinguals to code-switch during conversations than to explain the reason for doing so. When asked 'why' particular words/phrases are switched in conversation the common response is often "I don't know, it's what came out first" (Fur-A-S & Fur-A-I). This phenomenon of code-switching is common in bilingual discourse; however, defining the term 'bilingualism' is far from simple.

It begins with the question of what is a 'bilingual'. Moreover, does true bilingualism exist? Throughout the years linguists have used this term to represent competencies ranging from (broadly) the alternate use of two languages (Weinreich, 1964) to having specific skills in reading, writing, listening, and speaking (Macnamara, 1969). Wei (2008) used the term 'multilingual' alongside 'bilingual' to mean "anyone who can communicate

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[1] The name of this language is known as Furlan (in Furlan), Friulano (in Italian), and Friulian (in English). I will use the Furlan pronunciation of this language throughout the paper.

[2] This passage was taken from the conversation between participants S and I in the 'Furlan' group.

in more than one language" (p. 4). The range of abilities that are described under this term makes it difficult to formulate theories about the concept.

Also difficult to define is the term code-switching as there are variations in the way in which the term is used. Its referent has changed over the years from *interference* (Weinreich, 1964), to *code-mixing* (Muysken, 2000) to *transference* (Clyne, 2003), to *language alternation* (Gafaranga, 2008), causing inconsistency in terminology, which continues to be problematic for theory development in this field. Troublesome too is the concept of '*code*' in the term code-switching. What exactly does 'code' refer to? Does it reflect tone or stress differences? Does it include or exclude turn taking discourse markers and register? Is 'code' universal or language specific? At what linguistic level do we analyze conversational code-switching? The problems of inconsistency is also found in the spelling of code-switching as some authors hyphenate the words '*code-switching*' (Gumperz, Gardner-Chloros, Myers-Scotton) others space the words '*code switching*' (MacSwan, Nilep), while others combine the words '*codeswitching*' (Jacobson, Dussias). Although this difference may seem trivial, it does call up different articles in on-line searches, which is perhaps more time consuming than problematic. In any case, code-switching is the crossover or switching from one language to another in bilingual discourse. In other words, when a bilingual switches languages while talking to another bilingual, we call it code-switching.

Theories about code-switching are not uniform or unanimous among linguists and range from 'random mixing' to 'syntactic constraints' (for a review see MacSwan, 1999; Nilep, 2006). Rules and models have been posited and argued by those who support their research with a range of language samples from around the world (See Clyne, 2003, Gardner-Chloros & Malcolm, 2004). Some argue that there are constraints to code-switching, others reveal there are none. Some explain it with universal tendencies, while others argue that conditions are language-specific. Despite the changes over time, we need to keep all options open. As Gardner-Chloros (2009) said, "we should continue to look at it from as many different angles as possible" (p.7). She maintains a 'common sense' approach and takes code-switching "at face value, rather than with a particular

theory as a point of departure" (p. 7). This approach, adopted also in this study, invites collaborative efforts from other disciplines, such as neuroscience, psychology, anthropology, etc. to investigate code-switching from different perspectives.

Current studies on code-switching have taken on a more scientific approach. Neurolinguists are interested in trying to discover how this phenomenon works in the human brain. Researchers continue to observe and document instances of pathological code-switching in aphasic patients, for example, in order to determine the source of language switching. Fabbro (2001), Paradis (2004), Abutalebi & Green (2007, 2008), among others, study how languages are organized or where languages are switched in the normal and pathological brain of bilinguals. The research on bilingualism and cognitive linguistics, along with other sub-disciplines (sociolinguistic, psycholinguistic and so on) contribute greatly to this complex field of study. According to Gardner-Chloros, "none of these methods on its own can provide a complete picture of behaviour as complex as code-switching" (2009, p. 8).

Another recent area of interest in the study of code-switching involves the recall of autobiographical memories. The connection between language and memory is fascinating to linguists who want to explore the intricacies of this relationship. Perhaps of greater curiosity is the relationship between memory encoding and memory recall in bilinguals biculturals, those "having or combining the cultural attitudes and customs of two nations, peoples, or ethnic groups" (Bicultural, 2012, p. 1), in order to determine if in fact, memories are language specific. An important question to ask is which language is used to retell life memories. With respect to neurocognitive studies of memory, Schrauf (2009) said that one's "…particular personal memories are associated with one or the other of the bilingual's languages" (p. 26), which he called the *language-specificity effect*. Marian & Neisser (2000) proposed that "…memories become more accessible when language at retrieval matches language at encoding…any increase in the similarity between the linguistic environments at encoding and at retrieval should facilitate recall" (p. 361). Marian & Kaushanskaya (2005) examined language interaction among Russian-English bilinguals and found that "…bilinguals are more likely to code-switch to the

other language when the language of encoding does not match the language of retrieval" (p. 1483).

The above studies became the theoretical basis for the current study. In addition, it was felt that other factors such as age of immigration, current age during study, and motivation for second language acquisition, might also determine the choice of language in recalling the participants' autobiographical memories. One crucial factor to consider is the difference between internal language recall and external language report. Some studies (Schrauf & Rubin, 1998, for example) provide evidence that older immigrants do not demonstrate the language specificity effect per se. Rather; differences were observed between the language in which the memory came to them and the language in which they used to report the memory. Larsen, Schrauf, Fromholt, & Rubin (2002) highlighted that "bilinguals may mentally retrieve a memory in one language and narrate it in another" (p. 46). This distinction between retrieval and narration was also evident in this study.

The study of code-switching is relatively unexplored in the free recall of autobiographical memories of bicultural/bilingual immigrants during natural conversations. Research on code-switching and bilingual autobiographical memories typically involve controlled experiments where participants are tested individually on memory recall, based on word prompts presented in each language separately. This may capture language specificity in bilinguals, but what it does not capture is the natural or true sense of conversational code-switching, which transpires when two or more bilinguals engage in conversation, especially when it involves the recounting of life stories. Hence, if what Schrauf (2009) says is true, that memories are tied to one or the other of the bilingual's languages, then the memories recalled in conversation should reflect this specificity effect. Early memories should be tied to the first language. If there is a mismatch in languages between the encoded memory and recounted memory, then we may expect to see instances of code-switching, as per research by Marian & Kaushanskaya (2005). The emphasis of this study is on spontaneous code-switching in normal conversation between bilingual interlocutors, in order to analyse code-switching in its truest, most natural form.

Consecutive bilingual/bicultural immigrants, those who have moved to a new country and learned a new language, are ideal candidates for research such as this since their language encoded memories are more discrete and tied to the place of origin. Schrauf & Rubin (2003) said that "immigration affords a kind of 'natural' experiment for viewing the effects of culture change on memory" (p. 121). That said, we should not find many instances of code-switching if the language used in the interview matches the language of the encoded memory. In reality, this may not be true, which brings to surface many questions. For example, why do some immigrants switch languages when recounting early memories while others do not? What triggers the switch; the topic, the interlocutors, or the setting? Does age of immigration and age at time of recall influence one's tendency to code-switch or not? Do immigrants have two linguistic sets of memories? How does language-specificity interact with language choice and code-switching in conversation?

To my knowledge, combining code-switching and autobiographical memory in natural discourse has not been done. Perhaps the relationship between them is too far-reaching, too difficult to determine in quantitative terms. Perhaps there may be overlapping results. This potential amalgamation of topics became especially interesting with regards to their location in the brain. I was curious to know if code-switching and encoding specificity were connected somehow, if perhaps they shared a similar location or network in the brain, and if the connection was conversely related. For example, would there be more code-switching if language and encoded memories mismatched?

The purpose of this study was designed to incorporate four main objectives. First, to record natural conversation in order to observe and quantify the use of Furlan and English by elderly immigrants from the Friuli region of Italy in their recounting of autobiographical memories as it relates to the encoding specificity principle. Second, to quantify and highlight the overall instances of code-switching in the recorded conversation on two levels: 1) *within* the turns of each speaker and 2) *between* the turns of both speakers combined. The third objective was to analyze and compare instances of code-switching between the following life-time periods: pre-immigration (memories from Italy), time of immigration (their voyage to Canada and the first year here), and post

immigration (memories starting after their first year in Canada). The fourth objective was to briefly investigate the frequency and use of the discourse markers (DMs) *'sì'* and '*yeah'* per group per time period.

The methodology consisted of informal video recorded interviews and Likert scale questionnaires, which rates the answers on a scale of one (never) to seven (always). The questions on the questionnaire mirrored the types of questions asked during the interview in order to compare the actual use of language to reported frequency use. I was curious to see whether there was a match or mismatch between actual use versus reported use of Furlan and English. Both the interview and the questionnaire provided valuable qualitative and quantitative data on code-switching and conversational discourse. The data from this research will be discussed at face value and as it pertains to the encoding specificity principle, and more specifically, to language-specificity; more memories are recalled when the language of recall matches the language at encoding (see Marian & Neisser, 2000). It was my hypothesis that this effect would be evident in the overall recorded conversations, but that this effect may or may not be narrated orally. In other words, I believe the language of the internal encoded memory may be different than the language of the retold memory. Concerning code-switching, many studies have shown that it occurs when there is a mismatch of languages between memory and discourse (as already mentioned), so I hypothesized that this same occurrence would take place in this study. I anticipated that there would be more instances of code-switching when there was a mismatch between the language of the questions and the language of the encoded memories and more code-switching during the period of immigration, when both languages were used.

The combination of data gathering techniques (interview and questionnaire) provided thorough and true representations of language use and naturally occurring code-switches. The specifics of this research will unfold in detail in section four. Suffice it to say now that by recording naturally occurring code-switching, as found in discussions among two or more bilingual speakers, one obtains perhaps the most realistic examples of conversational code-switching. Recorded data such as this can be added to a code-

switching database, such as LIDES (Language Interaction Data Exchange System), so that other researchers who are interested in this phenomenon may have access.

The results from this project will make a valuable contribution to the existing body of research and theory in bilingualism, code-switching, and bilingual autobiographical memory. In addition, the transcribed and translated conversations will be compiled into a book and given to all participants in this study as a token of appreciation for their time and their information shared. This commemorative compilation will not only preserve their oral histories as Italian immigrants to Canada, but will serve as a historical archive of their language and culture prior to its possible extinction in Canada (due to natural heritage language loss factors). Since second and third generation Furlans are not fluent speakers of the language, the need for its preservation is paramount.

This paper is divided into five sections. Following this section (Section 1), Section 2 begins with a look at bilingualism and language contact, followed by a chronological summary of code-switching theory and research. Various studies pertaining to bilingual autobiographical memory are presented in Section 3. My current study is explained in Section 4, including a detailed explanation of the methodology along with a thorough discussion about the data collected. Section 5 brings current research and study results together in hopes of answering questions posited throughout the sections relating to language-dependent memory in bilinguals. It is hoped that the information provided in this study will make a valuable addition to the ever-growing body of research in sociolinguistics and that the results found here will inspire future research in bilingual code-switchingin autobiographical memories, especially in elderly immigrants who speak languages that are in danger of extinction.

2   Code-switching over the years

2.1   Introduction

"(I)t is helpful to imagine that when bilinguals code-switch,
they are in fact using a twelve-string guitar,
rather than limiting themselves to two
six-string instruments"
(Valdés, 1988, p. 126).

This metaphorical analogy illustrates very well the extended ability that bilingual speakers have at their disposal. Having two languages in one's repertoire is like playing a twelve string guitar rather than a six string; the options increase with the added strings, or languages in the case of bilinguals. In casual conversation, bilinguals may routinely incorporate or switch words between their shared languages. Sometimes, this code-switching goes unnoticed, other times the switch is intentional, to include or exclude others, for example. It is this conscious/subconscious choice that frustrates and fascinates linguists who continue to posit code-switching theories. Understanding the mechanics of how language works in a monolingual brain is challenging, but not nearly as challenging as trying to figure out how this all works in a bilingual brain. Perhaps most difficult is determining 'why' bilinguals switch languages in conversation or what 'triggers' make the switch occur. These thoughts may spur many questions about code-switching, which include:

- What exactly causes a bilingual to code-switch?
  - Is it the language used by the interlocutors?
  - Is it the topic of conversation?
  - Is it the level of proficiency of the bilingual?
  - Is it the similarity or dissimilarity of the bilingual's languages?
- What causes the switch back?
  - Is it different that the initial switch?
  - Is code-switching a conscious (voluntary) or subconscious (involuntary) action?
- Is there a trigger mechanism in our brain for code-switching?
  - Is the trigger exclusive to code-switching or is it shared by other brain networks?
- Are there constraints in code-switching and language selection?
  - Are they universal or language specific?

The questions are too numerous to be answered in any one study, which gives rise to the importance of a multidisciplinary approaches and continued studies in code-switching research.

The next section begins with some background information about language contact and bilingualism; the precursors to code-switching. What follows is an explanation of code-switching and the difficulty surrounding the terminology, which can lead to ambiguity and misconception in research. Next is a historical chronology of code-switching spanning the past sixty years, including the various theories that linguists have proposed. The section ends with a brief look at neuroscience research on normal (healthy) and pathological code-switching in the brain.

2.2   Language contact and bilingualism: A brief overview

Language contact has taken place since people first spoke. It is unknown when it began, but a typical scenario may have played out like this. One tribe (we will call T-1, who speaks one language, L-1) encounters another tribe (we will call T-2, who speaks another language, L-2). Since they speak different languages, strategies would be sought by T-1 and T-2 in order to communicate their intended messages. This could be via non-verbal gestures and/or words from either L1 or L2. If both tribes remain together, there is a great chance that over time some tribe members would learn words from the other in order to communicate more effectively, resulting in some kind of bilingualism, as per Appel & Muysken (1987) who argued that "language contact inevitably leads to bilingualism" (p. 1). Although this scenario is rather simplistic, it does illustrate the basic process of language contact and bilingualism, which occurred to the participants in this study and continues to occur in places all over the world.

When studying contact language situations, it is important to investigate it from various angles. Weinreich (1964) talked about the limitations in the approach used to study languages in contact and emphasized the need to combine efforts from other interested disciplines by saying "...the linguist who makes theories about language

influence but neglects to account for the socio-cultural setting of the language contact leaves his study suspended, as it were, in mid-air..." (p. 4). In his book *Dynamics of Language Contact*, Clyne (2003) wrote "...language contact is a multidimensional, multidisciplinary field in which interrelationships hold the key to the understanding of how and why people use languages the way they do" (p. 1). When we look at contact perspectives, we can gain a broader understanding of bilingualism, code-switching and the individual language learner.

One thing to consider when studying contact language situations is the individual person, as Weinreich (1964) said: "...the bilingual speaker is the ultimate locus of language contact" (p.71).This is an important consideration to our understanding of, and contribution to, bilingualism and code-switching theory. Individuals have unique learning styles, strategies and motivations when learning a second or subsequent language, but it starts with the individual who encounters another language via movement. A wise woman once said in Furlan:

"*li montagnis ha stan fermis ma la zent ha cjaminin*"
[the mountains stay still but the people walk]
(personal communication)

Many factors shape a bilingual's level or degree of linguistic proficiency. It is difficult to determine which ones contribute, or to what degree they contribute to the overall competence of one's linguistic abilities since these factors can vary greatly. This is a complicated process, which takes time to complete. Brown (2000) summarized this involvedness by saying that:

> Learning a second language is a long and complex undertaking. Your whole person is affected as you struggle to reach beyond the confines of your first language and into a new language, a new culture, a new way of thinking, feeling, and acting. Total commitment, total involvement, a total physical, intellectual, and emotional response are necessary to successfully send and receive messages in a second language (p. 1).

Brown (2000) continued to explain that bilingual proficiency is a result of many contributing factors. Sociocultural factors, which include attitudes, stereotypes, culture,

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social distance, language policy and other generalizations about the second language and its culture contribute in various ways to one's success in second language acquisition (SLA). Motivation, self-esteem, anxiety, inhibition, along with age of acquisition, learning styles and strategies contribute as well.

In this study, the primary motivating factors for my Italian participants learning English in Canada during the fifties and sixties would probably be intrinsic, either integrative "L2 learner wishes to integrate with the L2 culture (e.g., for immigration or marriage)", or instrumental "L2 learner wishes to achieve goals utilizing L2; a career, for example" (Brown, 2000, p. 166). When asked how they learned English after moving to Canada, the majority of them said they just picked it up at work (speaking to non-Furlan/Italian speakers), at school (some immigrants were young children when they immigrated to Canada), while others said they learned from their kids once they started school (personal communication). Most of them did not take English classes, or if they did, it was only for a short time. The radio and the newspaper were great resources for these Italian immigrants during their first few years in Canada. Two friends (in standard Italian) discussed their L2 learning and some difficulties they had with the English language

M: **si…beh allora, ho detto prendo un giornale, ascolto la radio… ascoltavo sempre la radio locale.. qua da Hamilton CHML or qualcosa….sento come pronunciano li e guardo com'é scritta…no… ho detto, ma com'è che, guarda, si scrive in una maniera e si pronuncia in un altra, si legge un altra ancora…**
A: **è vero**
M: **è-e quello è stato difficile**

M: yes, so then, I said, I get a newspaper, I listen to the radio...I always listened to the local radio here in **Hamilton, CHML or** something...I hear how they pronounce it and I see how it is written, right, I said, but how come, you see, you write one way and you pronounce in another, and you read in yet another...
A: it's true
M: that's what was difficult (½-C-M & ½-C-A)

In all cases, the participants spoke positively about learning English although they could not remember exactly 'how' they learned the language (their motivational factors) or when they considered themselves 'bilingual'. In general, what rang true for many was the fact that "it was a matter of survival in those years" (personal communication).

Determining when or at what point one becomes bilingual, is a question that largely remains unanswered. How proficient or fluent does one need to be in the L2 in order to be considered a 'true bilingual', or does that even exist? The degree of bilingualism, which Chin & Wigglesworth (2007), explained as the "levels of linguistic proficiency a bilingual must achieve in both languages..." (p. 5) is ambiguous. Professionals and laypeople differ on their opinion of what this entails. In the above passage, speaker M1 raised a good point about the differences between reading, writing and speaking English. Do bilinguals need to be proficient in all linguistic aspects of language to be called proficient (in reading, writing, and speaking)? Before answering this question perhaps one needs to determine the definition of bilingualism.

Many definitions for bilingualism have been posited over the years. Bloomfield (1933) talked about various levels of language learning in immigrants and described the extreme case of bilingualism as having "native-like control of two languages" (p. 56). Valdés (1988), in his study of Mexican Americans in the United States, said that "the term 'bilingual'...describes an individual who has 'more than one competence,' ...who can function to some degree in more than one language" (p. 114). From his research in language contact, Clyne (2003) defined bilinguals to be "people employing two languages, who recognize themselves and are recognized by others as using two languages" (p. 4). An important distinction was made by Grosjean (1989) who argued that "the bilingual is NOT the sum of two complete or incomplete monolinguals; rather, he or she has a unique and specific linguistic configuration" (p. 3). This last statement is very crucial in our understanding of the term. Also important when thinking about the term bilingualism is how one analyzes bilingual data. Gardner-Chloros (2008) said "the term 'bilingual data' presupposes that there is a clear distinction between monolingual and bi/plurilingual speech. In fact, this is not as straightforward as it seems" (p. 53). What

becomes obvious from these and many studies on bilingualism is the fact that defining the term 'bilingualism' is far from clear. In layman's terms and for the sake of this paper, we will adopt the definition given by Clyne as this best captures the views held by several participants in this study.

The term 'bilingualism' is broad and subsumes various subcategories. Appel & Muysken (1987) differentiated between societal (two or more languages are spoken in a given society) and individual bilingualism (two or more languages spoken by the individual). The later is most relevant in this study regarding the participants. Other differentiations are made by Chin & Wigglesworth (2007) who distinguished the differences between a balanced bilingual (one who is fully competent in two languages), dominant bilinguals (one with dominance in one of the two languages), a passive or recessive bilingual (competence in one language diminishes due to non-use), and a semilingual (one with limited use or proficiency in both languages). In this study, there were a variety of types under this category. Since there are many subcategories in bilingualism one needs to be cognisant of these differences in sociolinguistic analysis.

Other subcategories of bilingualism include age and method of acquisitions, in other words, when and how the second language was learned. Grosjean (1982) explained simultaneous acquisition as learning two languages at the same time before the age of three and successive acquisition as learning a second language after the first. The participants in this study would be considered successive (some call it consecutive) bilinguals, those who have learned English after Furlan (and Italian at school).[3]

Various bilingualism models and theoretical viewpoints have been put forth over the years. The language mode continuum designed by Grosjean (1989, 2001) provides a good visual representation of one's language mode that stretches between monolingualism at one end and bilingualism at the other. On each side of this continuum are the languages spoken by the bilingual showing the range of activation represented by colour (dark=active, white=inactive). The activation of the languages can vary across the

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[3] Some participants in this study came to Canada before grade two and did most or all of their schooling in English.

continuum and can depend on several things, for example, the individual interlocutors themselves and the language environment where the communication takes place. Grosjean (2001) said that bilinguals "often report that they change their way of speaking when they are with monolinguals and when they are with bilinguals" (p. 1), which can be summarized nicely with this type of model.

The Language Mode Continuum by Grosjean
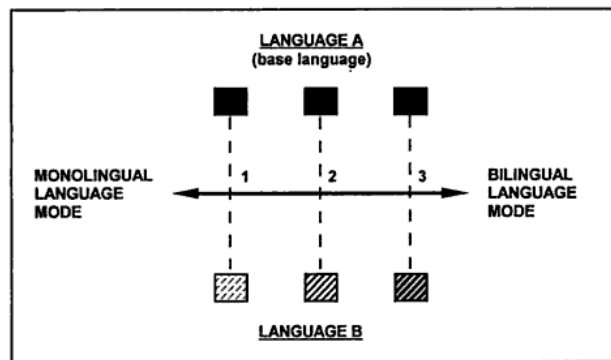
Figure 2.1 (Grosjean, 2001, p. 3)

The two-dimensional linearity of Grosjean's model may work well to represent bilingual speech, but it falls short of explaining how it would reflect multilingual speakers. An adaptation I propose to Grosjean's model (see Figure 2.1) demonstrates not only bilingual learners, but multiple language learners too, which is represented via the inverted triangles above and below the continuum. Each additional language interacts to some degree, both with the base language and the subsequent languages acquired, affects the level of competence and use, which can easily be shown along the language mode continuum. The triangles are symbolic only. Their size, shape etc. do not indicate linguistic competence, rather, they demonstrate a range of abilities, both vertically and horizontally, that can be observed in conversational discourse. The circles used represent the languages known to the speaker. In the case of concurrent bilinguals (two or more languages spoken from birth), an additional circle or circles could be inserted at the top as 'base' language, which would then interact with any subsequent languages acquired by the speaker. In addition, any code-switching that may occur could lie anywhere along the language mode continuum or within the triangles themselves. For example, the base of

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the triangle may represent a multilingual who code-switches frequently and the tip of the triangle may show one who infrequently does. Code-switching is not stagnant. The frequency and nature would change and since code-switching is complex and affected by many factors, a model such as this one needs to be simplistic and versatile enough to allow such personal variation. This model gives a broad visual representation of the languages known to the bilingual or multilingual with the underlying understanding that code-switching can occur at any level and at any point within the triangles or along the continuum. Bilingualism and code-switching are ever-changing and are difficult to determine. The limitless possibilities that can be plotted on this type of model is universally appealing as it can be used to represent any languages and level of code-switching found in discourse.

Multilingual Model Proposed by Mior, 2012
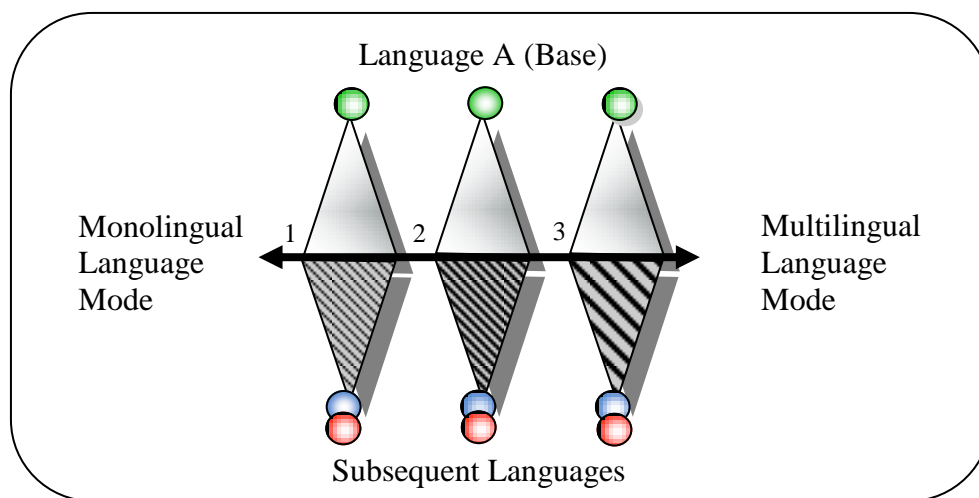
Figure 2.2

2.3 Code-switching: What is it and how is it 'labelled'?

2.3.1 The history of the term code-switching

Switching languages in conversation between bilinguals is not a new phenomenon. Although code-switching was recently coined, researchers discovered evidence of code-switching from texts found thousands of years ago. Penelope-Gardner (2009) revealed

instances of code-switching between Latin and Greek from ancient texts between Cicero and Atticus (taken from Adams el al., 2002). She referred to Trotter, (2002) who included code-switching examples that were taken from English and French Medieval texts. Gumperz (1977) discussed a survey done by Timm in 1975 that showed instances of code-switching, which took place during the early Middle Ages. It was not until the 1900's that a term was formally coined for this phenomenon.

Most agree that it was Vogt who first coined the term code-switching. Vogt (1954) was greatly inspired by the work of Weinreich (1953) although Vogt was more realistic about the reasons for switching. He said, "Code-switching in itself is perhaps not a linguistic phenomenon, but rather a psychological one, and its causes are obviously extralinguistic. But bilingualism is of great interest to the linguist because it is the condition of what has been called interference between languages" (p. 368). Earlier, George Barker (in Nilep, 2006), investigated code switching and language choice among Mexican Americans in Tuscon, Arizona around 1947. Barker observed and made note of the different situations where code-switching occurred between languages; family verses formal interactions, for example (in this study he looked at English and Spanish). Although it was Vogt who coined the term code-switching (in writing), it was Weinreich (1964) who brought awareness to the phenomenon, which he called interference. From this time foreword, the phenomenon Vogt called code-switching has been called many things from code mixing to alternation, which will be discussed in detail next.

2.3.2 The labels given to this phenomenon

Over the years, linguists have referred to this phenomenon by various definitions. Nilep (2006) provides a sociocultural definition for code-switching: "a practice of parties in discourse to signal changes in context by using alternate grammatical systems or subsystems, or *codes*" (p. 17). He continued with "codes cannot be directly observed..." but "...emerge from interaction, and become relevant when parties to discourse treat them as such" (p. 17). What Nilep said about 'code' is most interesting. How do you know

what 'code' is in code-switching? How do interlocutors determine this in conversation and what is the relevance to the speaker's knowledge of such? Code-switching often goes unnoticed between bilingual speakers. Many participants in my study said they do not realize that they even switch languages when conversing with other bilingual friends and family members. So if bilingual speakers do not consciously differentiate between 'code' in code-switching and the conversation is mutually understood as one language (even though both languages are being spoken), does it really matter what code is, and if so, can we isolate its definition? Many linguists avoid defining this and refer to 'code' as simply a language or dialect. Others use the term when discussing monolingual speech to include language styles, registers, etc. For this study, 'code' refers to whatever language is used in conversation before and after the point where the switch occurs.

Another distinction that needs to be considered is the differentiation between code-switching and borrowing in data analysis. The big question is what constitutes 'borrowing'? How do you determine what words are borrowed or loaned when language is ever changing and diachronic? Boztepe (2003) highlighted this problem and said "we cannot really determine at what point in time a particular lexical item gained the status of a loanword in the recipient language" (p. 5). The distinction between borrowing and code-switching will not be made in this study. Any borrowed word (i.e. *polenta*) in the discourse will be regarded as a code-switched item.

Perhaps most frustrating with regards to code-switching research is the fact that there is inconsistency in the choice of term used by linguists. Some linguists (Clyne, 2003) use the term '*transference*', which incorporates several types of code-switching such as lexical, multiple, morphological and so on. Jacobson (2001a, 2001b) and Toribio (2001) use the term language '*alternation'*; however, the direction of their studies incorporates different methodological considerations. Muysken (2000, 2009) uses the term '*code-mixing*' to explain intra-sentential switching (switching within the sentence) and defined mixed codes (2009) as "a way of speaking which shows evidence of substantial amounts of morpho-syntactic and/or lexical material from at least two different languages" (p. 315).

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What we can say at this point, with any amount of certainty, is that code-switching is a complex phenomenon, which consists of many layers and levels of potential analysis and confounds. It is for this reason that we need to broaden our scope of analysis and incorporate multidisciplinary approaches in this type of research, as was done in this study. This cannot be done without first looking at code-switching studies conducted over the past several decades. What follows is a broad overview of code-switching over time.

2.4 Code-switching theory: Evolution over time

The theory of code-switching has evolved considerably over the years. It became its own discipline during the mid fifties as it went from random interference to constraint-based switching, from partial constraints to universal tendencies, from language mixing to minimalism. Over time, conflicting data and methodological discrepancies began to surface, which gave reason to emphasise the incorporation of multidisciplinary approaches to code-switching. To date, no single theory or hypothesis has unanimously been agreed upon, and in many ways, it seems as though code-switching theory has come full circle to where it began in the mid nineteen hundreds.

2.4.1 The years 1950-1979

Code-Switching became its own discipline between the years 1950-1979. Prior to this, the phenomenon was discussed in bilingualism research, but not in positive ways. It was viewed as an inability to keep languages straight. Back then, people who switched languages while talking were considered less intelligent or less educated than those who did not. This attitude created a strong stigma, which some admit to feeling still today. Several participants in this study would apologize in advance for switching languages even though they knew that this was perfectly acceptable given the topic of the research study. Code-switching research has moved from random switching to grammatical

constraints (For a detailed review see Nilep, 2006; Gardner-Chloros, 2009; or MacSwan, 2009).

The research concerning code-switching began to develop with Haugen, (1953), who differentiated between 'borrowing' and 'mixing'. He said that borrowing should not be labelled with the metaphor 'mixing' as some consider the term 'mixed' or 'hybrid' (languages) to be a pejorative term. The dispute between borrowing and mixing still prevails today in code-switching research, but its distinction bears no impact on the objectives of this study as all language switches or borrowings are considered code-switching.

Perhaps the most instrumental literature contribution in the advancement of code-switching was by Weinreich (1964). Although he did not officially use the term code-switching, he referred to language switching as *interference* which "...implies the rearrangement of patterns that result from the introduction of foreign elements into the more highly structured domains of language, such as the bulk of the phonemic system, a large part of the morphology and syntax, and some areas of the vocabulary..." (p. 1). He defined two broad characteristics of the bilingual speaker, one of which is the switching facility and wrote "the ideal bilingual switches from one language to the other according to appropriate changes in the speech situation (interlocutors, topics, etc.), but not in an unchanged speech situation, and certainly not within a single sentence" (p. 73). He said if expressions from the other language are used, then they would be marked by quotations (written mode) or with a pause or special voice (spoken mode) to distinguish the difference. He further said that switching differences exist in individuals between those who can control the switches (keep to the pattern of the language) and those who have difficulty with the switches. The 'proneness to switches' he added could be a learned behaviour; parents indiscriminately talking two languages to their children, for example. He discussed many aspects of language contact (proficiency, use, age of acquisition) and noted that interference can change over time; however, it is not because the languages themselves change, rather it is the bilingual individual who changes. He concluded by discussing the need for a broad or multidisciplinary approach to studying linguistic

interference, which I believe is logical and necessary in contemporary code-switching analysis.

Fishman (1965) looked at the sociolinguistic aspect of language use and said that to study bilingualism and learn of the diversity of bilingual settings, a cross-cultural perspective is in order. He said that you cannot treat all bilinguals equally and "...interference and switching varies for the same individual from occasion to occasion and from situation to situation. Although interference and switching are lawful behaviours, there are types of bilingualism in which even linguists will be hard pressed to determine the answer to 'which language is being used?'"(p.p. 228-9). Fishman highlighted diversity among bilinguals and bilingual settings, which he said had an effect on interference and switching. Fishman's viewpoint on diversity is an important consideration for code-switching research.

In the 1970's, code-switching studies reflected a grammatical and rule based approach. Gumperz (1977) looked at conversational code-switching and referred to this as "the juxtaposition of passages of speech belonging to two different grammatical systems or subsystems, within the same exchange" (p. 1). He recorded natural, everyday talk between bilinguals in three diverse social and linguistic situations (Spanish-English, Hindi-English, and Slovenian-German). He analysed and found different usage between the 'we code' (associated with in-group relations and informal activities) and 'they code' (associated with formal, out-group relations) in all groups of bilinguals. Gumperz looked at the semantic attributes of code-switching and found that bilinguals use both grammatical and social knowledge in interpretation of their multilingual discourse, and concluded that bilinguals define their own social code or style in conversation. He says code-switching is not idiosyncratic behaviour, as stated by Labov in 1971, rather it is stylistic and metaphorical and reflects a kind of linguistic patterning.

In 1979, Pfaff looked at functional, structural, semantic, and discourse constraints for intrasentential code-switching (language mixing) in a corpus of 200 Spanish or English speakers in a variety of settings. Pfaff grouped the switches as single lexical items, phrases, and clauses at the onset of the switch. Based on her results, she did not posit a

third grammar since speakers who code-switch showed competence in the syntax of both languages that interacted accordingly based on the constraints outlined (functional, structural, semantic, discourse etc.).

It becomes clear in the literature that code-switching had gained great interest and had become a phenomenon on its own by the end of the 1970's. Also during this time, we began to see diversity and complexity in code-switching research, which linguists tried to explain by way of rules and regulations.

2.4.2 The years 1980-1999

This period saw a shift in code-switching theory from no constraints, to syntactic constraints, universal constraints and typological categorization (For reviews see Jacobson, 1998b; Auer, 1998; MacSwan, 1999). During this period, linguists explained code-switching with rules and constraints in order to describe what could or could not occur. Prior to 1980, commonly referred to as the pre-Poplackian era, research on code-switching was more pragmatic in scope and more focused on language contact and use rather than on limitations of language switching. As the literature on code-switching grew and more language samples were reviewed, linguists such as Poplack, began to consider specific factors involved in code-switching such as syntax and grammar.

Poplack was instrumental in the advancement of code-switching theory. She proposed two constraints in 1980; the *equivalence constraint (*on each side of the code-switch the syntax must be grammatical) and the *free morpheme constraint (*no switch is allowed between the lexical form and the bound morpheme). She argued that the equivalence constraint can measure bilingual ability (fluent or non-fluent) based on ones type of code switching. She hypothesized that non-fluent bilinguals would violate equivalence or avoid switching within a sentence, which would be syntactically too risky. Her results showed that both fluent and non-fluent bilinguals code-switched frequently, but differently. Fluent bilinguals switched at syntactic boundaries within the sentence, while non-fluent bilinguals switched between sentences so as not to violate the grammars of L1 or L2.

Poplack concluded by saying "Code-switching, then, rather than representing deviant behaviour, is actually a suggestive indicator of degree of bilingual competence" (1980, p. 616).

A few years later, Poplack (1987) expanded her research to include two bilingual communities, Puerto Ricans in New York and French Canadians in Ottawa/Hull. She chose two similar bilingual communities to determine strategies for incorporating English into bilingual discourse. Results of the code-switching varied, perhaps due to methodological differences. For this reason, she said it is important to know the patterns of the community (bilingual and monolingual), the individual's ability, and the context of code-switching. She also said that this could only be done via "systematic corpus-based research carried out within her or his community" (p. 52).

In the book, *Language Contact and Bilingualism*, Appel & Muysken (1987) investigated the problems with past code-switching research, which focused on answering questions about why and not where or at what point switching occurs. The shift, they said, was to look at intra-sentential code-switching or what they called 'code mixing' along with the strategies and constraints pertaining to it. They outlined three methodological problems in the current research; distinguishing between mixing from word borrowing, accepting what the base and host languages are in the analysis, and deciding on the type of constraint (absolute constraints or statistical trends). They also discussed prior constraints in code-switching literatures. Particular grammatical constraints became popular starting in the seventies, followed by universal constraints in the late seventies, early eighties, and relativized constraints (a type of neutrality) also in the early eighties. Along the lines of Poplack, (1987), they said: "it is by no means certain that code switching has the same functions within each community" (p. 120). The data collected in the seventies and early eighties allowed researchers to uncover discrepancies in code-switching constraints, which in turn invited linguists to posit other types of code-switching patterns or reasons for switching.

In the nineties, linguists changed their focus from specific grammatical constraints and individual discourse functions to other factors responsible for code-switching. Gardner-

Chloros (1991) looked beyond a universal explanation for code-switching to autonomous levels of explanation where each level corresponds to its own set of research questions. She performed a detailed analysis of code-switching in six conversations of Alsatian-French bilinguals in Strasbourg and found that "people's motivations for code-switching are often complex, made up of several different layers which one has to try to disentangle" (p. 190). Regarding variable types, such as phonology, syntax and so on, she said, "a continuum seems more appropriate than trying to draw clear-cut distinctions" (p. 191). She draws three main conclusions: 1) Code-switching is one element of a complex structure of bilingualism. 2) The type of code-switching analysis is important for the conclusions one makes (the study looked at code-switching within single utterances). Different types of code-switching analyses are important to the breadth of code-switching research (for example, synchronic vs. diachronic and individual vs. community).

A study, which advanced code-switching theory, was by Myers-Scotton, who in 1993 introduced the *Matrix Language-Frame Model* (MLF) to describe intrasentential code-switching (two or more languages used in the same sentence). Her detailed account of the model is based on the Matrix (ML) or dominant language, (includes more words and morphemes than the second language) which sets the grammatical framework for code-switching and the Embedded (EL) or less dominant language that is inserted into the Matrix or grammatical framework. The distinction between content morphemes (i.e. nouns, adjectives, verbs, and prepositions) and system morphemes (i.e. function words) is important when assigning ML or EL to the data.

Bentahila & Davies (1995) reviewed code-switching research over the past twenty years and discovered two dominant themes; one included grammatical constraints, discussed by Poplack in 1980 and Di Sciullo et al., in 1986, the other included discourse functions proposed by Gumperz in 1982. What Bentahila & Davies did not find were answers to 'how' code-switching is affected by the languages in contact and what were the code-switching patterns that resulted from language contact situations. The authors did not propose any one particular approach; they showed ways in which types of code-switching and language contact were related, drawing on their data of Arabic-French

bilinguals. Their groups (older vs. younger generation speakers) showed similarities in the types of switching, but considerable differences were found in frequency. These results supported their view that code-switching reflects many things; an individual's lifestyle, the languages, roles, and circumstances encountered.

Code-switching continued to draw interest among linguists throughout the decade. By the late nineties, there was a noticeable increase in the number of code-switching experiments and proposed hypotheses and theories. During this time linguists began to find examples that disproved the narrow constraint based theories already proposed, and broadened their scope towards universal explanations. Certain arguments carried on throughout the nineties. One item debated among scholars was, and still is, defining the word 'code' in code-switching.

Alvarez-Cáccamo (1998) reviewed the origins of code-switching in order to address the crossroads in research between the association of speech varieties of 'code' and the impossibility of assigning meaning to code-switching. He considered the differences of marked and unmarked codes in code-switching research and asked if this indicates that two distinct phenomena are going on "or is something missing in the way code-switching is currently being conceptualized" (p. 29)? He proposed that code-switching be narrow enough to "exclude socially or interactionally meaningless variety-alternation" and broad enough to "include phenomena of monolingual speech (such as prosody or the deployment of speech markers) which recontextualise talk by signalling the onset of emerging frames by virtue of the codes associated with them" (p. 42). He pointedly addressed the essence behind code-switching discrepancies; defining what 'code' is in code-switching.

Following the discussion of Alvarez-Cáccamo, Auer (1998) argued that code-switching is not just using two or more codes, but rather a conversational event and that it is not easy to define the term. The problem, he said, was to make sure that the labels were the same between the linguist and the participant. He also said that "...the definition of the codes used in code-switching may be an interactional achievement which is not prior to the conversation...but subject to negotiation between participants" (p. 15). Code-switch

points that he said were most frequent in the data include reported speech, topic shift, topic structure, parentheses, reiterations, interlocutor, setting of the conversation, change of activity, and puns. He argued for the term 'mixed code', which he said would incorporate other types of switching in the conversational event.

An original idea for code-switching analysis was put forth by Azuma in 1998. He reviewed many code-switching examples from various linguists (i.e. Muysken, Levelt, Jacobson, Myers-Scotton) and proposed a new method of understanding intrasentential code-switching. This principle stated that "any segment which can meaningfully stand alone in the speaker's mind, may be code-switched" (p. 114). Prior research had shown that open-class items or content words such as adverbs, nouns, to name a few, can be switched because they are meaningful and have semantic and pragmatic content. Azuma took this a step further and correlated word class items with the stand-alone principle and discovered that some closed-class words (function words) can also be code-switched due to the strength of their semantic role in the sentence. Various language pairs were used to prove his stand-alone principle, which gave his method a universal appeal.

A pragmatic and functional approach to code-switching was found in the work of Franceschini (1998) who analysed tape-recorded conversations from participants in Switzerland and northern Italy. She saw code-switching not as a peripheral, supplementary or additional behaviour, but as a "general characteristic of language" and as an "extra-linguistic factor" (p. 52). These behaviours, which she placed in the middle of a single continuum with monolingual practices on either side, rule the language system. She suggested that a dual focus model could represent code-switching. In conclusion, she said, there is a need for a "theory of language use in interaction" and that we should "widen our horizons: *variation, languages in contact, flexibility* and the *urge of individuals to differ from each other...*" (p. 66).

This pragmatic approach was also evident in the work of Jacobson in 1998b. He examined three decades of code-switching research focussing primarily on the work of Poplack and Myers-Scotton along with the different theoretical views brought forth by their research. Based on counterexamples of other language family pairs and from

Jacobson's own data of discourse analysis, it was evident that a universal theory of code-switching could not unanimously be established. Although the theories of Poplack and Myers-Scotton were instrumental in providing new perspectives to our understanding of code-switching, he felt that caution was in order. He said that "More mixed systems must obviously be studied before truly universal traits can actually be captured...it may be wise to be more cautious and more modest in not postulating universal characteristics for language mixing but rather focus on the speaker..." (pp. 63-64).

   The idea of matrix language by Myers-Scotton was evident in Rindler Schjerve's (1998) study of code-switching and language shift in Sardinian-Italian bilinguals. She said, "...we should regard codeswitching as a systematic process resulting from the interplay of socio-psychological motivations, social norms, and structural-linguistic conditioning..." (p. 221). She believed that code-switching was a communicative resource for bilinguals, but that it was determined by the constraints (sociolinguistic and structural) of the language pairs involved. Based on her data, she concluded that code-switching (both interphrasal and intraphrasal) does not accelerate language shift, rather it serves as a bridge between the two languages.

   In 1998, Treffers-Daller tested several assumptions of Grosjean's bilingual speech processing model (based on the language-modes continuum) using Turkish-German code-switching data. The study results supported Grosjeans's model and proved that a base language can be determined in the three different language situations. In addition, she said that the model could predict the frequency of the code-switches within the speech turns and that it could also predict which language would more likely be the matrix language in intrasentential code-switching.

   Auer (1999) conducted an innovative study in an attempt to describe previous types of code-switching with a unified typological explanation, which he called "a continuum of language alternation phenomenon" (p. 309). Auer extended the criteria of code-switching (meaningful switching at a local level) to include the natural, one-way tendency for code-switching to move from language mixing (meaningful switching at a global level) to fused *lects* (obligatory use of one or the other language visible at the deep grammatical

level). This polar span, he said, demonstrates the combination of the varieties or languages in individual bilingual speech communities.

An extensive and original study by MacSwan in 1999 revealed shortcomings in previous approaches by Poplack, Joshi, Mahootian (and others) and argued that their proposed theories and analysis to code-switching were empirically flawed. As an alternative, MacSwan built his theory on Chomsky's minimalist claim and stated, "nothing constrains code switching apart from the requirements of the mixed grammars" (p. *Xxv*). He supported this with his research on the grammatical features of intrasentential code switching from his original corpus of Nahuatl and Spanish bilinguals. His analysis of other studies revealed conflicting evidence (see summary on p. 54). His minimalist claim, however, was proven in many language samples. MacSwan concluded that the only constraint for code switching is what is required of the mixed grammars and that this constraint is the same one used when checking for grammatical features in monolingual speakers.

2.4.3 The years 2000-2011

Although current views regarding code-switching are mixed, many linguists highlight the importance of collaboration and cooperation among researchers from various disciplines (psychology, cognitive science, anthropology and so on). Based on the evolution of code-switching studies and literature reviews over the past sixty years, it appears as though the phenomenon of code-switching has come full circle. Linguists first described it as random, erroneous even, then tried explaining it with rules, restrictions and universal tendencies. Current researchers may agree that code-switching is too complex a phenomenon to incorporate into any one theory, so a multidisciplinary approach would seem logical for any future studies.

The structural and sociolinguistic work by Muysken (2000) described intrasentential code-mixing that includes grammatical features and lexical items from two languages in one sentence. He distinguished three distinct processes; *insertion*—material from one

language into the structure of another, *alternation*—switching between language structures, and *congruent lexicalization*—words from other languages switched into the grammar of one. The focus of his research was mostly grammar based and incorporated results from many studies. His goal was to account for patterns in code-mixing rather than to propose a singular model because he believed that a single model was not only unrealistic; it did not exist.

Ben-Rafael (2001) looked at code-switching as a whole (as a continuum) and did not distinguish between borrowing and code-switching in his analysis of immigrant French-Hebrew-Franbreu speakers, but he distinguished between segmental and unitarian code-switching. He concluded that code-switching was not due to attrition, but was a resource that bilinguals have and use in discourse. In his study he said that code-switches "are inserted without any difficulty in the Franbreu discourse that remains fluid and uninterrupted" (p. 277).

In 2001, Myers-Scotton discussed the developments made to her matrix language frame model introduced in 1993. This was done to address certain problems encountered in code-switching data (system morphemes) that contradicted certain features of the original model. She introduced two sub-models; the *4-M model of morpheme type* and *abstract level model of complex grammatical structure* in order to make clear the system morpheme principle. These models were elaborated by by Myers-Scotton & Jake in 2001, who explained their role in accounting for the three asymmetries in classic code-switching along with other phenomena (*i.e.* contact language). They argued that the 4-M model presented (in Myers-Scotton, 2001) contributed to linguistic theory in general and the other branches of linguistic research can benefit from the use of this model (i.e. second language acquisition or aphasia).

Somewhat contrary to Myers-Scotton is the view held by Jacobson (2001b) who said that there were cases in language utterances where both languages play an equal role in the message (when languages are mixed). Instead of a dominant and subordinate language relationship, as per Myers-Scotton, Jacobson (agreeing with the work of Bentahila & Davis) argued for a third kind of mechanism for code-switching, one that accounts for

this equal relationship, which he called *language alternation*. In his study of Malay-English speakers, Jacobson found it impossible at times to decipher which language dominated the other (similarly found in my study). From these findings, Jacobson developed a list of criteria to assess language alternation. He decided to analyze code-switching at the sentence level whereas Myers-Scotton argued for a clause level analysis.

Torras & Gafaranga (2002) explored the relationship between social identity (the practical acts) and language alternation (the different medium-related activities) in previous trilingual data on Catalan, Castilian and English, compiled by Gafaranga, in 2001. They said both theories are required in order to understand the relationship between them. They concurred with the work of Auer (1984), and argued for a third concept, language preference (the speakers' own language choice), and felt that language preference can categorize ones social identity.

Clyne (2003) contributed greatly to the area of contact language research based on data from a variety of immigrant groups in Australia. Topics include language shift, code-switching, convergence, transference, and so on. He discussed code-switching and the problem with terminology around the term, which he said is best described as transference. Clyne included several types of transference: lexical, morphemic, morphological, semantic and so on. He also discussed transversion, "crossing over from one language to another" (p. 80), and triggering "words at the intersection of two language systems" (p. 80). The categories of trigger-words he summarized include lexical transfers, bilingual homophones, and proper nouns.

Myers-Scotton (2003) again used code-switching data and the Matrix Language Frame model to explain a broader range of bilingual language examples. The code-switching examples previously discussed by Myers-Scotton explained the inflexibility of language or 'classic code-switching', where the morphosyntactic frame comes from one language. This study looked at other examples, which explained the inflexibility of language or 'composite code-switching', where the morphosyntactic frames include contributions from more than one language.

Gardner-Chloros & Edwards (2004) argued that code-switching theories anchored in grammar (syntax) are not universally applicable for several reasons: 1) there is great variability between/within speakers, 2) grammar is abstract and based on ideal sentences, not actual use, and 3) code-switching involves creativity and innovation between the languages involved. They talked about the inconsistencies and counter-examples found in the existing constraint theories by Poplack (free morpheme and equivalence constraints), and Myers-Scotton (MLF model), among others. They suggested that more comparative research studies are needed. Regarding grammatical constraints, they said that "although syntax plays an important role in code-switching, it cannot be assumed a priori that the constructs of syntacticians are the best means for characterising the processes of performance data such as CS" (p. 16).

An area of code-switching research that was lacking at this time was psychologically motivated code-switching, which Riehl (2005) defined as "language alternation that is prompted not by the intentions of the speaker but by the specific conditions of language production" (p. 1945). Inspired by Clyne's work on triggering, Riehl was interested in psycholinguistically conditioned code-switching and listed types of words that could trigger the switch. Based on her data of German-Romance and German-Russian (along with other data) she found that there were differences in the frequency of code-switching due to the language awareness of the bilingual speaker. She agreed with Grosjean who argued that bilinguals have two language networks and said that a connectionist model can explain code-switching triggering better than a modular computational model.

A discourse-related approach to code-switching was the focus of Lowi's (2005) study, which examined code-switching in naturally occurring conversation over the telephone between Spanish-English bilinguals. Common types of code-switching, such as lexical, tags, expressions, phrases etc. were found in her data and were used as discourse markers, to change topic for example. The descriptive and qualitative analysis of the telephone conversations in Lowi's study showed variation in the frequency of switches between the participants, which along with their bibliographies (ethnographic information) reflected how code-switching functions in bilingual discourse.

Schmid (2005) reviewed one hundred years of contact language situations regarding Italian immigration to various parts of the world. He looked at many sociolinguistic code-switching examples from bilingualism, language shift, second language acquisition, and language attrition to see if code-switching results in code-mixing as a code of its own (as per Auer, 1998 & 1999). In his study, he found that contact language consists of socio-linguistic and linguistic factors as well as extra-linguistic factors. As a result, he concluded that in all the data analysed "no mixed language has been created through code-switching by highly proficient bilinguals" (p. 148).

Gafaranga (2008) reviewed current arguments about language alternation, not as a random phenomenon, but as a code-switching conversational strategy via the works of Gumperz (situational and metaphorical code-switching), Myers-Scotton (markedness model of code-switching Auer (Conversation Analysis (CA) approach to code-switching). His review found that language alternation serves many functions: negotiation of speech situations (topic, identities, relationships), negotiation of medium, to repair signals, to provide metaphorical information, only to name a few. He does not regard one model better than the other and suggests that they should be viewed as complementary since "no one approach can claim to be exhaustive" (p. 307), and hopes that "in describing language choice as an aspect of talk organisation, we will not just be using CA, we will be doing CA" (p. 308).

After reviewing various types of mixed codes in code-switching research, Muysken (2008) differentiated roughly 13 patterns (alternational code-mixing, heavy borrowing, congruent lexicalization, insertional code-mixing, and discourse marker switching, to name a few). He included several social conditions under which mixed codes emerged (mixed marriages, new community language, street language, trade language and so on) and based on the pattern found, he came up with a list of linguistic principles that govern mixed codes (see pp. 333-334). He commented on the rather uncharted research on mixed code and asked an important question that had remained largely unanswered: "can we relate the properties of the different mixed codes to the circumstances of their genesis and

use" (p. 334)? In order to answer this question, Muysken said that researchers must extend their studies beyond grammar and the lexicon.

Gardner-Chloros (2009) said that code-switching should be taken at face value rather than from the standpoint of any particular theory, adding that there has been very little agreement regarding the limits and definition of code-switching. She emphasized the fact that code-switching is a prolific area of research that would benefit from the database of code-switching texts called Language Interaction Data Exchange System (LIDES). The key findings she reiterated were: 1) at a linguistic level, code-switching is difficult to define, 2) there are many situations or levels where code-switching is found, 3) many patterns or varieties of code-switching are evident which cannot be explained by constraints or universal theories, 4) an unclear or incorrect definition of bilingualism is used in code-switching analysis. She concluded by saying that to fully understand code-switching we need to look at all areas of inquiry (psycholinguistics, sociolinguistics, syntax and so on) and that "its study should contribute to putting interdisciplinarity on the linguists' map at last, and in the process...to a small and much-needed methodological revolution" (p. 180).

A psycholinguistic approach is seen in the work of Kootstra, van Hell & Dijkstra (2009), who proposed a model of interactive alignment in code-switching based on two experiments that compared results of word-order equivalence (Dutch-English word orders) with and without a dialogue partner. They acknowledged various code-switching approaches and viewpoints concerning theory, terminology, methodology, research goals, and said that code-switching research would benefit greatly if these approaches were merged. Their model, they argued, was comprehensive enough to account for differences in code-switching in individuals and in social interactions. Based on their results, they said that equivalence constraint is present in code-switching and that it can interact with other constraints, like interactive alignment, in dialogue situations.

MacSwan (2009) believed that rules and patterns govern code-switching just as in monolingual speech. He presented a detailed overview of generative approaches to code-switching; Chomsky's 'Aspects' model and Government Binding Theory. From this,

others posited restraint-based theories, which according to MacSwan, were problematic, and too restrictive (Poplack's Equivalence and Free Morpheme Constraints, Di Sciullo's Government Constraint, Belazi's Functional Head Constraint, and Mahootian's Null Theory). Mac Swan stated that under the Minimalist Program, "structures are built from a stock of lexical items, essentially beginning with lexical insertion" (p. 320). This, he said, eliminates the need for code-switching constraints and allows for "linguistic analysis of mixed-language utterances in very much the same way we engage in the analysis of monolingual language" (p. 334).

We may not be any closer to a unified theory of code-switching than we were when the term was first coined by Vogt, but we have made great strides in understanding it from various perspectives. This review is by no means exhaustive. The literature on code-switching is undeniably vast. Researchers from various disciplines have integrated their level of expertise into a potentially unified theory on code-switching, but still no unanimous one exists. What does exist, however, is a greater awareness for collaborative efforts, as was voiced by linguists in the sixties and early seventies. Also, it is only through multidisciplinary approaches that we can begin to understand the many complexities of code-switching. One approach is through neurocognitive science. This next section will look at code-switching in the brain. Both healthy and a pathological brain studies are summarized.

2.5   Neurocognitive studies on code-switching

In the 1980's, code-switching became of great interest to neurolinguists who have advanced the study of this phenomenon to a whole new level. With the onset of Positron Emission Tomography (PET) and Functional Magnetic Resonance Imaging (fMRI) technology, we can explore more accurately, areas or networks of the brain responsible for language and language switching. The following section provides an overview of research pertaining to healthy and pathological code-switching.

2.5.1 Code-switching in healthy brains

The following studies look at code-switching studies in healthy multilinguals. The question that Khateb, Abutalebi, Michel, Pagna, Lee-Jahnke, & Annoni (2007) posited was whether language selection in bilinguals was achieved by a language-specific mechanism or by a general cognitive control process. Their event related potential (ERP) experiment tested bilingual university students (German-Language one (L1) and French-Language two (L2)) in two contexts, a monolingual task selection context and a bilingual language selection context. Their assumption was that if there was any variance in the selection processes across contexts, diverging brain responses would occur rapidly after the onset of the cue word given. The results showed variance in the selection process occurring between ~200-300 millisecond post cue word onset. The variance was mapped onto a brain model showing activation in the fronto-parietal areas (specifically, the left middle frontal-precentral gyri, supramarginal and angular gyri) during the language selection process. In conclusion, they suggested that language selection in bilinguals takes place through a neural network for language processing and general cognitive processing.

   Similarly, Abutalebi, Annoni, Zimine, Pegna, Seghier, Lee-Jahnke, et al. (2008) performed a study using fMRI to investigate whether language switching depends on a language-specific neural module or general executive regions, which could also allow for switching between linguistic registers. Their image naming study tested bilingual university students (German L1 and French L2) in three contexts. Their results indicated differences in brain areas for language control between linguistic registers and L1-L2 selection, which reflected neural network activity in the left caudate nucleus and left anterior cingulated cortex (not ruling out the left prefrontal cortex) in the between languages selection process. Interestingly, they proposed extended activation in these areas of the brain when bilinguals used the weaker language.

   Years earlier, Briellmann, Saling, Connell, Waites, Abbott, & Jackson (2004) found a correlation between language activation and language proficiency in multilinguals. A fMRI study was performed on six multilinguals using a noun/verb generation task in four

of the five languages spoken by each participant (English, German, Italian, French, and Spanish). They were looking at functional activity in the brain and its relation to degree of proficiency in each language. Results showed overlapping brain activity between languages corresponding to levels of proficiency, for example, there was less activation with higher language proficiency. The activation area for all languages involved the common left hemispheric network; specifically the middle frontal gyrus, inferior frontal gyrus, superior temporal gyrus, left angular gyrus, anterior cingulate, and the homologous contralateral areas. The results also proved that activation was not indicative of, or dependent on, age of acquisition and that unintentional code-switching does not occur in normal multilinguals nor does cross language interference.

Code-switching studies in healthy bilinguals provide valuable insights into what area or areas of the brain is involved during language switching tasks. By mapping the areas or neural networks involved in code-switching, scientists can compare these areas to ones highlighted in pathological code-switching in order to investigate correlations or posit new hypotheses. The idea that age of acquisition does not seem to matter in code-switching (see Briellmann et al., 2004) is interesting and one that requires further investigation.

2.5.2 Pathological code-switching

Code-switching can be affected greatly after a stroke or tumour. The following neurolinguistic studies outline various types of pathological code-switching in an effort to demonstrate the differences between patients and the language switching they do and also to highlight similarities found in the brain area or areas responsible for the switch. Since neurolinguistic research on conversational code-switching is a relatively unexplored domain, we should expect to see great advancements in this field in the years to come.

Aglioti, Beltramello, Girardi & Fabbro (1996) did a case study of a bilingual patient (EM) who suffered a stroke resulting in subcortical aphasia with lesions mostly involving the basal ganglia. This uncommon type of aphasia reflected in an unusual recovery of

L1/L2, which remained unchanged five years post stroke. EM spoke Venetan (L1) her whole life and very little Italian (L2). After her stroke, EM communicated mostly in L2, showed asymmetrical code switching, and had great difficulty using her L1 in L1 tests, preferring always to speak in Italian. The authors comment on the unusualness of this case saying that L1 loss contradicts both Ribot's and Pitre's rules. Based on the results of this case study, they suggested separate neural bases for L1 and L2. Also, her L1 loss had a higher degree of automatization compared to L2, which was due to lesions in the basal ganglia mostly. The authors concluded that the results support the role of the basal ganglia in automatized cognitive and motor performance.

   The role of the basal ganglia as evidence for code-switching in the brain was also posited by Abutalebi, Miozzo, & Cappa (2000) based on the case study of AH, a multilingual (Armenian (L1), English (L2), and Italian (L3)) who suffered a left hemisphere stroke resulting in subcortical polyglot aphasia. The lesions were located specifically in the left periventricular white matter in the left caudate nucleus, which resulted in language mixing in oral tasks. AH displayed non-fluent aphasia symptoms equally in L1, L2, and L3, was unable to inhibit language mixing during conversations, but did not violate the grammars or morphological structures of any language in speech production. Based on the location of the lesions, the authors posited the left basal ganglia-left frontal cortex loop in particular, as the neural basis for language switching.

   Fabbro, Skrap, & Aglioti (2000) discussed the results of a bilingual (Friulian (L1), Italian (L2)), who had a tumour in the left frontal lobe resulting in lesions to the left anterior cingulate and frontal lobe area. What was interesting and slightly different than previous studies was the type of code-switching that resulted from the lesions. The authors observed that the patient demonstrated code-switching (complete utterances in L1, then complete utterances in L2) rather than code-mixing (switching L1 and L2 within the same utterance), although code-switching was involuntarily performed. This patient scored well on linguistic tasks in both L1 and L2, made no translation errors, and showed no typical aphasic symptoms; however, this patient was euphoric, disinhibited, and told dirty jokes (which was out of character for the patient). For these reasons, the authors

stated that perhaps the code-switching mechanism is independent of language and that it may be part of a more general system also involved in different communication related behaviours.

Research by Mariën, Abutalebi, Engelborghs, & De Dehyn (2005) investigated a bilingual (English (L1) Dutch (L2)) 10 year old child who demonstrated both code-switching and code-mixing during one phase of his two subcortical strokes (vascular subcortical transcortical sensory aphasia TSA). After the first stroke, which caused damage to the left thalamus, TSA affected L1 and L2 equally. Three weeks post stroke, L1 was regained (no language therapy), but L2 aphasia remained (with intense language therapy). A second stroke left extended subcortical damage to both L1 and L2, which was marked by code-switching and code-mixing during the acute and lesion phases. Code-switching and code-mixing went into remission during the late phase due to a re-perfusion of the left frontal cortex and left caudate neucleus, although aphasia continued in both languages. The authors concluded that the findings from this study provide strong evidence that supports the existence of a neuroanatomical device, located in the anterior subcortical-cortical loop, which is responsible for language control and selection in bilinguals.

A detailed, in-depth analysis of bilingual language representation and control was compiled by Abutalebi & Green (2007). Based on recent neuroimaging data of healthy and aphasic bilingual or multilingual participants, they argued that both cortical and subcortical processes are dynamically involved regarding language selection and inhibition (code-switching) in bilinguals. Specifically, they supported the following claims: 1) there is a common neural network for both L1 and L2 (the single network hypothesis), 2) language control and lexical selection is based on cortical and subcortical structures, 3) output control for L2 shows more competition than for L1, and 4) for language control and lexical selection, the key mechanism is inhibition. The authors included a schematic brain model showing areas of cognitive control. They argued for a single network that represents L1 and L2 in bilinguals and that this network is adjusted, based on L2 proficiency, by the control centers (See Figure 2.3). These included the

prefrontal cortex, the anterior cingulate cortex, the basal ganglia, and the inferior parietal lobule. Based on the different aspects of L2 reported in the studies (converging, diverging, language selection, switching and translation), the authors emphasized how important language control was in bilingual language use (code-switching) and they proposed that this process was based on the specialization of the circuits involved in the language control.

Schematic Brain Model Representing Cognitive Control in Bilinguals
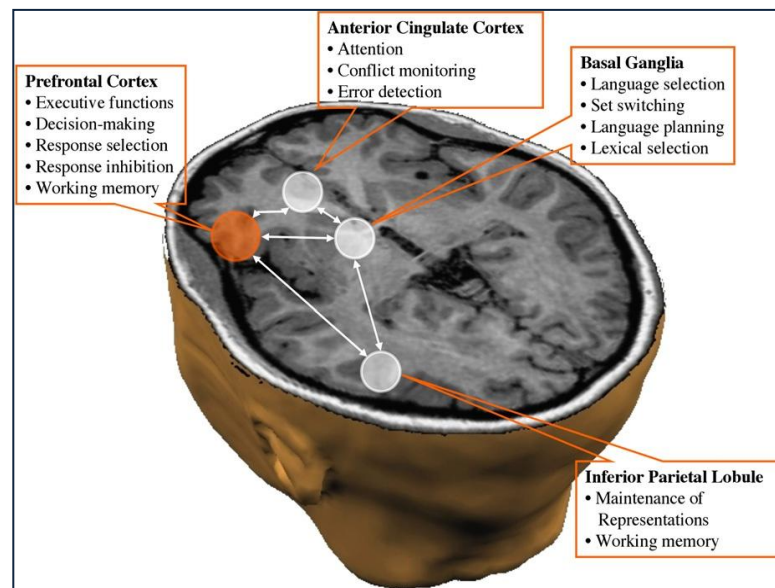
Figure 2.3 Abutalebi & Green (2007, p. 249) Multiple levels of cognitive control and bilingual language production

Another extensive neuroimaging review was conducted by Abutalebi & Green (2008), who looked specifically at cognitive control networks involved in code-switching. They said that the network involved in code-switching was similar to that of task switching, which involves the frontal, the parietal and the subcortical regions. They also said that the caudate nucleus and the basal ganglia (directly involved with inhibition and inappropriate behaviours) which are associated with diseases such as Parkinson's and Huntington's, had recently been posited for their involvement in cognitive control in language planning. They further described that the network of importance in cognitive control (for code-

switching) included the prefrontal cortex, the anterior cingulate cortex, the posterior parietal cortex, and the basal ganglia.

A review of brain mapping studies involving bilinguals, compiled by Giussani, Roux, Lubrano, Gaini, & Bello (2007), compared neurosurgical studies (seven in total) that used direct electrocortical or subcortical stimulation techniques with other brain mapping studies in order to see whether multiple languages have distinct or common cerebral areas. Their review provided the following conclusions: 1) that bilinguals have both common and dedicated areas for their languages. All studies showed that language-specific interference was found in the posterior temporo-parietal areas. 2) Language specific areas in bilinguals were also found in the frontal regions. 3) Subcortical white matter could be found in language-specific pathways. 4) language-specific areas were found regardless of age of acquisition, level of proficiency or language type test. The authors also support the premise that languages used by bilinguals or multilinguals are localized in certain microanatomical systems found in the same larger anatomical areas in the brain. This type of research, which uses direct cortical/subcortical stimulation, provides useful language mapping data, which illustrate the language centres in the bilingual/multilingual mind.

Brain mapping studies may help deepen our understanding of code-switching, and more specifically, of the code-switching mechanism that controls or inhibits language use in bilinguals, but caution is in order. According to Paradis (2004) "the literature on bilingual neuroimaging is fraught with inconsistent results and conflicting interpretations. To blame this confusion on methodological parameters is not sufficient…data can only be compared to similar data" (p. 184). Paradis added that one cannot determine precisely what area of the brain is being activated. For example, perhaps only a portion of a network may be activated, but which part that is may not be known. He said that "in a nutshell, cognitive neuroimaging is still by and large at the 'poking' stage (let's poke here and see what happens) (p. 186)". The neruocognitive studies included in this study (for code-switching and autobiographical memories) poke around at discovering perhaps

general similarities in brain regions so as to plant ideas or to invoke questions for future research.

With regards to code-switching, the leading question that remains unanswered is whether or not there is a 'switch' that controls the bilingual's choice of language. More importantly, if there is a 'switch' for code-switching, in what part of the brain is it located? Research that continues to explore code-switching in both healthy and pathological brains will inevitably bring us closer to understanding the complex phenomenon regarding code-switching.

A multidisciplinary approach, as has been proposed over the years, is essential in order to understand this complex code-switching phenomenon. This section has provided but a glimpse of the large number of studies published over the years. It is not the intention of this study to advocate or discount any one theory, but rather, it is to support various methodological approaches to code-switching, especially in the field of sociolinguistics. Linguists, such as Gardner-Chloros, take a common sense approach to this type of research and advocates for a code-switching database (such as LIDDES) where researchers may contribute and access many examples.

Although our understanding of code-switching has deepened, a unified theory for this field of research remains at large. The contribution of this study is primarily to investigate code-switching in natural conversation in conjunction with autobiographical memories in an elderly immigrant population, which to date remains relatively unexplored. The combination of code-switching and autobiographical memories may provide clues as to how language and memory interact and pattern in the bilingual brain, and perhaps more importantly, the influential strength of language as the vehicle in the recounting of life memories in consecutive bilinguals. In other words, how bilinguals use language when recounting life memories may not necessarily reflect language specificity, but rather may be determined by some deeper structure in our brain that controls not only our languages, but other mental functions as well. The results from this study lead me to believe that there may be an underlying connection between language choice in code-switching and

autobiographical memories, which supersedes linguistic restraints and encoding specificity. A discussion surrounding this will continue in section five.

3   Autobiographical memories: The stories of our bilingual 'selves'

"A different language is a different vision of life"
Federico Fellini (1920 - 1993)
(Cantwell, 1993)

3.1   Introduction

When bilinguals switch languages, do they also switch their 'visions of life'? Do bilinguals see life differently or say things differently according to the language they know and use? Do they feel or act differently based on the language they speak? Fellini said, "A different language is a different vision of life", which may very well symbolize the viewpoint bilinguals have of their lives or their autobiographical memories. It is most likely that bilinguals see themselves differently depending on in what language their memories were encoded. If language imprints our 'vision of life', and our 'vision of life' is captured in our autobiographical memories, and, if our memories include two languages and two cultures, then could we say that bilinguals have two visions of life or two sets of autobiographical memories? Schrauf & Rubin (2003) asked, "Might not the bilingual individual have at least two *curricula vitae*, two chains of associations, two sets of memories" (p. 124)? To understand the connection between memories and language we must first start with the *encoding specificity principle* introduced by Tulving & Thomson in 1973.

   This section begins with a look at defining autobiographical memory. Next is a discussion of the principle of encoding specificity by Tulving & Thompson (1973), followed by a series of studies that looked at the language specificity effect (based on the encoding specificity principle) on bilingual autobiographical memory. This section ends with a summary of recent neurocognitive studies about autobiographical memory.

3.2   What is autobiographical memory?

Before defining autobiographical memory, we turn first to the definition of memory. The Oxford dictionary (Memory, 2011c) defines memory as "the faculty by which the mind stores and remembers information" and "something remembered from the past" (p. 1). Similarly, the Cambridge online dictionary under American English (Memory, 2011b) describes it as "the ability to remember things" (p. 1). Interestingly, the definition for memory under British English (2011c) is slightly more specific; it is "the ability to remember information, experiences and people" (p. 1). Schrauf (2003) described it as "an 'on-line' mental reconstruction of a personal past event that integrates various kinds of information in memory: spatial and sensory imagery, emotion, language, and narrative coherence" (p. 238). Although slight differences are found in the above definitions, the general understanding of the term is clear. For this study, the cues, or questions I asked spanned the life of the participants.

In his book, *Essentials of Human Memory*, Alan Baddeley (1999) summarized memory as "an array of interacting systems, each capable of encoding or registering information, storing it, and making it available by retrieval" (p. 17). He distinguished three broad types: 1) sensory memory (how perception is stored), which includes iconic memory (visual sensory) and echoic memory (auditory), 2) short-term/working memory (temporary storage needed for tasks such as comprehension, reasoning, and long-term memory), and 3) long-term memory (sturdy encoding/storage system), which includes episodic memory (ability to recollect experience) and semantic memory, which he said concerns worldly knowledge (See Chapter 1, pp. 1-18).

Tulving & Thomson (1973) also used the term *episodic memory* (rather than AM) in their study of encoding and retrieval processes and said "episodic memory is concerned with storage and retrieval of temporally dated, spatially located, and personally experienced events or episodes, and temporal-spatial relations among such events" (p. 354). There are some overlapping characteristics between episodic and semantic memory. Tulving (1972) explained the similarities between these two types of memories, but also

highlighted differences and said "Episodic memory refers to memory for personal experiences and their temporal relations, while semantic memory is a system for receiving, retaining, and transmitting information about meaning of words, concepts, and classification of concepts" (pp. 401-402).   Not everyone agrees, however, that autobiographical memory and episodic memory are synonymous.

A thorough investigation of autobiographical memory (bilingual autobiographical memory in particular), was carried out by Conway (1990), who differentiated three types of memory: procedural, semantic, and episodic. He argued for a distinction between episodic and autobiographical memory and said that they "both involve context-bound information and conscious recollection-the experience of remembering-but it is the later type which psychologists have singled out as being autobiographical memories" (p. 5). He also distinguished types of autobiographical memory (personal memory, autobiographical fact, and generic personal memory) in order to categorize varying degrees of each class of memory, saying that the characteristics of these memories are not all or nothing (for a summary of characteristics of autobiographical memory, see Conway, p. 14).

On a more abstract level, Markowitsch & Welzer (2010) said "...autobiographical memory enables individuals to position their personal lives along a continuum of space and time, and to look back to a past that preceded the present" (p. 3). They described autobiographical memory by saying that it is what makes a human '*a human*', and that it requires three things: it has to pertain to the subject, it must have an emotional index, and autobiographical memory must be autonoetic (an awareness of remembering). This, they said, is something that takes time to develop fully and becomes mature when one reaches early adulthood.

Similar to Conway's distinction, Gilboa (2004) revealed substantial differences (and some similarities) in brain activations between autobiographical and episodic memories. He reviewed numerous studies on episodic and autobiographical memory. The results often showed activations in the right mid-dorsolateral prefrontal cortex for episodic memory, which is not found (or rarely found) in the research on autobiographical

memory. Researchers discovered that differences lie in the "mode of post-retrieval monitoring and verification" (p. 1336) or the way you re-experience the memory. Autobiographical memory revolves around the self-schema and the 'feeling of rightness' whereas episodic memory requires more conscious efforts to remember things, such as a list of items learned in experimental conditions. Gilboa suggested that based on the results of the neuroimaging studies reviewed, autobiographical memory should be differentiated from episodic memory as they map onto the brain differently.

Researchers using neuroimaging technology will without doubt continue to provide the research community with great insight into how memory works in the human brain. These results may also shed new light on the mechanisms of autobiographical memory, which is of particular interest to this study (neurocognitive studies will be presented in section 3.4).

3.3   Theory and research in autobiographical memory

3.3.1 The language-specificity effect

We begin by looking at memory and its connection with language, which Tulving & Thomson (1973) referred to as the *encoding specificity principle:* "What is stored is determined by what is perceived and how it is encoded, and what is stored determines what retrieval cues are effective in providing access to what is stored" (p. 353). In theory, there needs to be a connection between the encoded memory and the cue word. In concluding remarks, Tulving & Thomson stated that "...encoding determines the trace, and the trace determines the effectiveness of retrieval cues. The trace itself is simply the link between encoding conditions and the retrieval environment..." (p. 370). Although the experiments on which the authors based their principle involved word list recall in monolingual undergraduates, the basic theory should extend to other situations as well.

In my study, since the participants have, in essence, two sets of memories (pre-immigration memories from Italy and post-immigration memories from Canada) and two

languages (Furlan and English), the language of the 'cue' word (i.e. Furlan) should prompt a memory connected to that language (i.e. a memory from Italy). The following studies reflect this basic principle of language-specificity (language-dependent memory) as it pertains to consecutive bilingual speakers.

3.3.2   Bilingual autobiographical memory research

Great strides have been made over the past ten years in the field of bilingual autobiographical memory. Many interesting studies by researchers such as Robert Schrauf, David Rubin and Viorica Marian have taken Tulving &Thomson's *encoding specificity principle* further to illustrate the connection between language and memory in bilinguals. The following studies, which provide support for language-specificity, are ones most relevant to this study. We will begin with a look at the work by Schrauf and colleagues.

   Schrauf (2000) argued that memory retrieval in consecutive bilinguals is influenced by language or what is defined in the literature as encoding specificity. After reviewing several cued recall studies and psychoanalytical cases, Schrauf found similarities in all results. He found that the language of retrieval had an effect on a bilingual's autobiographical recollection, which supports the Mother Tongue Hypothesis (when a consecutive bilingual remembers more detail/emotion of early memories if recollection is done via the first language). He concluded by saying "the particular language spoken by a bilingual individual activates a corresponding cultural self, and in turn this culturally-linguistically specific self acts as a filter through which personal memories are retrieved" (p. 413). For summary results of his experimental studies see Table 4.1, p. 393 and for psychoanalytical case studies see Table 4.2, p. 401.

   In a word-cue technique experiment with older Hispanic immigrants (mean age at time of experiment = 65.63, average age at time of immigration = 28), Schrauf & Rubin (2000) found that their memories for events from their country of origin were retrieved in Spanish and memories for events from the U.S. were retrieved in English. The

participants could also discern 'how' their memories came to them, whether in words or concepts/images. They also stated that a bilingual's encoded memories for events from their country of origin may be internally retrieved in Spanish, but discussed in English in conversation. They concluded that "The internal language of retrieval points to an underlying, specifically linguistic, memory that is stable over time and that reflects the language used at the time of encoding" (p. 622). This distinction of internally retrieved autobiographical memory is of great interest and could be investigated in further research.

A further analysis of inner speech and autobiographical memory, which builds on Schrauf & Rubin (2000), was by Larsen, Schrauf, Fromholt, & Rubin (2002). They studied two groups of Polish-Danish bilingual immigrants; early (average age of immigration = 24) and late (average age at immigration = 34). Both groups had spent about 30 years in Denmark at the time of their study, which was important in this study for it provided the ideal control for consecutive bilinguals. Participants were tested individually in each language (one week apart) with 50 cue words. They were asked to associate the cue word to a memory. After each recalled memory they were asked in what language the memory came to them (inner speech). The data confirmed previous studies supporting language-specificity by showing that early memories came to them in Polish and late memories came to them in Danish, as expected.

In the following year, Schrauf (2003) analyzed the way bilinguals could use both languages to trigger memories. Spanish/English bilingual immigrants (mean age at time of immigration = 19.1 years and average age at time of immigration to U.S. = between 4-11) were cued with words from both languages (on separate days) and were asked to talk aloud when thinking about memories pertaining to the words asked. The results showed that visual information played a dominant role in cue word associations triggering memories. In addition, results showed that bilinguals consciously translated cues and used linguistic means (morphological, lexical, semantic etc) in both languages (consciously and subconsciously) for memory/language associations to their autobiographical memories. The idea behind this study was to observe the mental states in which the

bilingual may engage when recalling autobiographical memory. The results showed both languages were involved in the search process.

Schrauf & Rubin (2003) summarized and expanded on the above-mentioned studies and discussed in great detail the idea of language specificity in memory retrieval and the bilingual's 'two sets of memories'. The bilingual immigrant, they argued, experiences two different cultural contexts, each with its own language processing and socialization styles; like having two different worlds or '*linguacultures*'. They proposed that "*encoding* and *retrieval*, the two key structural moments in autobiographical memory, are linguistically marked, if not constitutively linguistic, and that this accounts for language-specific retrieval. What is encoded is an experience, and that experience takes place in some linguaculturally defined space" (p. 138). This follows what Tulving & Thomson declared 30 years prior about the encoding specificity principle.

Three distinctions are made regarding linguistic elements in autobiographical memory by Schrauf & Durazo-Arvizu (2006); explicit content (language clearly re-experienced or remembered), inner speech (thinking aloud when retrieving memories), and propositional thought (when language itself configures remembering). Further, they stated that when recalling memories, one engages in a mental reconstruction of the original event and while some bits of information are vividly remembered, others are more conceptual. Theoretically, they argued, memories that are recalled, regardless of detail, emotion, etc. are tagged by language (for studies of emotion and inner speech in autobiographical memory, refer to Marian & Kaushanskaya, 2004; Schrauf & Rubin, 2000).

Schrauf and colleagues have provided invaluable research regarding bilingual autobiographical memory that supports encoding specificity and language specificity. Similarly, Marian and colleagues have contributed various studies sustaining language dependent memory in bilingual immigrants, which supports language-specificity.

Marian & Neisser (2000) used a word-prompt technique with Russian-English bilingual immigrants to test the influence of language cue words on autobiographical memory retrieval. Two experiments were conducted. The first one investigated language-dependent memory in autobiographical events. The hypothesis was that if the languages

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matched (recall with retrieval), more memories would be accessed. The bilinguals' average age at time of the experiment was 21.8 years. Interviews were conducted individually and in two parts, one in English, one in Russian. The participants then had to review each memory and indicate the language spoken at the time the memory was encoded along with their age at the time. The results supported the connection between language and autobiographical memory retrieval. The second experiment (same aged participants) was designed to investigate which of the two variables (language ambiance, and word prompt language) were responsible for language dependent recall of autobiographical memory. The results showed that both variables contributed to language-dependent memory and that ambiance (or setting) has an independent effect on autobiographical memory retrieval (independent of the word prompt language). Marian & Neisser proposed that "…memories become more accessible when language at retrieval matches language at encoding…any increase in the similarity between the linguistic environments at encoding and at retrieval should facilitate recall" (p. 361).

In 2004, Marian & Kaushanskaya investigated self-construal and emotion in bicultural Russian-English bilinguals. The bilinguals' average age at the time of the experiment was 21 years. Interviews were conducted individually using word cues and consisted of two parts; one part in Russian and the other in English. Similar to the experiment by Marian & Neisser (2000), the participants in the study had to review their memories and indicate their age and the language used at the time of the event. The narratives were coded based on the following variables: number of personal pronouns, number of group pronouns, main character of narrative, intensity of emotion, the valence of positive to negative emotion. For example, there were grammatical differences in the autobiographical memory, which corresponded to culture preferences (individualism verses collectivism) for personal pronouns, first person singular (used when recounting English memories) and first person plural (used when recounting Russian memories). Also, emotion was more intense in the autobiographical memory when the language of encoding matched the language of retrieval than when it did not. Based on their data, Marian & Kaushanskaya proposed that "the bilingual self is mediated by the language spoken at any given time

and that language functions as a vehicle for culture with cultural differences seeping into language and potentially influencing cognitive styles and the self" (p. 197).

Based on the data collected from their study in 2004, Marian & Kaushanskaya (2005) examined the number of code-switches and cross-linguistic transfers in the autobiographical memory recounted. The results showed that there were more instances of code-switching into English when speaking Russian if the memories were encoded in English. As a result, they said "…bilinguals are more likely to code-switch to the other language when the language of encoding does not match the language of retrieval (p. 1483)".

In 2006, Marian & Fausey tested language-dependent memory in autobiographical memory, by way of bilingual learning. Spanish-English bilinguals (average age was 22 years) listened to stories in one language, then the other. The questions that followed were asked in one language then the other and all counterbalanced across participants. The results showed that "memory was more accurate and retrieval was faster when the language of retrieval and the language of encoding matched than when they did not match" (p. 1025). They concluded that language dependency may be found in bilingual learning and that experience with a language may strengthen the linguistic cues in creating language-dependent memory.

The principle of language-specificity was supported throughout the various language-dependent studies discussed above. Although methodologies differed, the principle was generally supported. In the current study, I tested this principle specifically looking at language-dependent recall via the number of memories recounted and the language used in conversation over three time periods. In favour of previous research, my hypothesis was also to observe this effect via the number of memories shared and the language used in conversation when the language matched the time period (similarly to Marian & Neisser, 2000).

3.4 Neurocognitive studies on autobiographical memory recall

In the past twenty years we have seen an increased number of brain image studies targeting memory and its location in the human brain. Results from PET and MRI studies show us that different types of memories engage different parts of the brain. In this next section we will be looking at brain image studies involving autobiographical memory (or episodic memory as some call it) that are relevant to the constructs of this study.

In 1996, Fink, Markowitsch, Reinkemeier, Bruckbauer, Kessler, & Heiss used PET to compare autobiographical versus non-autobiographical episodic memories (from childhood, adolescence, and early adulthood periods) in seven participants aged 21-37 years. For autobiographical memory, the key area of activation was in the right hemisphere, mostly in the temporal cortical areas of the right hemisphere, including activity in the amygdala, hippocampus, parahippocampus, posterior cingulate, and prefrontal and insular cortex areas.

Right hippocampal activation in autobiographical memory recall was also discovered by Maguire & Frith (2003), who in their study, tested young (23-39 years old) and older (67-80 years old) participants useing fMRI (functional MRI). The comparison between groups showed greater activity in the right hippocampal area for the older group than the younger group specifically for autobiographical memory retrieval. Activation was indistinguishable between groups during semantic memory recall. They suggested that the right hippocampus shows age-related effects possibly due to an increase use of spatial processing (in the right hemisphere) in autobiographical memory retrieval in older adults.

A PET study by Tsukiura, Fujii, Okuda, Ohtake, Kawashima, Itoh, Fukuda, & Yamadori (2002) looked at brain activation in autobiographical memory retrieval for three time periods: childhood, adolescence, and recent period. The results supported previous research, which identified the involvement of the hippocampal complex (hippocampus and parahippocampal gyrus) in autobiographical memory recall. Tsukiura et. al discovered that this area showed activation for childhood and recent day memories, but not for adolescence memories. They suggested that the distinction between recent and

past is too simple and that the engagement of the hippocampal complex may be time-dependent.

Greenberg, Rice, Cooper, Cabeza, Rubin, & LaBar (2005) conducted an fMRI study to investigate the involvement of the temporal (medial) and inferior (frontal) lobe regions during the recall of autobiographical memories. Eleven adults (18-25 years) participated in the questionnaire/cue word study. Results showed more activity and a strong functional connection between the amygdale, hippocampus and right inferior frontal gyrus during the recall of autobiographical memories, which was not pronounced in semantic memory.

Rubin (2005) studied one of the senses involved in memory and stated that visual memory plays a central role in autobiographical memory. He examined 11 studies on visual memory loss (most involved occipital lobe damage on both sides). All 11 patients had visual memory amnesia with a near-total loss of autobiographical memory prior to the time of the visual memory loss, including early childhood memories. The results of Rubin's fMRI study that controlled for visual memory revealed activation in the hippocampal formation (during encoding and recalling of memory), in the right parahippocampal cortex (spatial processing) and in the medial prefrontal left hemisphere (knowledge of recalled event). Rubin argues that in order to understand cognition one needs to examine the interaction of the basic systems, one of which is visual memory.

Based on the above studies on autobiographical memory recall, the area of the brain mentioned in each study is the hippocampus or hippocampal area, which is part of the limbic system. Interestingly, this system also includes the basal ganglia and cingulate gyrus, mentioned also in brain image studies about healthy and pathological code-swtching. It is my curiosity that suggests both code-switching and autobiographical memory recall may stem from something shared by all three brain areas mentioned. It could be that one's self-schema is responsible for language use, code-switching, and life memories shared, and that this self-schema is networked in the limbic system. Further research would be necessary in order to verify this curiosity.

4 The interview study on code-switching

...aahm, /*cuand che ai lassât Italia...io...*/I had no regrets
...aahm, *when I left Italy...I...*I had no regrets
(personal communication)

4.1 Introduction: What this study is about

It was a growing curiosity regarding language switching that initiated this current study. Having grown up with Italian immigrant parents, I had always heard Furlan and English used in daily conversation. To my ear, the two languages they used were perceived as one, which I thought was perfectly normal. Since language switching was frequently heard in conversation and their conversations most often entailed stories about their life in Italy, I decided to incorporate code-switching and autobiographical memory into one study. It seemed like a natural combination.

So this study is about looking at a bilingual's life story from two different disciplines, code-switching and autobiographical memories, and to compare my findings with existing studies, sociolinguistics and neruoscience, in order to discover patterns of similarities and differences. Each topic is vast and rich in data, but the combination of each into one study is not. To my knowledge this type of research shares no literature until this study, and it is hoped that by looking at code-switching and autobiographical memories together in naturally occurring conversation among concurrent bilinguals, researchers will perhaps discover more about how the bilingual mind works regarding language and memory.

This study is also about documenting (and archiving) language, especially a language like Furlan that may not be spoken for much longer in Hamilton, Ontario. It is about recording life stories as spoken by the elderly immigrants from the Friuli region of Italy and giving back to them a written copy of these stories that preserves their cultural history.

Immigrants, who go to a new country and learn a new language, are perfect candidates for this type of study as their "...monolingual/monocultural minds become

bilingual/bicultural minds via immigration" (Schrauf & Durazo-Arvizu, 2006, p. 297). Prior to immigration, all memories of life in their country of origin (Italy) would have been encoded in their mother tongue. After immigration, memories may be encoded in either their mother tongue or their newly acquired second language. According to the encoding specificity principle for AM, I expected my participants to recall memories of their life in Italy in Furlan, especially when cued with Furlan prompts and that there would be infrequent code-switching. Contrarily, if the participants are cued with English prompts about their memories of Italy, I expect that fewer memories would be recalled for that time period and that code-switching would be frequent. If the trace to the memory is strong then the likelihood of recalling the memory is also strong. In other words, Furlan cues pertaining to life in Italy should elicit richer memory recall and less language switching since there is not a mismatch in languages.

The section begins with some examples of the dialectal differences evident within the Furlan language, which largely depends on the location of where one grows up. The major part of this section deals with the purpose, the participants, the methodology, and discussion pertaining to each objective.

4.2 Furlan dialects: Examples of regional variations

Several dialects of the Furlan language are spoken throughout the Friuli region, which Pellegrini (1972) has extensively documented in the *Atlante Storico-Linguistico-Etnografico Friulano*. The two areas of Friuli where the majority of the participants came from would likely speak a dialect of Furlan typically heard in the cities of *Pordenone* and *Udine*. Although somewhat different, they are mutually intelligible. Some words are similar between the two dialects, for example, for the Italian words *'lampeggia'* [lightening]*, 'una nuvola'* [a cloud] and *'fa tanto caldo'* [it is very hot], in *Pordenone* they would say '*al lámpiʃéa'*, *'núvula/núvuliś'* and *'tant čált/un čált del diáŭ'* and in *Udine* they would say '*al lámpe'*, *'nūl/nūi̧* and '*al é tant čált'*. Some words are not similar. For the Italian word '*la nebbia'* [cloudy], in Pordenone they would say '*kalígu'*

and in Udine they would say '*fumáte*'. The conversations in this study were recorded and transcribed verbatim as spoken by each participant regardless of dialectal variation used. This was done in order to preserve all variations of Furlan spoken by the participants living in the Hamilton area.

For the purpose of this study, the investigation of the languages used throughout the conversations will be parsed according to English and non-English words only. Included in the category of non-English words are Furlan (any dialect), Italian, and a few French and Spanish words found in two conversations. All non-English words will be referred to as 'Furlan' for this study. A future study regarding code-switching between Italian dialects or between Italian dialects and standard Italian could be performed to test the principle of encoding specificity, but this is beyond the scope of this study.

4.3 The purpose, participants and methodology for this study

4.3.1 The purpose

For this study, I wanted to investigate whether or not I would observe language-specificity in the recounting of autobiographical memories by elderly immigrants. I was curious to know whether consecutive bilinguals would recount earlier memories in their mother tongue (Furlan) and later memories in their second language (English), as many studies on autobiographical memory have previously found. I also wanted to know if the language I used during the interview (Furlan, English or both) would influence the language selected by the participants during their conversation about their autobiographical memories. For this reason, three groups were formed based on the language used during the conversation: *Furlan*, *English* and *½* (includes both Furlan and English). In theory, if the memories are encoded in the language used at the time of the memory (i.e. Furlan), then I expect to observe language-specificity throughout their conversations. Further, I expect to see a tendency for participants to code-switch if there is a mismatch between the language of the encoded memory and the language of the

interview questions. Specifically, the autobiographical memories prior to immigration would have been encoded in Furlan and therefore, my questions asked in English would result in more code-switching from English to Furlan. Contrarily, I would expect that memories after initial immigration (i.e. several years after) would be encoded more in English, perhaps, and therefore, my questions asked in Furlan should result in more code-switching from Furlan to English. Memories from around the time of the first or second year of immigration could have been encoded in either Furlan or English depending on personal factors (their willingness to accept the new language, for example) and therefore the code-switching in response to my questions would vary between speakers and languages used. The four main objections in this study were as follows:

- **To record natural conversation in order to observe and quantify the number of memories shared and the languages used (Furlan or English) by elderly Italian immigrants in their recounting of autobiographical memories. The data will be explained in terms of language-specificity (based on the encoding specificity principle byTulving & Thomson, 1973).**

- **To quantify and highlight the overall instances of code-switching in the recorded conversation per group per time period and observe the data on two levels: a) *within* the single speech turn for each participant, and b) *between* the speech turns of the participants.**

- **To analyze and compare instances of code-switching in bilingual autobiographical memory recall to the total number of recounted memories over the time periods *Italy, Time* of immigration, and *Canada*.**

- **To investigate (very briefly) the distribution and frequency of the discourse markers (DMs) '*sì*'and '*yeah*' per group per time period as they relate to language-specificity and code-switching.**

4.3.2 The participants

The participants were selected based on the following criteria:

- they had to have immigrated to Canada after WWII (late 1940's—1960's) making them >50 years old,
- they had to have been able to speak and/or understand Furlan and English and able to complete the interview in either language,
- the interview pairs had to have been comfortable talking with each other (i.e. very good friends or family members)
- all participants had to be residing in the Hamilton area.

 These criteria were important in order to control for as many extraneous factors as possible.

   Twenty-one Furlan-English bilinguals (10 males, 11 females), from the Hamilton area, took part in this study and 12 conversations were recorded. Participants mean age at time of immigration was 16.5 years, the youngest was four years old and the oldest was 30 years old. Most of them came to Canada between 1950 to 1960. All participants were over the age of 50 and 62% were 71+ years old. When asked which language they enjoyed speaking most, 76% said Furlan (some Italian). Some of the reasons given by the different participants about 'why' they enjoy speaking Furlan are listed below:

"it brings happy thoughts"
"it brings me back to my roots"
"it's important in discovery of self"
"it's my mother tongue"
"it's good when you want to speak in private"
"because it doesn't get used much, so I like to keep in practice"
"I'm used to it, it's easier"
"it comes more easily"
"it's spoken by most family and friends"
 (personal comments from questionnaire).

When asked which language was easier to speak, 62% said Furlan (some Italian). Reasons given by the participants about 'why' they found Furlan easier to speak include the following:

> "it was learned as a child"
> "have spoken it the longest"
> "it's easier to speak to friends"
> "it comes natural"
> "that's how I think"
> (personal comments from questionnaire).

Twelve participants finished school before grade six (one finished grade four, nine finished grade five and two finished grade six), the remaining nine finished school at different grades, ranging from grade eight to university. All immigrated to Canada from the Friuli-Venezia Giulia region of Italy and all spoke Furlan as their first language (See Appendix A for participants' demographic information). Although they may have grown up speaking different dialects of Furlan, they would have been understood by other Furlan speakers (for the most part). The participants came from the southern part of the region and include the following towns:

> Biauzzo, Udine
> Gorizzo, Udine
> Lavoredo di Varmo, Udine
> Majano, Udine
> Pozzo, Udine
> Ramuscello, Pordenone
> Rivignano, Udine
> Roveredo di Varmo, Udine
> San Daniele, Udine
> San Lorenzo, Udine
> S. Vito Al Tagliamente, Pordenone
> Zompicchia, Udine

(The circle on map in Figure 4.1 indicates the region of Italy my participants are from).

Map of Italy-Friuli Region Enlarged
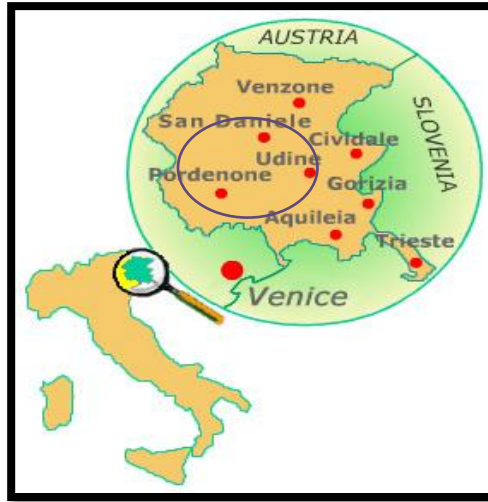
Figure 4.1   (Discover Friuli, n.d.)

All participants were interviewed in pairs except one, whose wife was not Italian (so he chose to be interviewed alone). The relationship between the pairs included: spouses (five pairs), friends (two pairs), and siblings (three pairs). Again, it was important that participants knew each other very well in order to create as natural a conversation as possible.

4.3.3. The methodology

The experiment consisted of two parts, an interview and a short questionnaire. Each interview, between two participants and me was video recorded. I decided to limit the interview to three people in order to lessen conversation overlap since it is difficult to transcribe with complete accuracy. In addition, by limiting it to two participants it would reduce the psychological distress that recalling autobiographical memories in a group situation might have on them, which in return would elicit more autobiographical memories. In previous research[4] this method worked well to increase overall comfort

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[4] This was done for a final year-end project for the course Ling. 4I03, which had been approved by the McMaster's Ethics Board.

levels and the quantity of recalled memories. The interviews were conducted at the Famee Furlane Club in Binbrook, Ontario, since most of the participants were members there.

The questions asked during the interview were in Furlan, English, or both. The minimum number of participants was five for each group. One group heard all the questions in Furlan, another group heard all the questions in English, and the third group heard questions in both languages (Furlan for the time prior to immigration and English for the time after immigration). The allocation to one of these three groups was random. The types of questions were general and non-personal. All questions were meant to elicit memories about different points in their life before, during and after they immigrated to Canada. The main purpose for asking these questions was to find out which language they would use when recounting their autobiographical memories. By dividing the participants into three groups, I could observe whether or not the language of the question had an effect on their choice of the language used in conversation, and if this had an effect on the number of memories recounted from each time period.

Once the interview was over, we took a short break after which a brief questionnaire was given to each participant. Questions included Likert-scale and open-ended questions. The interview took between 45 minutes to one hour and the questionnaire took approximately 20 minutes. The purpose of the questionnaire was to collect additional biographical information about the participant (gender, place and year of birth, for example) and to find out from the participants how often they use/used their L1 and L2 languages. The frequency of use for each language was collected in the Likert-type scale questions in the questionnaire, which had been structured to mirror the questions used in the interview. It was anticipated that what participants say they use and what they actually use may not be the same. The questionnaire reflected controlled language use, while interview conversations reflect spontaneous language use or discourse.

The issues with terminology are not only evident in code-switching studies, they are found in discourse as well (see Mills, 1997). The Oxford Dictionary (Discourse, 2012b) defines discourse as "written or spoken communication or debate" (p. 1) and the Cambridge Dictionary (Discourse, 2011a) defines it as "communication in speech or

writing" (p. 1). These definitions are very broad and leave much room for discrepancies and interpretations. Schriffrin, Tannen & Hamilton (2001) summarize this by saying "so abundant are definitions of discourse that many linguistics books on the subject now open with a survey of definitions" (p. 1). They added that the definitions usually fall under these three main categories "(1) anything beyond the sentence, (2) language use, and (3) a broader range of social practice that includes nonlinguistic and nonspecific instances of language" (p.1). Woods (2006) described it well by saying that discourse is "at the very least, language plus context…that includes our experience, assumptions and expectations…" (p. x). There are many ways to examine discourse analysis in this line of research; however, for this study, discourse will be observed at face value and following Woods' criteria since it best suits the experiences and contexts of the elderly immigrants in the study.

4.4 Data analysis and results

The results from this experiment will be reported with respect to the four main objectives presented above, and will include the data from both the questionnaire and the interview. Since I am looking at language use in conversation and since the overall synthesis of the experiment is multifaceted, the results will be discussed in stages, starting with the overall analysis for each objective, then the specific outcomes for each group (Furlan, English, both), and each time period (pre-immigration, immigration, and post immigration). I will present the outcomes as they pertain to the theoretical constructs of code-switching and language-specificity.

4.4.1 Objective one: Autobiographical memory and language-specificity

The first objective was to record natural conversation in order to observe and quantify the use of languages in the recounting of autobiographical memories (Furlan and English) by elderly immigrants from the Friuli region of Italy. We begin with a look at the frequency

of use for Furlan and English for the three time periods as reported by the participants on the questionnaire[5]. Since some participants came to Canada when they were very young, some of the questions asked about their use of language were not applicable since their schooling was done in English.

The reported frequency of use for Furlan (figure 4.2) reflects the amount of Furlan language used at home at different points throughout the life span of the participants.

Reported Frequency of Use for Furlan Over the Life Span

	0-4 yrs	5-11 yrs	Teenager	Young Adult	Canada 1st yr	Canada +5 yrs	Canada +10 yrs	Canada +20 yrs	Canada Nowadays
■ Never					1				
■ Rarely				4	1	3	3	5	7
■ Often			1		1		1	6	4
■ Half the time			1	2	1		7	3	3
■ Very often			2	2		4	2	1	
■ Most always	1	2	1		3	6	4	3	6
■ Always	20	19	16	13	14	8	4	3	1
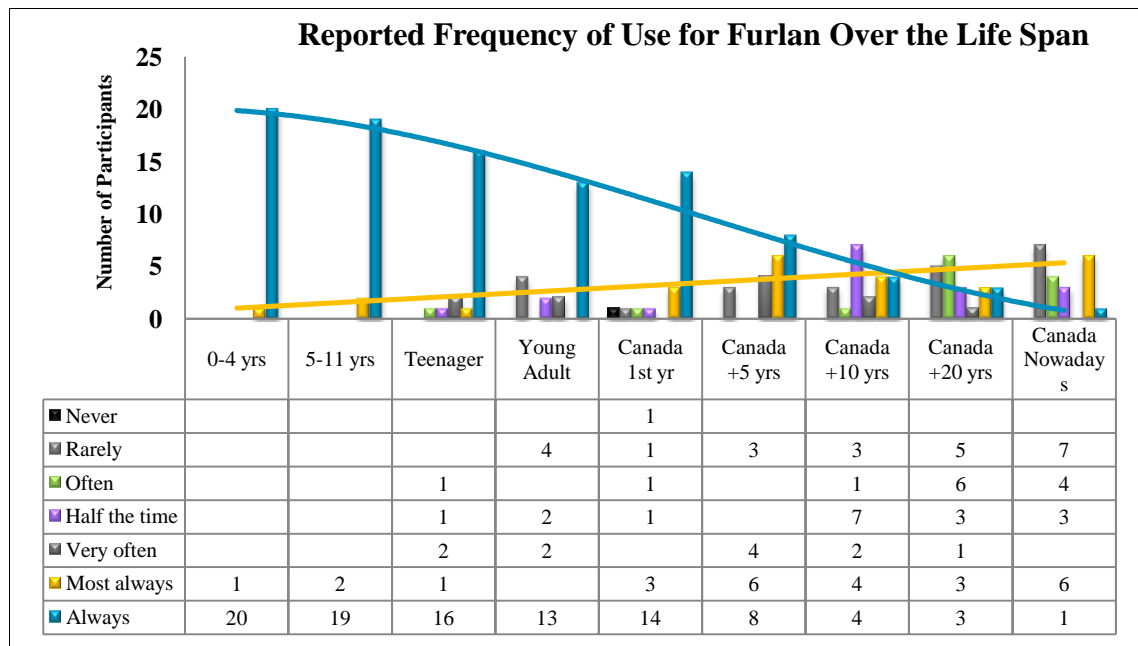
Figure 4.2 *Note*: These results were from the Likert-scale questionnaire questions.

As expected, the trend for 'always' (blue line) for frequency of use for Furlan shows a steady decline over the years as the participants learned and used English in their daily life. Interestingly, the trend for 'most always' (orange line) shows an increase in the frequency of use by the participants in their later years. Seven participants (33%) reported that they use Furlan 'always' or 'most always' nowadays and 10 participants (almost 50%) reported that they use Furlan 'half the time' or more 'nowadays', which is very significant considering their age at the time of the study (+70 yrs). In addition, the participants who reported a greater use of Furlan in their later years, immigrated to

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[5] For a list of questions asked during the interview see Appendix B, Figures (a) & (b).

Canada in their late teens or early adult years, those who did not, immigrated to Canada when they were much younger. It appears that age of immigration may have been a factor in L1 retention and use.

The following graph (figure 4.3) shows the reported frequency of use for English at home since immigrating to Canada. As expected, the general trend for 'always' (blue line) for frequency of use for English shows a steady increase over time as the participants used English for work and daily living. What is interesting, however, is that 'nowadays' 8 participants (38%) report using English half the time or less. We see similar results in figure 4.2 where 10 participants (50%) reported using Furlan half the time or more 'nowadays'. These results are significant in that they reflect the participants' actual reported use of Furlan and English 'nowadays'. The fact that almost half the participants use their L1 half the time or more is important and should be investigated further, especially since seniors require more assistance with services (healthcare, for example) and the language they choose, or are able to speak, may not be English.

Reported Frequency of Use for English After Immigration to Canada

	Canada 1st yr	Canada +5 yrs	Canada +10 yrs	Canada +20 yrs	Canada Nowadays
■ Never	4	3	0	0	0
◩ Rarely	10	4	3	0	1
■ Often	0	3	5	4	2
■ Half the time	2	7	8	6	5
◪ Very often	0	1	2	2	2
■ Most always	4	2	3	8	5
◪ Always	1	1	0	1	6
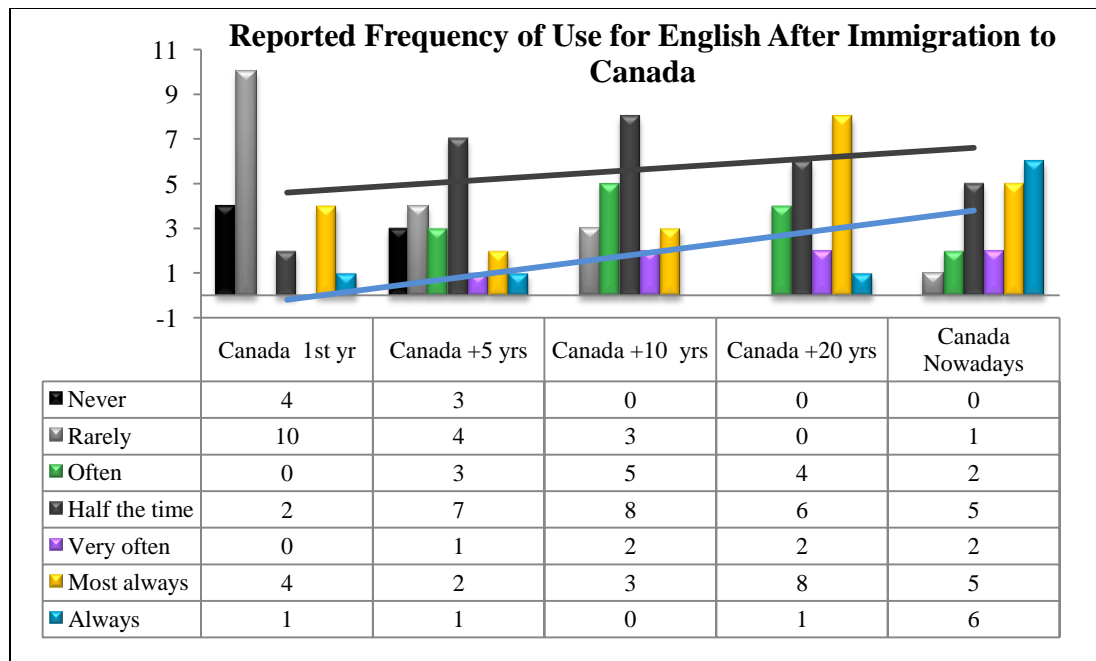
Figure 4.3 *Note*: These results were from the Likert-scale questionnaire questions.

The research on language attrition is extensive, but results are mixed regarding L1 or L2 attrition, reversion (returning to L1) and general cognitive decline. Schmid & Keijzer (2009), Keijzer (2011) and Köpke (2004) found smaller attrition effects in older immigrants (72+ years of age), than younger immigrants (< 71 years) indicating L1 reversion. A comprehensive look at variables in L2 attrition is discussed by Bardovi-Harlig & Stringer (2010) in hopes of establishing a theoretically sound base for research in L2 attrition. In his review of Gullberg &Indefrey's book *The cogntitive neuroscience of second language acquisition* (2006), de Bot (2008) cautions readers about the shortcomings of neuro-imaging studies regarding multilingual processing. Several factors contribute to L2 acquisition and bilingualism in general (as discussed in section two), which makes research in L1 and L2 attrition rather challenging.

If defining bilingualism is difficult, since many factors contribute to its development or progress, then how can we determine which language remains stronger and which language is forgotten in one's later years of life? From the questionnaire, as mentioned, almost 50% of the participants in the study reported that they use Furlan half the time or more 'nowadays'. Also, based on the conversations transcribed, eight to ten participants (approximatelt 43%) used Furlan to discuss their autobiographical memories over all three time periods. So, their reported use and their actual use were somewhat similar. Regardless of the level of 'bilingualism' they may have reached during their lifetime, half of them use Furlan and half of them use English half the time (or more). How can we tell which language they have lost or retained nowadays?

Making conclusions about language attrition in elderly bilinguals may or may not represent the reality of actual language use in later years. Observing and documenting elderly bilinguals in natural conversation (as was done in this study) gives a more accurate representation of actual language usage. Since 33% of the participants in my study reported that they use Furlan 'always' or 'most always' nowadays it shows us that we need to consider the importance of L1 frequency in the aging immigrant populations and not assume that their L2 will be their dominant language. We need to take notice of studies (such as this one) that investigate reported and actual language use in order to

better accommodate all aging bilinguals in our society regardless of which language is lost first or second.

   Next, we will examine the data from the transcribed conversations in order to observe whether, or not, the data support language-specificity, and also to compare actual language use to reported use of English and Furlan which participants self-reported on the questionnaire.

   As mentioned, the interview questions were patterned similarly to the ones found in the questionnaire. An overall analysis of the data will be discussed first, followed by the breakdown for each group and each time period[6]. The main hypothesis regarding language-specificity is that the language of retrieval will have an effect on the number of autobiographical memories recalled by the bilinguals interviewed (Shrauf, 2000). In other words, more memories will be recalled when there is a match in the language used at the time of retrieval to the language used at the time of encoding.

   We begin with a look at the total number of memories recounted for each group for each time period. These numbers were based on the sum of the total word counts of the participants in each group and include both languages, Furlan and English. As shown in Table 4.1a (with +/-), it was expected that the participants in the *Furlan* group would recount more memories from their life in *Italy* (language match), the *English* group would recount more memories from *Canada* (language match) and the *½* group would show a similar number of memories for *Italy* and *Canada* when the languages matched. Based on the sums for each group for each time period the forecasted prediction was not supported (see Table 4.1b). In fact, the opposite was true. Based on the group's total, the *Furlan* group recounted more autobiographical memories from their life in Canada, the *English* group recounted more autobiographical memories from *Italy*, and the *½* group recounted more autobiographical memories from *Canada*, which partially shows the effect (to see each participant's total word counts, see Appendix C). Looking at the total sums for each group, we see that the language-specificity effect was not supported. In other words, the

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6 One conversation was removed from the data since parts of the discussion were unclear and too difficult to transcribe; the total number of conversations for this section was ten.

language I spoke during the interview did not influence the number of memories
recounted by the participants.

Table 4.1a **Predicted Time Periods With the Highest Number of Memories Per Group**

	Italy	*Time*	*Canada*
Furlan Group	+	-	-
English Groupl	-	-	+
½-Group	+	-	+

Note: a) The headings Italy, Time (Time of Immigration), and Canada refer to the three time periods analyzed in this study.
b) The highlighted boxes with the [+] indicate the time period where I expected more memories to take place per group. For the ½ group, I expected similar counts between the two time periods, Italy and Canada.

As shown in Table 4.1b, the sums for each group did not match the forecasted prediction shown in Table 4.1a. Contrastively, based on the sums of words per group, per time period, the *Furlan* group shared more words for *Canada* (5724), the *English* group shared more for *Italy* (8400) and the ½-group shared more for *Canada* (14541), which partially supports the prediction.

Table 4.1b **Actual Number of Memories Per Time Period Per Group**

	Italy	*Time*	*Canada*
Furlan Group	5087	4424	5724
English Group	8400	6903	7338
½-Group	11032	8539	14541

Note: The highlighted boxes indicate the higher number of memories per group. The only box that supported the prediction was for the ½ group and the total recalled memories for Canada (circled in red).

The following graph (Fig 4.4) shows the average number of words recounted per group per time period. On average, the *Furlan* group recounted more memories for the *Canada* time period, The *English* group recounted more for *Italy*, and the ½-group recounted more for *Canada*.

Average Percentage of Total Memories Per Group Per Time Period

	Furlan	English	1/2-
Canada	37.6%	32.4%	42.6%
Time	29.0%	30.5%	25.0%
Italy	33.4%	37.1%	32.3%

■ Italy □ Time ■ Canada
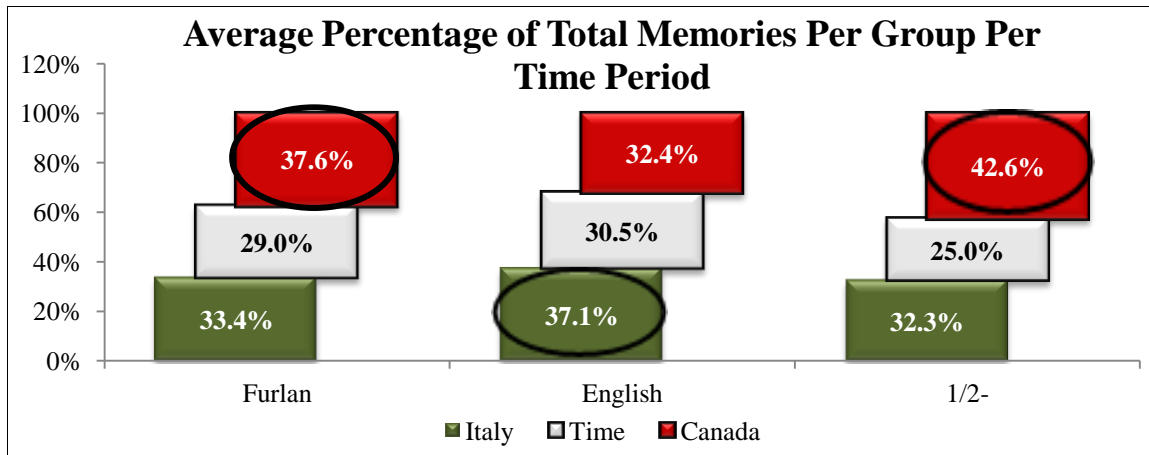
Figure 4.4 *Note*: The circled totals highlight the time period with the greatest number of memories shared

The average numbers per group still do not support the prediction made; however, the totals were relatively close in number for each time period, so I felt that a further analysis was necessary.

The percentage ratios of memories per person per time period were analyzed, based on the total word counts of each (See Table 4.2 for percentages and Appendix B for totals); interestingly, a slightly different picture emerged. In the *Furlan* group, two participants recounted more memories from *Italy* (reflecting language-specificity)*,* one recounted more from *Time* of immigration, and two recounted more from *Canada.* In the *English* group, three participants recounted more memories from *Italy*, two recounted more from *Time* of immigration, and one recounted more from *Canada* (reflecting language-specificity). In the *½*-group, three participants recounted more memories from *Italy* (reflecting language-specificity for Furlan), two recounted more from *Time* of immigration, and three recounted more from *Canada* (reflecting language-specificity for English). Based on the total number of words or memories shared during the interview conversation (both languages included), almost half of the participants (9 out of 19 or 47%) demonstrated language-specificity. In other words, 47% recounted more memories for the time period when there was a language match.

Table 4.2   **Percentage Ratios of Memories Per Person Per Time Period**

		% Italy	% Time	% Canada
Furlan Group	Fur-A-S	41.2	25.7	33.1
	Fur-A-I	42.9	30.8	26.3
	Fur-B-G	21.9	26.4	51.7
	Fur-C-Ge	28.8	45.3	25.9
	Fur-C-Gi	28.7	27.3	44
	Number of participants with highest % of memories per time period	2	1	2
English Group	Eng-A-N	40.9	42.7	16.4
	Eng-A-D	9.2	28	62.8
	Eng-B-B	52	33.6	14.4
	Eng-B-L	21.5	42.8	35.7
	Eng-C-0	42.5	16.2	41.3
	Eng-C-L	48.1	14.1	37.8
	Number of participants with highest % of memories per time period	3	2	1
½- Group	1/2-A-S	44.2	26.1	29.7
	1/2-A-A	23.5	38.3	38.2
	1/2-B-R	29.9	35.5	34.6
	1/2-B-E	17.6	33.6	48.8
	1/2-C-M	48.5	11.1	40.4
	1/2-C-A	46.4	15.1	38.5
	1/2-D-A	17.7	11.3	71
	1/2-D-M	14.8	28.2	57
	Number of participants with highest % of memories per time period	3	2	3

Note: The highlighted boxes indicate the time period showing the higher percentage of memories recalled per participant. (See Appendix B for the actual totals per person per time period). The red boxes represent the time periods where it was predicted that there would have been a greater number of recounted memories thus supporting language-specificity.

As is apparant from the data from each group, the time period with the highest percentage of words or memories varied between speakers. This shows us that, for some participants, language alone may not have been enough to trigger more memories when the language matched the time period in which the memories were encoded. It is worth mentioning that for the groups *Furlan* and *½*, almost 40% of the participants (5 out of 13) shared more memories of their life in *Italy* when they heard the interview questions from

that time period in Furlan. This time period is of special interest in the data analysis because the only language known to the participants at that time was Furlan; no English encoded memories would have been remembered then. Therefore, the memories shared by the participants in the groups *Furlan* and *½* for the time period *Italy* should exemplify language-specificity, in the sense that their early life memories would have had one linguistic tag, which is Furlan. My use of Furlan, in theory, should have elicited a greater number of early memories from the time period Italy from more participants in those groups. Instead, 40% demonstrated language-specificity in their recall of memories, which warrants further investigating in order to answer the question of why some participants demonstrated language-specificity while others did not.

The results so far show us that based on the total word counts, language-specificity was supported by some participants (but not all) who shared more memories from the time period when the language I used for the interview (language ambiance) matched the time of memory encoding. Since no differentiation of use between Furlan and English by the participants was shown, a further parse was necessary to analyze language use in order to observe whether, or not, the language I used during the interview influenced the choice of language used by the speakers in conversation. I wanted to know if the speakers would use Furlan if I asked them questions in Furlan, for example.

The results in figure 4.5 indicate that the *Furlan* group used more Furlan than English for all three time periods, the *English* group used more English than Furlan for all three time periods and that the *½*-group used more Furlan for memories of *Italy* and more English for memories of *Time* and *Canada*.
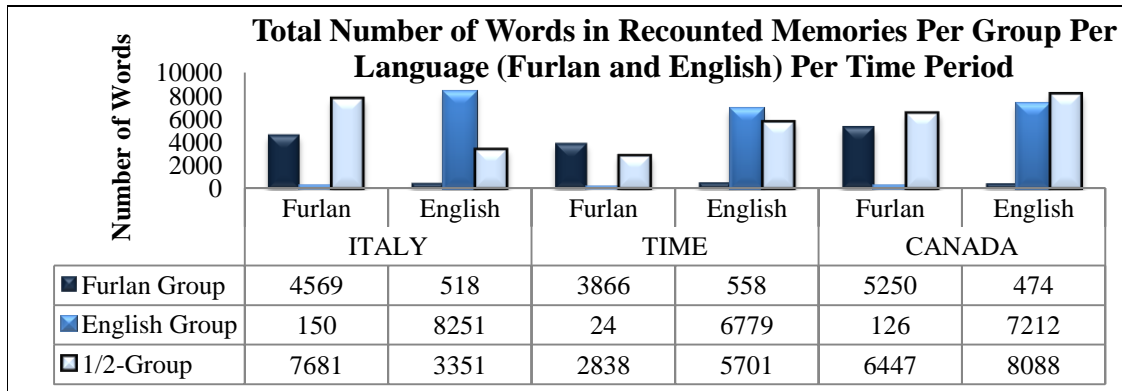
Figure 4.5

The results in Figures 4.6, 4.7, and 4.8 illustrate more clearly the language used (Furlan or English) per participant per time period in their recall of memories. The numbers outlined in red represent each participant's higher totals, which seem to pattern similarly across all three time periods (with some variation in the ½-group).

Figure 4.6

Figure 4.7

	Fur-A-S	Fur-A-I	Fur-B-G	Fur-C-Ge	Fur-C-Gi	Eng-A-N	Eng-A-D	Eng-B-B	Eng-B-L	Eng-C-0	Eng-C-L	1/2-A-S	1/2-A-A	1/2-B-R	1/2-B-E	1/2-C-M	1/2-C-A	1/2-D-A	1/2-D-M
▪ Furlan	919	1131	2419	246	535	3	56	2	1	53	11	101	82	659	921	2094	1580	940	70
▪ Eng	131	82	152	48	61	731	1830	681	1228	1947	795	786	1805	1208	1190	168	573	940	1418
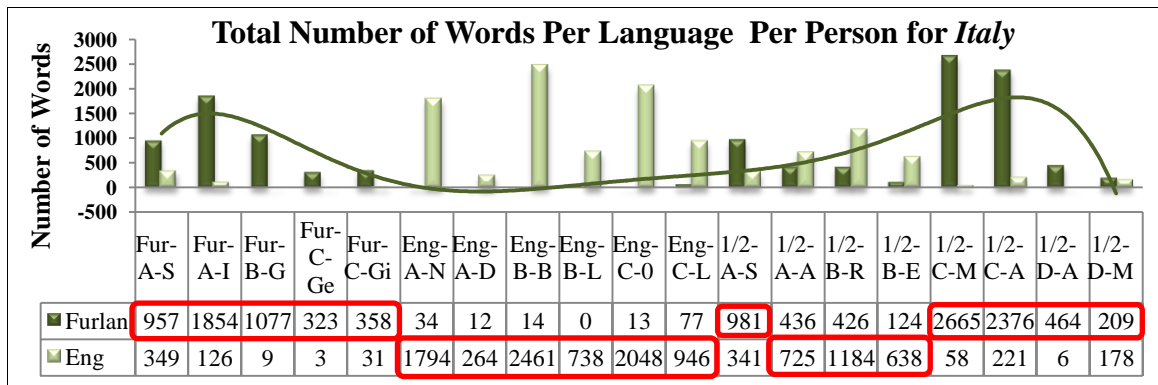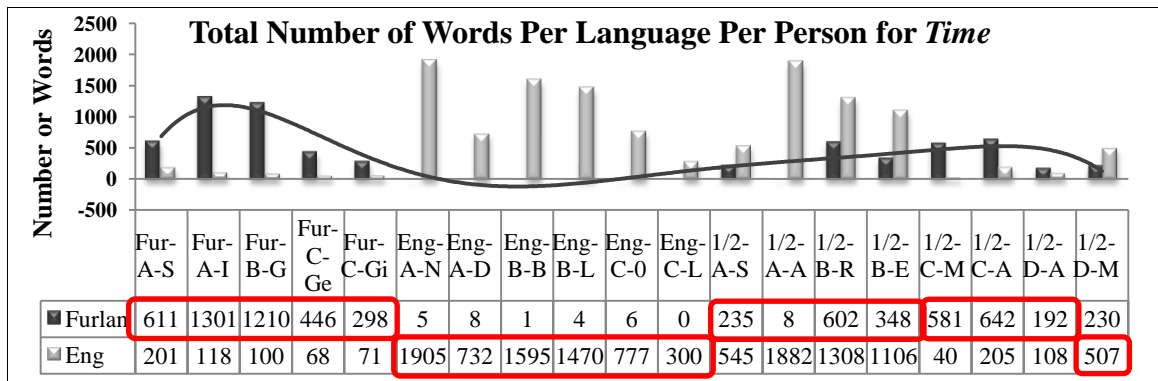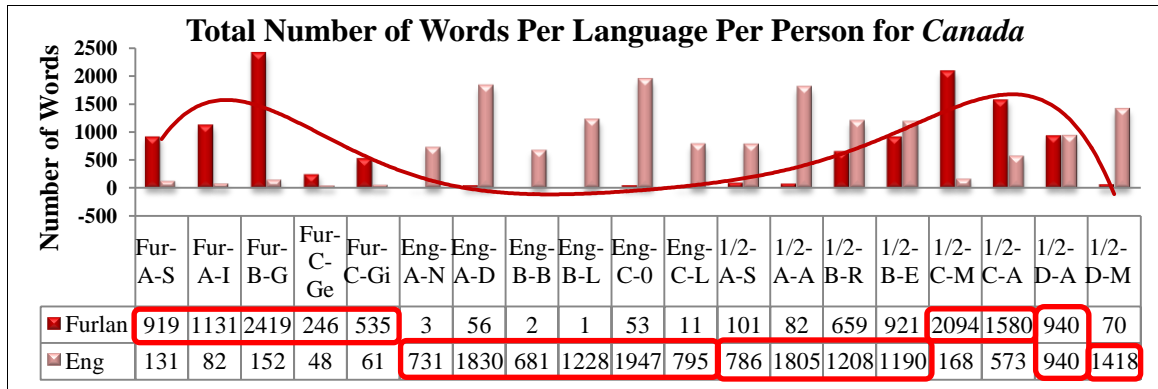
Figure 4.8

Regarding the information from the above graphs (figures 4.6, 4.7, and 4.8) a clear pattern is observed in each group. When memories were recounted in conversation, the *Furlan* group used more Furlan than English in all three time periods, the *English* group used more English than Furlan in all three, and the ½ group varied. Three participants used the same or more Furlan than English for all three time periods, three used English more for all three time periods and the remaining two use more Furlan when discussing memories of *Italy* and more English when discussing memories of *Time* and *Canada*.

This signifies that based on the sum of totals for Furlan and English, for each group and for each time period, the language I used during the interview influenced the choice of language used by the participants. When I spoke only Furlan, the participants used mostly Furlan, when I spoke only English, the participants used mostly English, and when I switched Furlan and English half way through the interview, some used Furlan throughout the interview, some used English and some switched when I switched. It appears as though, for the most part, the participants chose a *language mode* in which to discuss their memories and remained in that mode for the entire conversation, with the exception of the ½-group. In that group, two participants (25%) recounted their memories in the language that matched the time period, supporting language specificity. They used Furlan to discuss memories of *Italy* and English to discuss memories for *Time* and *Canada*. The remaining six participants (75%) chose a language mode to discuss their memories and remained in that mode for all three time periods.

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One further note, the actual use of language by the participants was similar to their reported use declared on the questionnaires. As stated earlier, almost half of the group, or 48%, reported that they use Furlan half the time or more nowadays. Based on total word counts of Furlan and English used in the conversations, 43% of the memories were recounted in Furlan. This similarity between reported use and actual use is interesting for it demonstrates greater validity in self reporting in questionnaires; a method some researchers consider unreliable.

4.4.1.1 Can we determine that language-specificity was supported?

Several observations are summarized corresponding to the data presented:
1) Language-specificity was **not evident when the analysis was based on group totals** (except the ½ group for the time period *Canada*).
2) **Language-specificity was evident with approximately 40% of the participants** when each individual's total number of memories were analyzed (both languages included).
3) When languages were parsed, most participants used the same language as the interview questions to recall their life memories.

This shows us that there is a linguistic influence on the choice of language used by the interviewees, which when taken at face value, does not really support language-specificity (Schrauf & Rubin, 2003) or does it? Depending on the results of one's data analysis, it could be interpreted in one of two ways. One could say that based on overall totals for each group, language-specificity was not found. If individual scores are discussed, then almost half showed this effect. If the analysis relies on language use in recalled memories only to determine language-specificity, then this effect is not strongly supported. This may indicate that the language used to recall memories may not necessarily be the one in which the memories were originally coded.

In their study of Polish-Danish speakers, Larsen et. al (2002) found that "bilinguals may mentally retrieve a memory in one language and narrate it in another. In other words, there may be an internal language of retrieval that differs from the external language of report" (2002, p. 46). Interestingly, the Polish-Danish speakers were older immigrants who had immigrated as young adults, which corresponds somewhat to the participants in my study. Perhaps the age of immigration is a factor to consider in language-specificity. Many studies which support language-specificity were based on interviews with participants who were young adults at the time of the interview (20-25 years of age).

Since my study dealt with older immigrants and the length of time spent in the L2 environment was much longer, the results may be different than most studies on autobiographical memory. In that case, we can only discuss language-specificity as it relates to the recalled memories shared by the participants in my study, which may not reflect the results as seen in the above mentioned studies. Also, because I did not formally ask the participants in what language the memories came to them, I can only observe the actual language used in the conversation in the recounting of autobiographical memories. A follow up study is necessary in order to verify language-specificity at a deeper level than what was used and analysed in this study.

4.4.2 Objective two: Code-switching *within* and *between turns*

The second objective was to quantify and highlight the overall instances of code-switching in the recorded conversations both *within* the turns of each speaker and *between* the turns of the participants in each conversation. Since this study looks at 'conversational' code-switching, it was necessary to observe both types of switches in order to detect similarities and/or differences in frequency or type when both speakers were included in the analysis. All types of switches counted as a code-switch, including discourse markers and tags such as 'yeah', 'ok', 'sì', 'no' and 'you know'.

The analysis for this objective will be discussed in two parts. Part one is based on a small sampling of code-switching examples, which were taken from each group for each

time period, and the second part is an analysis based on the entire data collected in the study. Since code-switching can be triggered by various words and phrases etc., I underlined all words before and after the switch points and labelled these words according to their grammatical category. I have also parsed the switches based on an initial switch (Switch 1) and the switch back (Switch 2) for both *within* and *between* turns[7]. I wanted to observe whether or not there was a difference in grammatical categories involved with switching language direction in speech, or any other general patterns between the two.

   In part one, the first set of examples (Set One) illustrates code-switching *within* turns, which is most often discussed in the research, and the second set (Set Two) looks at code-switching *between turns*. Each set (one and two) incorporates excerpts from each group and are listed in the following order; (A) examples from *Furlan* (B) examples from *English*, and (C) examples from the *½*.

Note: The following abbreviations were used throughout the passages:

N=Noun	PN=Proper Noun	V=Verb
Adj=Adjective	Adv=Adverb	ProN=Pronoun
Det=Determiner	Conj=Conjunction	Rel=Relative Pronoun
DM=Discourse Marker[8]	Tag=Tag Marker	Neg=Negation
Poss=Possessive Adj.	Dem=Demonstrative Adj.	Int=Interjection
Id=Idiomatic Expression		

The grammatical categories are marked above the underlined words and the translation into English of non-English words is given in square brackets below the line. The grammatical label for discourse markers will be included in brackets, for example, 'because' DM (Conj).

Set One: Code-switching examples within turns per group per time period

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[7] My interest was not to establish a baseline for a matrix language (as per Myers-Scotton), since I do not believe this can be established in any one study of bilingual discourse. The initial switch was simply the first switch from the language used at the beginning of the speaker's turn to the other language used and the swithc back was just the return to the initial language used at the start of the turn.

[8] I have labeled the following items as discourse markers (based on Schiffrin, 1987): **oh, well, and, but, or, so, because, now, then, I mean, y'know**

(A) The following examples show code-switching *within turns* for the *Furlan* group for all three time periods. Overall, when memories were recounted, the participants in this group used more Furlan than English throughout their conversations (see Figures 4.6, 4.7, and 4.8 for totals).

For the Time Period *Italy*

                                     Poss / N   N   / DM (Conj)

1. Fur-A-I: *che zoiavi a la bala con la <u>me</u>* / **friend** all the **time** / *<u>e</u> la nonna che ni*
                [*that I played ball with my*]   [*and grandma who was*
                guardava
                watching us]

For the Time Period *Time*

                     Dem /   N   / Rel

2. Fur-B-G: *...con <u>quel</u>* /**group** / *<u>che</u> lavoravi io vevi di ciacara l'ingleis...*
                [*with that*]   [*that I worked with I had to talk English...*]

For the Time Period *Canada*

                V/   N   / ProN / DM (Id)   N   / N

3. Fur-C-Ge: *<u>erin</u>* / **buddies** / *<u>io</u> e <u>lui</u>* / **you know** partners / *<u>pari</u> e fil i zevin sempre a la*
                [*we were*]   [*me and him*]   [*father and son we would always go*
                čhasa...
                hunting...]

The *Furlan* group had single-word and multiple-word switches, which occurred between various grammatical categories: adjective (Poss/Dem)-noun, noun-conjunction, verb-noun, noun-pronoun and so on. Code-switching was found within a phrase (NP-*<u>quel</u>* /**group**), between phrases (VP/NP- *<u>erin</u>* /**buddies**), or to elaborate a phrase (NP/NP-**partners** / *<u>pari</u> e fil*). Most participants in this group immigrated to Canada as young adults (average age 22.8 years).

(B) The following examples show code-switching *within turns* for the *English* group for all three time periods. Overall, the participants in this group used more English than Furlan throughout their conversations (see Figures 4.6, 4.7, & 4.8 for totals).

For the Time Period *Italy*

4. Eng-A-N: **some...now I can't remember what happened..but one of the planes had**

                              N / Det N   N / Prep
            dropped..had dropped <u>fuel.</u>./ <u>*un bidon di benzine*</u> / in our yard..
                              [*a barrel of gasoline*...]

For the Time Period *Time*

                      Prep/   N   / V
5. Eng-B-L: **oh yeah the bag <u>of</u> / <u>*baccala*</u> / <u>was</u> right next to the bag of walnuts**
                              [salt cod]

For the Time Period *Canada*

                          N   / N
6. Eng-C-L: **...and then the next <u>night</u> / <u>*polenta con lacais*</u>...**
                              [*polenta with snails*...]

                        V /   Det N   / DM (Conj)
7. Eng-C-L: **yeah...I <u>remember</u> /<u>*la befane*</u> /<u>and</u> putting our shoe or ...**
                              [*La Befana*]⁹

              DM (Adv)/ N   / Det N
8. Eng-C-L: **<u>yeah</u>/ <u>*caramelis*</u> / <u>the tangerine</u>...but I mean that was really something...**
                              [*candies*]

9. Eng-C-O: **I don't know if we stopped at one of the booths and so on so I rolled the**
                              Prep/ PN   / ProN V   Det/ PN   / DM
            window down and we were <u>near</u> / <u>*Udine*</u> / <u>we're</u> in <u>the</u> / <u>*Friuli*</u> / <u>so</u> I said to

---

⁹ In Italian folklore, La Befana is an old woman who brings gifts to children throughout Italy on the eve of the Epiphany.

N / V

the guy / *faveli Furlan***...**

[*do you speak Friulian*]

DM (Int) / V   N

10. Eng-C-O: **so I told him where we're trying to go...oohh ok /***seis iust va via par la*

[*you are right go that way*]

/DM (Conj)   Prep/ PN / N V

.../but...because even in /*Codroip***/ there's lots of Italian and you really**

Det / PN / Adv

got to strain your ear you know...for the /*Furlan***/anymore**

[Friulian]

The *English* group had single-word and multiple-word switches (phrases and clauses), which occurred between most grammatical categories: determiner-noun, preposition-proper noun, noun-verb, noun-preposition, discourse marker-verb and so on. This group generally inserted Furlan nouns and proper nouns for names of towns or cities and food items they remember from Italy (i.e. *Udine, Codroip, and caramelis).* Most of the participants in this group immigrated to Canada as young children (average age 8.5 years) and spoke mostly English during their childhood.

(C) The following examples show code-switching *within turns* for the ½- group for all three time periods. In this group the language used to discuss their memories varied. All the participants used Furlan for their memories of Italy, all the participants used English for their memories of Time, and some participants used Furlan while others used English for their memories of Canada (see Figures 4.6, 4.7, & 4.8 for totals).

For the Time Period *Italy*

N   / DM (Conj)

11. ½-B-E: *prima di scuele...pompa l'aga per li* **vačhis..**/.**and aahm...**

[*before school...pump water for the cows...*]

DM (Adv) / V

what else.../ *scova la* **čhase...la cio l'age per** *portar in čhase*

[*sweep the house...go get the water to bring in the house*]

For the Time Period *Time*

Adv/DM (V)/ProN V   V   / Prep

12. ½-D-M: *io soi stat a scuele chi* / **see** / *yo scominciat alora ho scominciat* /**in**

[*I had gone to school here*]   [*I started then I started*]

Adj /Adv   V / Prep   PN / ProN

grade **one** / *chi..sin venus* /**in** June and in **September** /*ho scominciat la*

[*here...we came*]   [*I started school

scuela allora io non saveva nuia nuia nuia di **...**

then I did not know anything anything anything of...]

13. ½-B-E: **what I was thinking...well..not not much really..the only thing it was**

DM (ADV)/ ProN

another language..when aah... /*chei che lavoravin li tal aeroport*

[*those who were working there at the airport

Adj /DM (Conj)/Adv   Adj /DM (Conj)

ha favelavin ingles /**...aand.../** *invesi de.. eri abituade di tedesc* /**so** it was

*were talking English***]   [***instead of...I was used to German...*]

DM (conj) / Prep

altogether a different language..and..ah../*fin a li non mi ha somiat*

[*up to there it didn't seem

Adj / Det   V   / Rel

*mal**..**/**the** only thing I **thought** /*che al'era ...no l'era nuia*

bad...]   [*that there was...there was nothing

Prep /   PN   / DM (Ad

e dopo di li invesi doi dis a veni su fin /**Hamilton***..*/*alore..*

and after there instead two days to get to]   [*then

N / DM (Conj)   DM (Id)

era il meis di mars e vedeva neif/**...and...no houses...no nothing...you know...**

it was the month of March and I saw snow]

/ Rel

/*che erin uzas in Italia che tu as čiazis di ca e di la**...**

[*that they were used to in Italy that you had houses here and there

For the Time Period *Canada*

N   /   DM (Id)   / ProN V

14. ½-A-S: *no ma tantes voltes* / **you know...** / *hai lavorat cuarant'ains sempre*

[*no but lots of times*]   [*I worked forty years always

<p style="text-align:center">V / N</p>

*eeh il nostro lavoro e di zinoglasi e e <u>metti</u> / <u>**tiles**</u> **you know**
aah our work is to kneel down and and put]

<p style="text-align:center">V   / Adv</p>

15. ½-D-M: **the funny thing <u>is</u> ...**/*<u>cuand che me favela in Furlan no e si dis...</u>*
     [*when he speaks to me in Friulian, no, and if I say*

<p style="text-align:center">Tag / ProN   N   / DM (Adv)</p>

se no sint o no hai capit..<u>no</u>... /   **<u>I</u> say..<u>pardon</u> /** *<u>alor lui la ripet dut par</u>*
[*if I don't hear or I don't understand, no*]   [*so then he repeats it in*

<p style="text-align:center">Adj /ProN   V / Adj / DM (Id)</p>

<u>ingles</u> /   **I say...I <u>understand</u>/** *<u>Furlan</u> /* **<u>you</u> know**
English...]   [*Friulian*]

Again, we see similar code-switching examples from the ½-group as we did for the other two groups. There are single-word and multiple-word switches (phrases and clauses) that occurred between most grammatical categories: preposition-proper noun, noun-conjunction, adverb-discourse marker, verb-adjective, verb-preposition and so on. Most participants in this group immigrated to Canada as young adults (average age 17.4 yrs).

Based on the above samples for code-switching (A, B, & C) within the turns of the speakers for all groups for all time periods, the following observations were made (see Figure 4.9 for totals):

- There were 35 different grammatical category combinations where code-switching took place, 24 for switch 1 (SW 1) and 19 for switch 2 (SW 2).
- The greatest number of switches involved nouns (including proper nouns) with a total of 36 (18 for SW 1 and 18 for SW 2).
    - For SW 1, most switch points (11/18) came before the noun (__N), i.e. #1... *con la <u>me</u>* / **<u>friend</u> [N]**, and for SW 2, most switch points (15/18) came after the noun (N__), i.e. #15... **<u>I</u> say..<u>pardon</u> [N]** / *<u>alor</u>*
- The second most frequent switch point involved discourse markers with a total of 23 (12 for SW 1 and 11 for SW 2).

o Half, or 7/14 followed nouns (__DM), i.e. #11 *l'aga per li vačhis*
[N]**../.and**

o Some, 3/14 followed adjecdtives (___DM), i.e. #13 *eri abituade di tedesc*
[Adj] /so it was

- Of the 20 discourse markers in the samples, 17 were spoken in English, of which
5 included the conjunction '**and**' and 4 included the idiomatic expression '**you
know'**.

- Some switches took place between determiners or possessives and nouns, i.e. #2
con quel [Dem] **/group** [N]

- With pronouns, 8/9 switch points came before the pronoun (__ProN), i.e. #3
buddies / *io e lui* [ProN] with most of the 8 occurring as a SW 2.

Grammatical Categories Where Switches Occur Per Switch Type For *Within Turns*

	N__	__N	V__	__V	Adv__	__Adv	Adj__	__Adj	Prep__	__Prep	ProN__	__ProN	DM__	__DM
■ Switch 1	7	11	8	2	1	2	0	1	3	3	1	1	6	6
▣ Switch 2	15	3	0	2	0	2	6	0	1	1	0	7	3	8
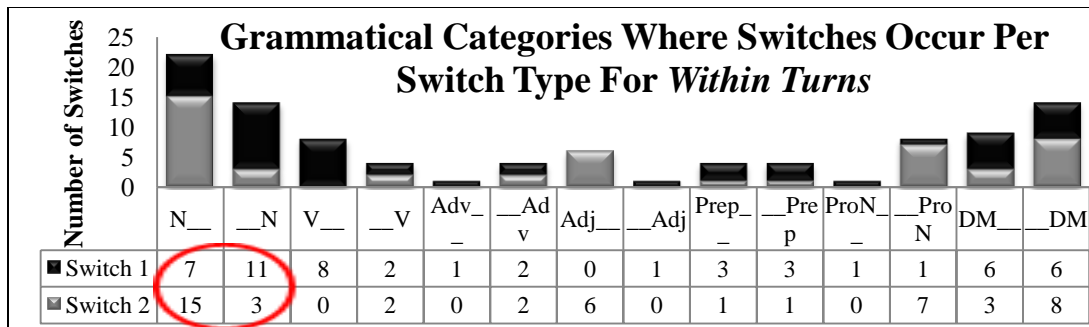
Figure 4.9. *Note*: for a complete inventory of switch type totals see Appendix D.

Next, we will look at examples of code-switching that occurs *between turns* in natural discourse. As with the first set of examples, they will be presented in the following order; (A) examples from *Furlan* group (B) examples from *English* group, and (C) examples from the ½-group.

Set Two: code-switching examples *Between Turns* Per Group Per Time Period

(A) The following examples show code-switching *between turns* for the *Furlan* group for all three time periods.

For the Time Period *Italy*

                                                                N
16. Fur-A-I: *han fat solo la quinta ma erin* <u>*sertoris*</u>
                [*they went only to the fifth (grade) but they were tailors*]
                / DM (Adv)
17. Fur-A- S: **/ <u>oh ya ya</u>**
                DM (Conj)
18. Fur-A-I: **/ <u>ma</u>**
              [*but*]
                DM (Conj)
19. Fur-A-S: **/ <u>so</u> if you have your talent it works**

                DM (Int) /DM (Conj)
20. Fur-A-I: <u>**ahh**</u>/ <u>*se tu ti sas a fa un roba   no ti serv doppo*</u>
                  [*if you know how to do something then it (school) does not matter*]

For the Time Period *Time*

                                Adj
21. Fur-C-Ge: *i montanis cha son i pi* <u>*bielis*</u>
                [*the mountains that are the most beautiful*]
                 /DM (Int) Neg
22. Fur-C-Gi: **/<u>aaahh</u>   <u>no</u>**

                /Det/   PN   / V   Adj
23. Fur-C-Ge: **/<u>*i*</u> /<u>Rocky Mountains</u> /** *son fantastis*
                [*the*]   [*are fantastic*]

For the Time Period *Time* **(different pair of speakers)**
                                                                V
24. Fur-A-S: *ma ancia tu ti has scominciat conosi talianis zint a* <u>*lavora*</u>
                 [*but also you had started to meet Italians through work*]
              / DM (Adv)/ DM (Conj)
25. Fur-A-I: **/ <u>yeah</u>**   / *ma cheis no ti zevis nencia pi di tant a trova ..ti zevis za*
                     [*but you didn't go often to visit them...you already had*
                                                                Adv
                l'amicizia prima di di lavora...cheis di lavora forse <u>*nencia*</u>*...*
                friendships from before work...those from work perhaps never...]

/DM (Adv) / Adj Adj
26. Fur-A-S: **/oh yeah**   / *vera vera*
                            [*true, true*]

/DM Adv) / Det N
27. Fur-A-I: **/yeah**   /*l'amicizia che che ti conosievis prima*
                        [*friendship that that you were familiar with first*]

                                    Det/ N /Tag
28. Fur-A-S: *e dopo si ha scominciat il* **/club** **/no**
                        [*and then we started the*]
                                    Det/ N
29. Fur-A-I: *e dopo la scominciat il* **/club**
                        [*and then started the*]

            /ProN   ProN
30. Fur-A-S: / *quel el e stat important per nuantris*
                        [*that was important for us*]
              /DM (Adv)   /Det/ N / Det
31. Fur-A-I: **/yeah..oh yeah...**/*il*   **/club**/ *el e stat bon*
                                [*the*]   [*it was good*]

For the Time Period *Canada*

                            Prep Det/ N
32. Fur-A-I: *io sei zuda una volta la tal* / **picnic**
                        [*I went one time there to the*]

                        DM (Adv)
33. Fur-A-S: **oh yeah yeah**
                /DM (Conj)
34. Fur-A-I: /*e no mi feva nencia tant caso...o la quel e ha ditte...*
                        [*and I didn't pay much attention to him or to what he said...*
                    quel e Gianni Lombardi...e doppo ho sentut talla radio
                    who Johnny Lombardy is...and after I heard him on the radio
                                        Adj
                e soi zut a saludalo... e *coma*...
                and I went and met him...he was like...]

82

          /DM (Int) / ProN

35. Fur-A-S: **/well** / *sin zus una volta io e***...**
          [*we went one time me and...*]
                                 PN

36. Fur-A-I: *mi plazeva tant Gianni Lombardi*
          [*I really liked Johnny Lombardy*]
          /DM (Adv)/ ProN   PN / Prep   PN

37. Fur-A-S: **/yeah..** / *sin zut una volta io e Pio* / **at** aahm **Wonderland**
          [*we went one time me and Pio*]
          / V   Det / N   / Rel V / PN /Conj/ PN
          ..../*era alla* / **weekend** / *che feniva* /**August** / *e* / **September..**
          [*...it was at the*]   [*that ended*]   [*and*]

          /DM (Adv)

38. Fur-A-I: **/***ah sì sì*
          [*yes yes*]
          Adj / N   / Det / Adj   N   / V   Det/ Adj   N / Prep

39. Fur-A-S: *che*/ **weekend** /*il il* /**long weekend** /*ha fevin sempre* **l'** /**Italian day** /*come***..**
          [*that*]   [*the the*]   [*they always did the*]   [*like...*]
          Adj /   N   / Adv   Det
          che /**weekend** /*li alora se ti vevis la la*
          [*that*]   [*there so if you had the the*]
          / DM (Adv)   PN / DM (Conj)

40. Fur-A-I: **/yeah yeah..CHIN yeah CHIN CHIN** / *e ti lo fevi paia manco*
                                          [*and it allowed you pay less*]

41. Fur-A-S: *si ti vevis la la bandiera***...**
          [*if you had the the flag...*]

    The *Furlan* group had mostly single-word switches, which occurred between several grammatical categories: noun-discourse marker, conjunction-conjunction, verb-discourse marker, adjective-discourse marker, noun-noun and so on. The code-switching between turns most often included discourse markers or a repetition of the same word in the other language. The English discourse markers used at the switch point did not cause the discussion to continue in English.

(B) The following examples show code-switching *between turns* for the *English* group
for all three time periods.

For the Time Period *Italy*

                                               N
42. Eng-A-N: **yeah and aah of course the the <u>chestnuts</u>**

                   / N
43. Eng-A-D: **/ *chestins***
               [chestnuts]
                 /DM (Conj)/   N   / DM (Adv)
44. Eng-A-N: **/ aa-and**   **/ *mandorla* /yeah .. is a big thing..aah**
                             [almond]

For the Time Period *Time*

45. Eng-A-N: **so we didn't learn English there because we picked fruit with the**
                              N
           Polish <u>ladies</u>...
             /Det N
46. Eng-A-D**:** **/ *i polakis***
              [the Polish]
           / ProN
47. Eng-A-N: **/<u>that</u>'s that...aahm we went to the house farm**

For the Time Period *Canada*

There were no examples of code-switching for this time period for this group for they
spoke all in English.

    For the English group, the switches that occurred were mostly just single-words (i.e.
chestins). There was one noun phrase (i.e. *i polakis*) used**.** The purpose of these switches
seemed to be for repetition; an English word would be repeated in its original language,
for example. In general, this group used very little Furlan, which may be due to their age
at time of immigration (see Appendix A for the participants' demographics). Most of
them came to Canada when they were very young (4-8 years).

(C) The following examples show code-switching *between turns* for the *½*-group for all
three time periods.

For the Time Period *Italy*

                                                    Adv
48. ½-B-R: **I used to go out**

                              / Adv   N
49. ½-B-E: **/*tramite un couzin***
                    [along with a cousin]

                            /Prep   N / V
50. ½-B-R: **/with this cousin/** *lavin fou fazevin i amis...eeh..una roba..*
                    [we would go out and make friends and..one thing..
                                              N   / Det
              ha clamat che altris **/the usual things...**
                    he called the others]

51. ½-B-E: **then I-I went to Switzerland and he came over here...**

For the Time Period *Italy* (different speakers)

                          DM (Conj)
52. ½-A- S: *eeh eeh e cuant che tiavin el-el forment doppo che lu portavin via*
                    [and when we cut the-the wheat after that they brought it away
                                                  N / DM (Id)   Adv/   V
              erin simpre sp- le spirs **/you know** eeh **as** /*ciapavin su tal sac–*
              [there was always sp- the stalks]   *[we would pick them up in a sack-*

                                              N   /   DM (Id)
              e li davevin mangia i colomps / **you know** eeh
              [and we would feed them to the pigeons]
53. ½-A- A: **we used to yeah we used to yeah pick up what the farmers had left you**
              know the odd...
54. ½-A-S: **oh yeah yeah**
                                        Tag / Det N
55. ½-A-A: **the odd the odd eh /*le spirs***
                                        [the stalks]

                     N   / DM (Adv)
56. ½-A-S: *le spirs* / **yeah**
                  [*the stalks*]

                                                                                 Prep
57. ½-A-A: **the odd piece of wheat like you know here and there we pick 'em up**
                  /DM (Adv)   Prep
58. ½-A-S: /*alor   i ciapavin su*
                  [*then we would pick them up*]

                  /Conj   ProN
59. ½-A-A: / **if there too small or something**

                  /DM (Conj)   PN / ProN V / PN   Det N
60. ½-A-S: / *e lein tal bosc a Suzans* / **it was** / *Suzans ha l'era un pizut   un puc...*
                  [*and wood in the forest in Suzans*]   [*Suzans ws a small town a bit...*
                  /Prep   DM (Adv)
61. ½-A-A: /**up on up on the hill yeah**
                  /DM (Conj)
62. ½-A-S: /*e l'era su la montanie e durant la guera an tiat dut i i i čha-čhastinars*
         [*and there was on the mountain, during the war, they cut all the the ch-chestnut trees*
                                                  Det/   N   /DM (Conj)
                  per far fûc...eeh...avevin...e alor lasat i / **stumps** / *e li –les ciovers*
                  [*to make the fire...and...they had...and so left the*]   [*and the branches*]

63. ½-A-S: *eeh eeh eeh ance portavi ance Sandro eeh l'evin su*
                  [*and, and, and also we would bring also Sandro..eh..we would go*
                              N   /   V
                  cul le pale e picon / **ding** ding ding
                  with shovels and pickaxe]
                              V
64. ½-A-A: **that was**
                  / V   N
65. ½-A-S: / *tirarlo fou portala a čhase*
                  [*to take it out and bring it home*]
                  / V
66 ½-A-A: / **take** you two two hours to take one of those out you know

For the Time Period *Time*

Adv
67. ½-C-M: */e dopo quando..*
          [*and after when..*]
          /DM (Conj)   V Neg
68. ½-C-A: **/ but I didn't go to school for an English..he went a while...I didn't**
          /ProN V
69. ½-C-M: */io sono*
          [*I am*]
           ProN   ProN
70. ½-C-A: **/I don't know how to write it**
            /V
71. ½-C-M: */sono andata a scuola di inglese tre anni...tre anni...tre mesi...*
          I had gone to school for English three years..three years..three months...]

For the Time Period *Canada*

N
72. ½-D-A: *eeh avanti e dopo a vin vut in setante seis il prin frut*
          [*ehh ok and then we had, in seventy six, our first son*]
           /Prep   Tag
73. ½-D-M: **/up the street right**
            /DM (Conj)
74. ½-D-A: **/** *e-e-e dopo dal setante siet un antra..la Julie.. e dopo otante doi*
          [*and then in seventy seven another...Julie...and then eighty two*]
                                              DM (Adv)
          Robert..tre frus..si, dos frus e una frutta...e avanti così
              [*..three kids..yes, two boys and one girl...and so on*]
            /ProN
75. ½-D-M: **/he said everything**

    For the ½ group, the switches were mostly phrases and clauses (i.e. #65 *tirarlo fou*

portala a čhase), which occurred between several different grammatical categories:

adverb-preposition, noun, preposition, discourse marker-preposition, noun-verb and so

on.

Based on the above samples for code-switching 'between' the turns of the speakers for all groups for all time periods, the following observations were made (see Figure 4.10):

- There were 23 different grammatical categories where code-switching took place, 16 for SW 1 and 12 for SW 2.
- The most frequent switch point involved discourse markers with a total of 24 (13 for SW 1 and 11 for SW 2).
- The discourse marker mostly followed adjectives and/ or conjunctions or other discourse markers, i.e. #67-68 *e dopo quando..*/ **but** [DM] **I didn't go**
- The second most frequent switch point involved nouns (including proper nouns) with a total of 13 (8 for SW 1 and 5 for SW 2).
  - Most switch points occurred after the noun (N__), i.e. #49-50 *tramite un couzin* [N] / **with** this **cousin**
- Of the 24 discourse markers in the samples, most were spoken in English and the most frequently used one was the adverb '**yeah**' or '**oh ya**'.
  - Most switch points occurred before the discourse marker (__DM), i.e. #67-#68 *e dopo quando... /***but** [DM] **I didn't go**

	N__	__N	V__	__V	Adv__	__Adv	Adj__	__Adj	Prep__	__Prep	ProN__	__ProN	DM__	__DM
Switch 1	7	2	2	1	3	1	3	0	1	2	1	2	2	11
Switch 2	5	0	1	2	0	0	0	0	1	1	2	3	3	8
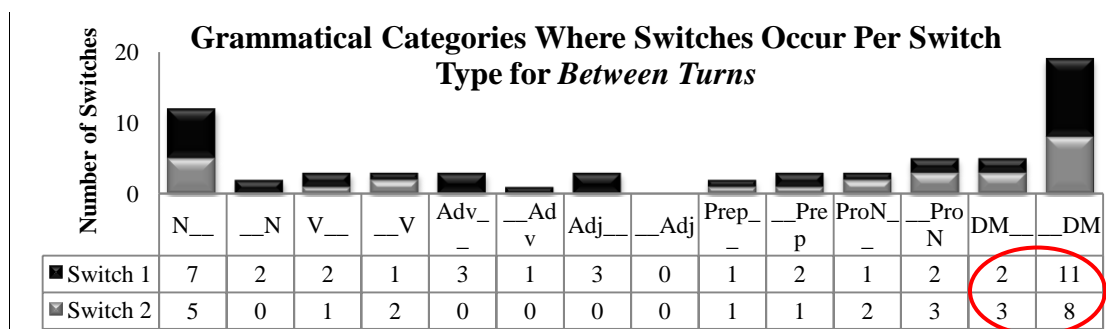
Figure 4. 10   *Note*: for a complete inventory of switch type totals see Appendix D.

Regarding the data from the above samples of code-switching *within turns* and *between turns*, many similarities, but some differences were discovered:

- Nouns and discourse markers were most frequently switched in both categories.

- o The most frequent switch point for both took place between N/DM (i.e. #11 *li vačhis*../.**and aahm,** #16-17 *sertoris…*/ **oh yeah yeah**, and #56 *le spirs* / **yeah**).
- Code-switching occurred between many grammatical categories for both within and between turns, for example:
  - o N/Det, N/N, N/V, N/ProN, N/Prep, N/DM, PN/DM, Adj/DM, Adv/DM, ProN/DM, DM/ProN.
- Differences were also found. Some grammatical categories were switch points only for *within turns*:
  - o Examples: N/Rel, PN/Adv, V/Rel, Det/PN, Adj/Det, Prep/N, DM/N, Tag/ProN, Poss/N (for all grammatical categories per switch types see Appendix E).
- Conversely, others were only switch points for *between turns*:
  - o Examples: V/ProN, V/V, Det/DM, Adv/Adv, Prep/Conj, DM/DM (for all grammatical categories per switch types see Appendix E).

Further sampling is necessary in order to verify these types of similarities and differences. The code-switching data base LIPPS may be of great value for such investigation.

Why are these findings important? Although the total number of switches and the total number of grammatical categories found at switch points were lower in the *between turns* category, the ratio between Switch 1 and Switch 2 were proportionately comparable for each group. There were more initial switches than switch backs for each (see Figure 4.11, 4.12). The initial switch point, or SW 1, was determined as the point where one language switched to the other regardless of which language was spoken at the onset of the turn or turn sequence, L1 or L2. This similarly proportioned number of switches to switch types indicates that perhaps code-switching is not affected by extraneous factors, such as the interlocutor or topic of conversation, but rather that code-switching is a patterned or innate behaviour that operates within the individual. Perhaps code-switching can be analogous to idiolects in the sense that everyone has a unique imprint, a unique way of

speaking that drives the way we think and process language. And perhaps this type of code-switching, conversational code-switching, is more 'subconscious' and 'conscious'. As many of my participants said during the interview, they did not even realize they switched languages while talking. To investigate this further we will look at code-switching frequency results for *within* and *between turns* based on the entire study.

Total Number of Switches Per Switch-Type for *Within* and *Between Turns*

40
30
20
10
0

30
26
20
15

Switch 1   Switch 2 | Switch 1   Switch 2
Within Turns | Between Turns
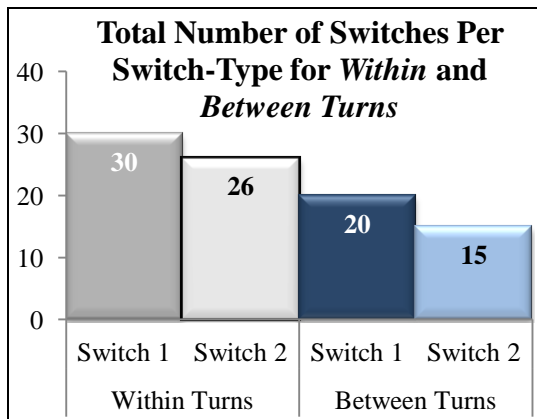
Figure 4.11 Note: See Appendix D for totals

Total Number of Grammatical Categories Where Switching Took Place Per Switch-Type for *Within* and *Between Turns*

40
20
0

23
19
16
12

Switch 1   Switch 2 | Switch 1   Switch 2
Within Turns | Between Turns
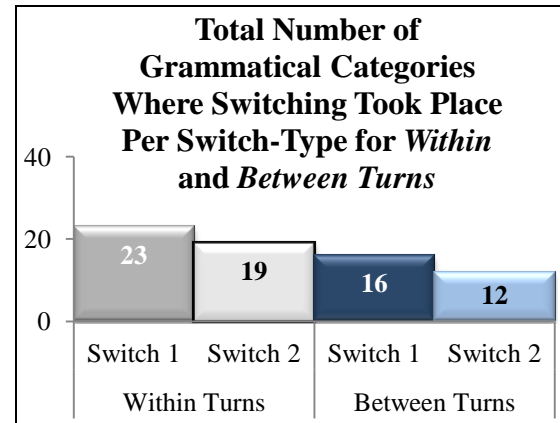
Figure 4.12 Note: See Appendix D for totals

In this next part, we will look at code-switching similarities and differences between the categories *within* and *between turns* found in all the data. Because I was looking at code-switching between speakers as well as within speakers, I added the individual scores for *within turns* for each of the speakers per conversation so that equal comparisons could be made. First I wanted to see how the totals for the sample compared to the totals for the entire study. As shown in Figures 4.13 and 4.14 the ratios are slightly different; however, we still see that the majority of the switches took place *within* the turns of the speakers.

Total Number of Code-Switches for *Within* and *Between Turns* (All Data)

Between Turns 26%
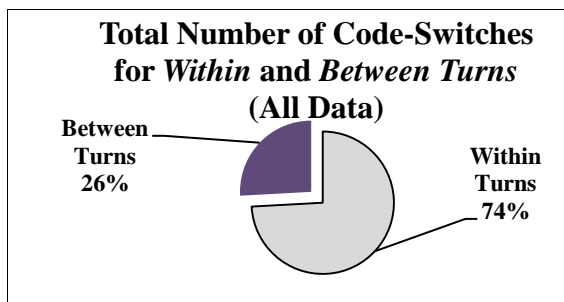
Within Turns 74%

Figure 4.13 Note: See Appendix F for totals

Total Number of Code-Switches for *Within* and *Between Turns* (Sample)

Between Turns 38%
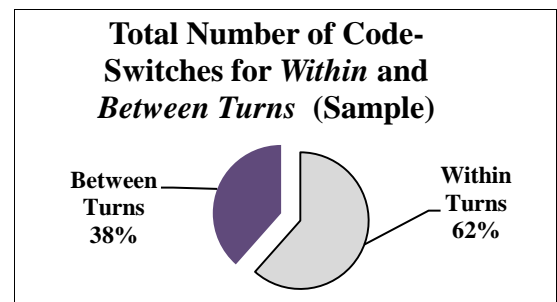
Within Turns 62%

Figure 4.14 Note: See Appendix D for totals

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The following graph, Figure 4.15 shows the total numbers of switches that were found per conversation for *within* and *between turns*. First, we see that there are more code-switches for *within* turns than *between turns* (as we saw in the sample totals as well). This was to be expected. Interestingly, a similar pattern became visible when the totals for each conversation for each category were plotted. The two categories (*within* and *between turns*) seemed to differ proportionately (for the most part) for each conversation.

Total Number of Code-Switches *Within* and *Between Turns* Per Conversation									
	Fur-A	Fur-B	Fur-C	Eng-A	Eng-B	Eng-C	1/2-A	1/2-B	1/2-C	1/2-D
CS Within Turns	450	110	160	139	32	131	218	357	368	154
CS Between Turns	232	32	60	20	4	12	97	44	183	55
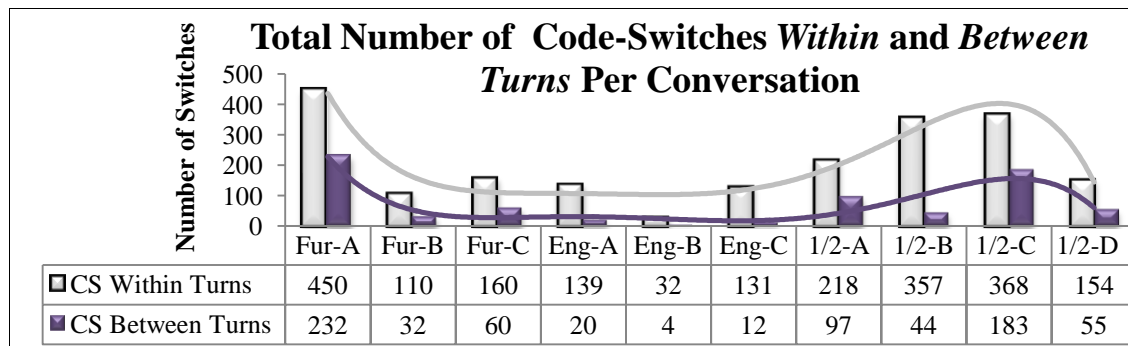
Figure 4.15   *Note*: the number of code-switches per conversation is the sum of the total number of switches per person per interview for each category. The totals for *within turns* do not include switches that took place *between turns*. CS=Code-switching

A similar pattern was found when the averages for *within* and *between turns* were plotted for each group (see Figure 4.16). Again, although the numbers of switches were fewer for *between turns* than *within turns* for each pair in the conversations (the greatest difference was for the ½ group), we see that the proportions are comparable across the three groups. We may be tempted to conclude that bilinguals code-switch similarly within and between turns and that the difference is found only in frequency, not type. Again, further investigation is needed before such conclusions can be made.

Average Number of Code-Switches Per Group Per Code-Switching Category For All Three Time Periods		
	Furlan Average	English Average	1/2 Average
CS Within Turns	240	100.7	274.5
CS Between Turns	108	12.3	94.8
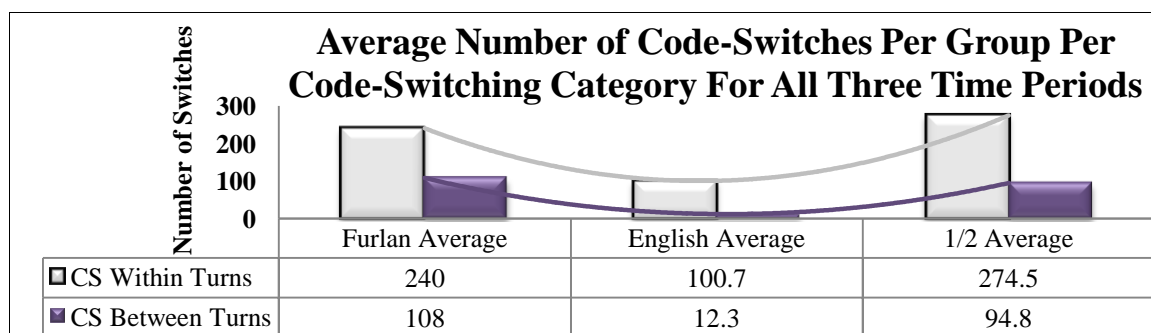
Figure 4.16 Note: CS=Code-switching

When the average percentage ratios were calculated for each group for *within* and *between turns* (see Figure 4.17), it was interesting to see how closely they matched the overall averages, which were 78.3% for *within turns* and 21.7% for *between turns*. The participants in the English group had the fewest switches for *between turns*, because their conversations were mostly in English, as they did not code-switch often. As for the other two groups, they seemed to compare similarly with the overall total ratio percentage.
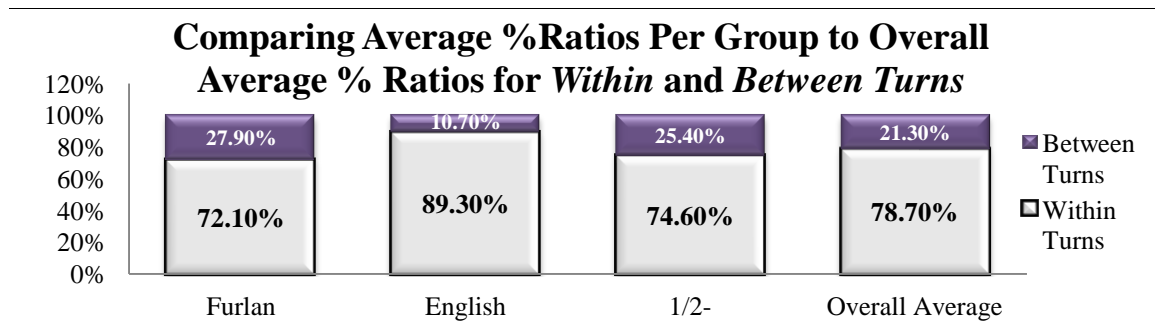
Figure 4.17 Note: See Appendix G for totals

The samples (#1-75) included in the first part of this section provided a small glimpse of naturally occurring code-switching among elderly Italian immigrants in conversation. From this several observations have been made:

- Code-switching takes place between many grammatical categories. Some are found in both *within* and *between turns*, while others are only found in one or the other (based on the analysis of the samples only).

- The most common grammatical categories where switches occurred for both categories in the samples provided involve nouns (common and proper) and discourse markers (i.e. **oh yeah, and, but**).

- More switches took place *within* the turns of the speaker. On average 78.3% for *within turns* and 21.7% for *between turns*.

- The percentage ratio for code-switching for *within* and *between turns* patterned similarly across all conversations. This was also observed in the percentage ratio averages for each group.

- The total number of SW 1 and SW 2 switches were proportionately similar between the *within* and *between turns* categories. Also, the total number of

grammatical categories where switches occurred, SW 1 and SW 2 were proportionately equal between the *within* and *between turns* categories.

The patterns of proportionality between the type of code-switching (*within* and *between turns* and for Switch 1 and Switch 2) found in the samples and the entire data is most interesting and it raises an important issue regarding the underlying motivational factors involved in code-switching. Some general observations were made based on the samples analyzed in the first part of this section. It was found that instances of code-switching occurred at word, clause, and phrase boundaries, switches were single words or entire phrases, and that the switching took place between many different grammatical categories (as seen in Appendix C). The data also showed that code-switching included both function and content words, for example #37 ***alla*** / **weekend** (function/content) and #12 ***scominciat*** / **in grade one** (content/function).

Considering that code-switching occurred extensively throughout the samples (and the rest of the data), it appears as though grammar does not restrict the location of the switch between Furlan and English. In addition, the total number of memories shared and the language used in recounting memories varied between individuals and between groups, therefore we cannot determine that code-switching is a result of mismatched languages (encoding and recall). Nor can we determine that code-switching is the result of one's degree of bilingualism or language use. Each participant's linguistic abilities and daily language use (of Furlan and English) is unique. So too are the memories shared and the linguistic traces that have imprinted those memories. Yet despite the differences between participants, their memories, level of bilingualism, and so on, one similarity that surfaced was the pattern of code-switching for *within* and *between turns* among all the participants; the % ratios between these two types of code-switching was comparable for all participants to the overall average (see Figure 4.17). As a result of these findings, further investigation was necessary in order to observe patterns of code-switching for each time period and will be discussed in the next objective.

4.4.3 Objective three: Code-Switching in Autobiographical Memories

The third objective was to analyze and compare instances of code-switching in bilingual autobiographical memories over the following periods: pre-immigration (memories from Italy), time of immigration (their voyage to Canada and the first year here), and post immigration (memories starting after their first year in Canada to the present day).

As mentioned, I expected to find more memories recounted for the time periods where the language of the memories matched the language of the questions, thus supporting language-specificity. The red stars (see Figure 4.18) represent the time period where I expected to see the most memories recounted. The black circles indicate the time period with the greatest percentage of total memories shared (see Figure 4.18). Expectations were partially met with the ½-group who shared the greatest number of memories when the language matched the time period *Canada*.

When there was a mismatch in languages, I expected to find more instances of code-switching (red stars in Figure 4.19). Based on the total number of switches per group (black circles in Figure 4.19), this was only evident in the *Furlan* group, who showed more instances of code-switching for the time period *Time* (slightly more than for *Canada*). This would be expected since memories encoded during that time would be in either Furlan or English.

From this general comparison between number of memories shared and number of code-switches in conversation (for *within turns*), we find that the predicted outcomes for language-specificity and code-switching (based on group totals) were partially met (as mentioned above). One interesting comparison to note involved the ½-group, whose % ratio of memories and % ratio of switches are similarly proportioned for each of the three time periods. Since these results were based on group totals only, further analysis was necessary to explore patterns within each group.
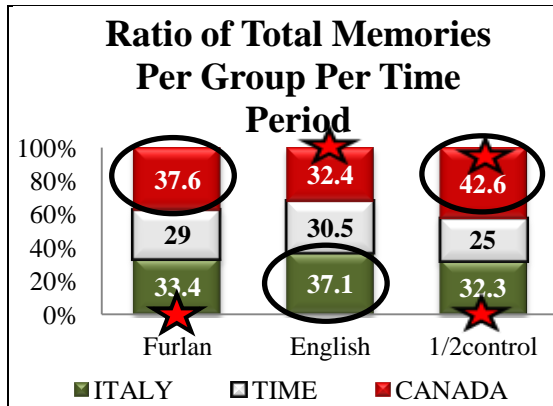
Figure 4.18 For totals see Appendix C
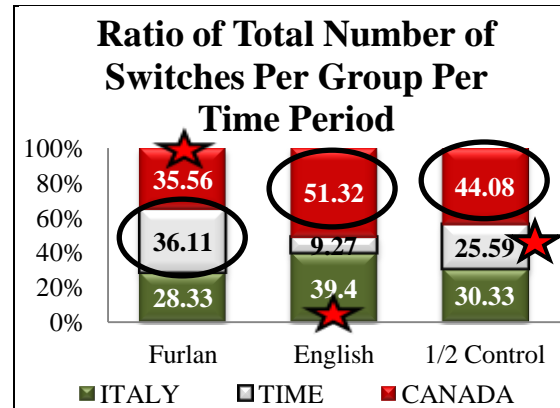
Figure 4.19 For totals see Appendix F

The next three graphs (see Figures 4.20, 4.21, & 4.22) represent the ratio of switches per person per time period. In the *Furlan* group (figure 4.20) where all questions were asked in Furlan, the results varied with regards to total number of code-switches when languages mismatched. Of the five participants in that group, two (40%) switched more when recounting early memories of *Italy*, two (40%) switched more for *Time*, and 1 (20%) switched more for *Canada*. For this group over half demonstrated code-switching for the time periods where there was a mismatch of languages.

Ratio of Code-Switching Per Person Per Time Period for the *Furlan* Group

	Fur-A-S	Fur-A-I	Fur-B-G	Fur-C-Ge	Fur-C-Gi
■ CS Canada	32.6	28.5	41.8	26.9	54.6
□ CS Time	28.8	33.2	50	65.4	28.7
■ CS Italy	38.6	38.3	8.2	7.7	16.7
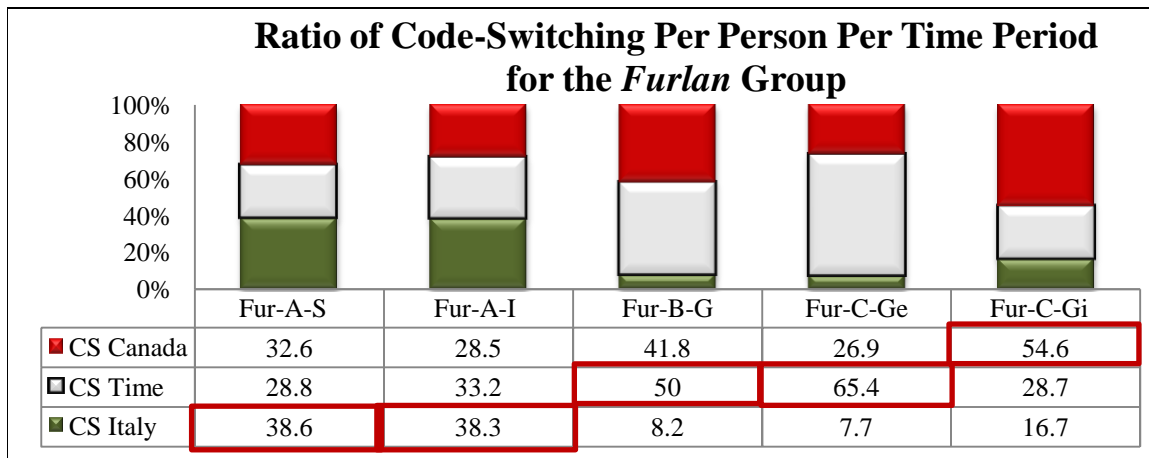
Figure 4.20 Note: See Table 4.3 for total percentage ratio of words and code-switching within turns per person. CS=Code-switching

In the *English* group (figure 4.21) where all questions of the interview were asked in English, the results also varied with regards to total number of code-switches when languages mismatched. Of the six participants in the group, three (50%) switched more

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when recounting early memories of *Italy*, one (16.7%) switched more for *Time*, and two (33.3%) switched more for *Canada*. For this group, half demonstrated code-switching where there was a mismatch of languages.

Ratio of Code-Switching Per Person Per Time Period for the *English* Group

	Eng-A-N	Eng-A-D	Eng-B-B	Eng-B-L	Eng-C-0	Eng-C-L
CS Canada	18.6	82.5	16	14.3	67.4	33.3
CS Time	8.5	13.75	8	85.7	4.7	0
CS Italy	72.9	3.75	76	0	27.9	66.7
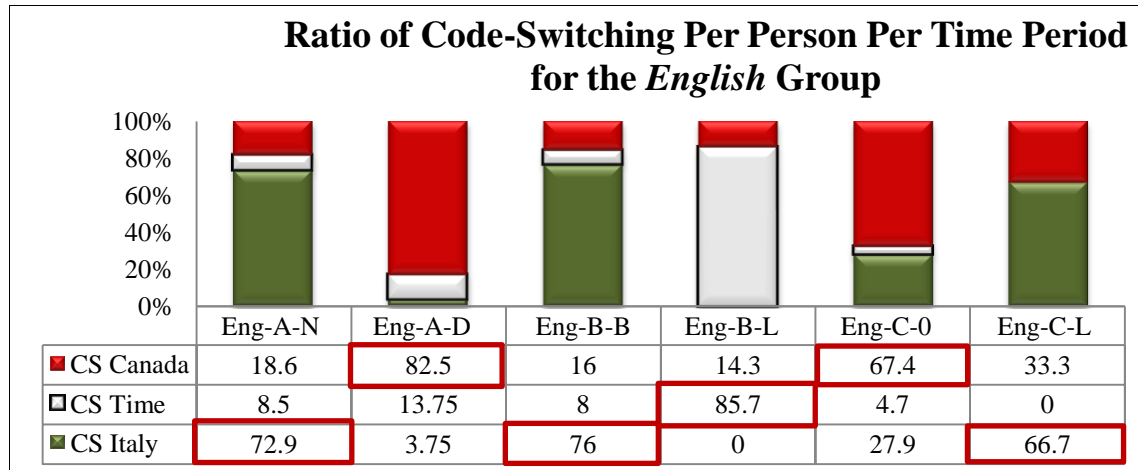
Figure 4.21 Note: See Table 4.3 for total percentage ratio of words and code-switching within turns per person. CS=Code-switching.

In the ½-group (see Figure 4.22) where the first half of the interview questions were asked in Furlan and the second half were asked in English, there was a two way division regarding the total number of code-switches. For this group I anticipated more switching to take place during the time period *Time* as this was the point where languages would mismatch the most. Instead, the majority of the switching was evident for *Italy* and *Canada*, where languages matched. Of the eight participants, three (37.5%) switched more in recalling early memories of *Italy* and five (62.5%) switched more for *Canada*. For this group, theoretically they do not support the literature (Marian & Kaushanskaya, 2005), which states that code-switching occurs when recounting memories when there is a mismatch in language of encoding and language of retrieval.

Ratio of Code-Switching Per Person Per Time Period for the *1/2* Group

	1/2-A-S	1/2-A-A	1/2-B-R	1/2-B-E	1/2-C-M	1/2-C-A	1/2-D-A	1/2-D-M
CS Canada	18.6	55.8	25.9	50.8	53	36.6	78	52.4
CS Time	21.7	2.3	35.9	35	21.3	21.1	18.7	47.6
CS Italy	59.7	41.9	38.2	14.2	25.7	42.3	3.3	0
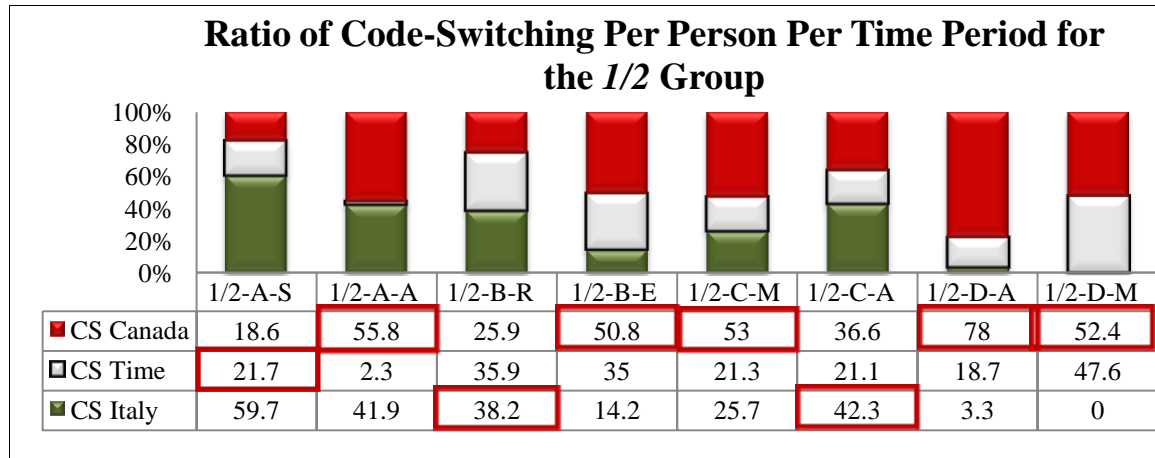
Figure 4.22 Note: See Table 4.3 for total percentage ratio of words and code-switching within turns per person. CS=Code-switching

From the results of the above three groups, six participants (31.6%) code-switched when languages mismatched, thus supporting the research by Marian & Kaushanskaya (2005), but what about the remaining 13 participants (68.4%) who did not demonstrate this? To investigate this further, I compared the percent ratios between each participant's word counts and number of code-switches to see if there was a correlation between them.

In Table 4.3 both sets of ratios are shown per person per time period. The boxes that are coloured in pink represent the highest number for all three time periods. The Figures that are coloured blue indicate the highest numbers that correspond to each set of ratios for each participant. For example, the first participant recounted more early memories of *Italy* (41.2%) and code-switched more for that time period as well (38.6%). Similar results were found in the second participant's totals. Overall, four (80%) participants in the *Furlan* group, four (66.7%) in the *English* group, and five (62.5%) in the *½* group showed this type of correlation. In total, 13 participants (68.4%) code-switched more in the time period where they shared more memories. Of these 13 participants whose highest totals correlated, only 3 participants (one in the *Furlan* group and two in the *English* group) code-switched the most when the languages mismatched (shown by the red circles in Table 4.3).

After comparing the two sets of ratios, it appeared as though there was a great correlation between the amount of code-switching and the amount of words spoken by the

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participant than to the mismatch of languages between encoded and recalled memories. Does this indicate that code-switching is not the result of language differences, but the reflection of individual thought? Do bilinguals just happen to switch more when they talk more? Are certain types of words code-switched more than others during conversation? This last objective looked briefly at the use of discourse markers in the data; two in particular were analyzed, '*sì*' and '*yeah*'.

Table 4.3 **Total Percentage Ratios of Words and Code-Switches (Within Turns) Per Person Per Time Period**

	Italy	*Time*	*Canada*		*Italy*	*Time*	*Canada*
	%Words	%Words	%Words		% CS	% CS	% CS
Fur-A-S	**41.2**	25.7	33.1	Fur-A-S	**38.6**	28.8	32.6
Fur-A-I	**42.9**	30.8	26.3	Fur-A-I	**38.3**	33.2	28.5
Fur-B-G	21.9	26.4	51.7	Fur-B-G	8.2	50	41.8
Fur-C-Ge	28.8	**45.3**	25.9	Fur-C-Ge	7.7	**65.4**	26.9
Fur-C-Gi	28.7	27.3	44	Fur-C-Gi	16.7	28.7	54.6
Eng-A-N	40.9	42.7	16.4	Eng-A-N	72.9	8.5	18.6
Eng-A-D	9.2	28	**62.8**	Eng-A-D	3.75	13.75	**82.5**
Eng-B-B	52	33.6	14.4	Eng-B-B	76	8	16
Eng-B-L	21.5	**42.8**	35.7	Eng-B-L	0	**85.7**	14.3
Eng-C-0	42.5	16.2	41.3	Eng-C-0	27.9	4.7	67.4
Eng-C-L	48.1	14.1	37.8	Eng-C-L	66.7	0	33.3
1/2-A-S	**44.2**	26.1	29.7	1/2-A-S	59.7	21.7	18.6
1/2-A-A	23.5	**38.3**	38.2	1/2-A-A	41.9	2.3	55.8
1/2-B-R	29.9	**35.5**	34.6	1/2-B-R	38.2	35.9	25.9
1/2-B-E	17.6	33.6	**48.8**	1/2-B-E	14.2	35	**50.8**
1/2-C-M	48.5	11.1	40.4	1/2-C-M	25.7	21.3	53
1/2-C-A	**46.4**	15.1	38.5	1/2-C-A	**42.3**	21.1	36.6
1/2-D-A	17.7	11.3	**71**	1/2-D-A	3.3	18.7	**78**
1/2-D-M	14.8	28.2	**57**	1/2-D-M	0	47.6	**52.4**

Note: the percentages are based on the total number of words per time period per person, divided by the total number of words per person per time period (See Appendix C). The code-switching percentages are based on totals for within turns (See Appendix F). CS=Code-switching

4.4.4 Objective four: The discourse markers '*sì*' and '*yeah*'

The fourth objective was to investigate (very briefly) the use of the discourse markers (DMs) '*sì*' and '*yeah*' in conversation relating to code-switching, language specificity and

AM. I wanted to know whether or not these DMs would be found at switch points, whether they would reflect language-specificity and how each DM would be used (in general) in conversation when recounting memories over the three time periods. I hypothesized that the DMs would be tied to the language of the memory or time period in which they would have been learned or first acquired; therefore, the DM '*yeah*'[10], for example, would be used more than '*sì*' when recounting memories of *Canada*, for that is when they would have learned it first.

Since DMs are frequently used in conversation, I decided to conduct a preliminary investigation of two particular ones to see if they supported language-specificity. The DMs '*sì*' and '*yeah*' were analyzed in terms of frequency, group distribution, and code-switching (*within* and *between* turns). In theory, the DM '*sì*' should be used more than '*yeah*' in recounting memories for the time period *Italy*, thus supporting language-specificity. The overall frequency of use per group will be presented, followed by their use in recalled memories over the three time periods, followed by their distribution both *within* and *between* speakers.

A broad overview of the DMs '*sì*' and '*yeah*' (see Figures 4.23 and 4.24) was first conducted in order to observe their overall distribution (all time periods included) per group. Based on frequency totals for each DM, '*sì*' was used more by the *Furlan* group (74%) than the other two groups, and '*yeah*' was used similarly between all three groups. From this we may suggest that without looking at each time period separately, language-specificity was reflected in the DM '*sì*' since it was used most frequently by the *Furlan* group where there was a language match. On the other hand, there was no clear suggestion of language-specificity with the DM '*yeah*' since its frequency was more evenly distributed between all three groups. Perhaps the DM '*yeah*' has replaced '*sì*' in general; it is easier to say and use in conversation. Because the *Furlan* group used '*sì*' more than the other groups (overall), a distributional analysis of the DMs for each time period was done to observe frequency of use per group.

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[10] This word would not have been used in Italy during the formative years of the participants in this study. I have assigned this to be an English word, learned after immigrating to Canada.

Frequency of DM 'sì' Per Group (overall)

Furlan 74%

English 1%

1/2- 25%
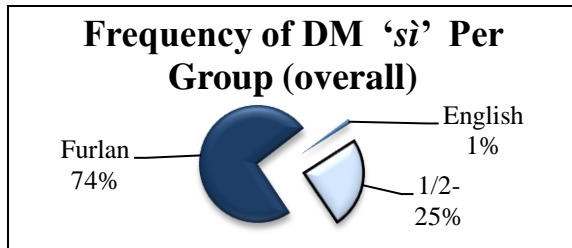
Figure 4.23 Note: See Appendix I for totals

Freqency or DM 'yeah' Per Group (overall)

Furlan 29%

English 39%

1-2- 32%
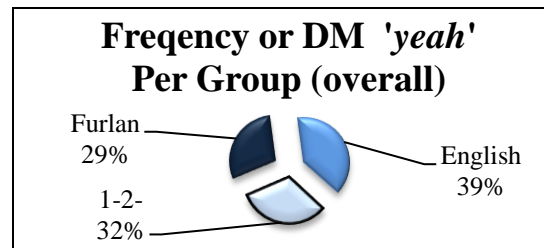
Figure 4.24 Note: See Appendix I for totals

When the distribution of DMs 'sì' and 'yeah' were parsed for each group, interesting results were discovered. Regarding the DM 'sì', the *Furlan* group used it more when recounting their memories from *Time* and *Canada* (See green circle in Figure 4.25) than their memories from *Italy* (See red star in Figure 4.25) and used the DM 'yeah' more when recounting their memories from *Italy* (See green circle in Figure 4.26) than from *Time* and *Canada* (See red stars in Figure 4.26), which in theory does not support language-specificity (language to memory). Language-specificity was supported for the DM 'yeah' by the *½*-group who used it more when recounting their memories from *Time* and *Canada* than from *Italy*.

The distribution and frequency of the DMs 'sì' and 'yeah' in Figures 4.25 and 4.26 demonstrate that based on group averages, language-specificity is both supported and not supported (mostly not supported). This may indicate that DMs are not necessarily language-specific as far as their connection to the memory trace (supporting encoding specificity); rather are influenced by the language mode of the participant. In other words, the choice of DM may depend more on the language used in conversation than to the language of the encoded memory. It was interesting to discover that overall, the DM 'sì' was used more when memories of *Canada* were recalled and the DM 'yeah' was used more when memories of *Italy* were recalled; contrary to my expectations.

Average Frequency of DM '*sì*' Per Group Per Time Period
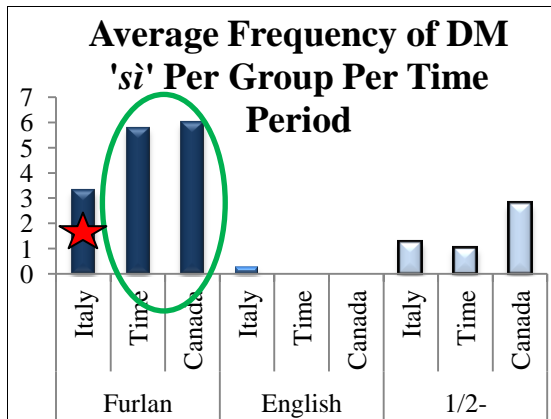
Figure 4.25 Note: See Appendix I for totals

Average Frequency of DM '*yeah*' Per Group Per Time Period
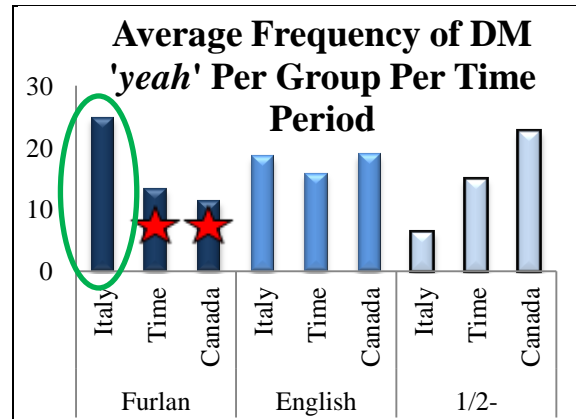
Figure 4.26 Note: See Appendix I for totals

When a distributional analysis was done on the DMs '*sì*' and '*yeah*' within the turns of the speakers (see Figures 4.27 and 4.28), it was found that both DMs were used more often at the start of a turn than any other location within the turn. This was the case for each group for each time period, except for the *½*-group, who used the DM '*sì*' more in the middle of the turn when recounting memories from *Italy* and *Time* than at the beginning of the turn. Since these DMs (in either language) were used more frequently at the start of the speakers' turns, we can see their significance in conversational discourse analysis. It was clear that these particular discourse markers were used frequently, perhaps even habitually, between the turns of speakers.

Average Distribution for the DM '*sì*' Per Group Per Time Period
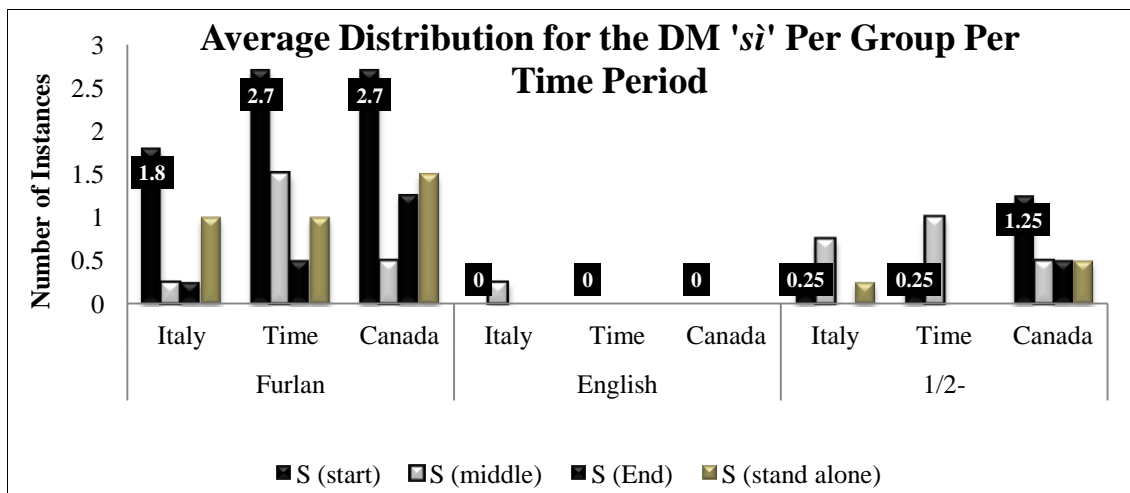
Figure 4.27 Note: See Appendix I for totals
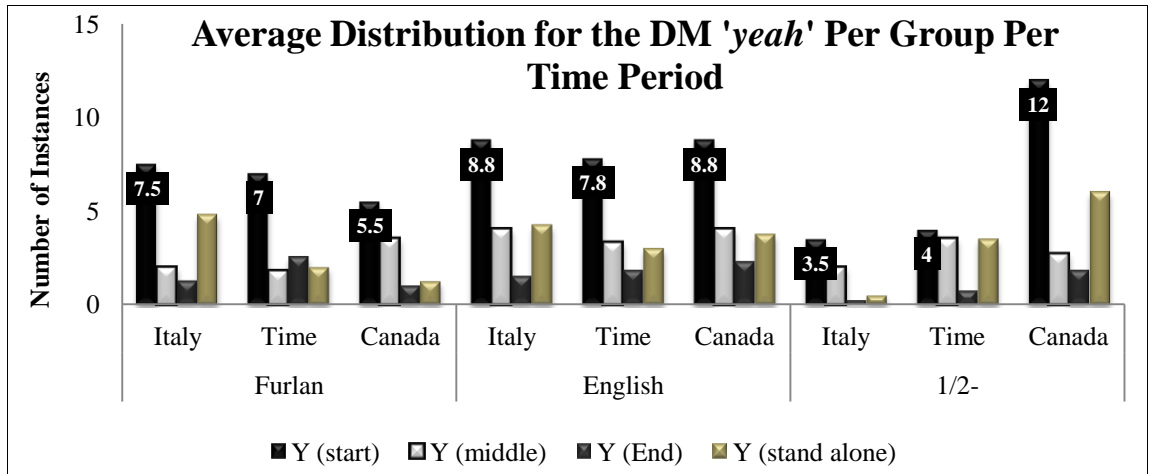
Figure 4.28 Note: See Appendix I for totals

To this point we have seen the frequency and distribution for the DMs '*sì*' and '*yeah*' as far as language-specificity and autobiographical memory, but we have not looked at the relationship between the DMs and code-switching. A further parse was done in order to see this relationship per group per time period.

The following graphs (figures 4.29 and 4.30) display overall ratios for each group regarding code-switching that occurred *within* and *between* the turns of speakers. Both DMs, '*sì*' and '*yeah*', were analyzed separately for switching that occurred before and after each occurrence.
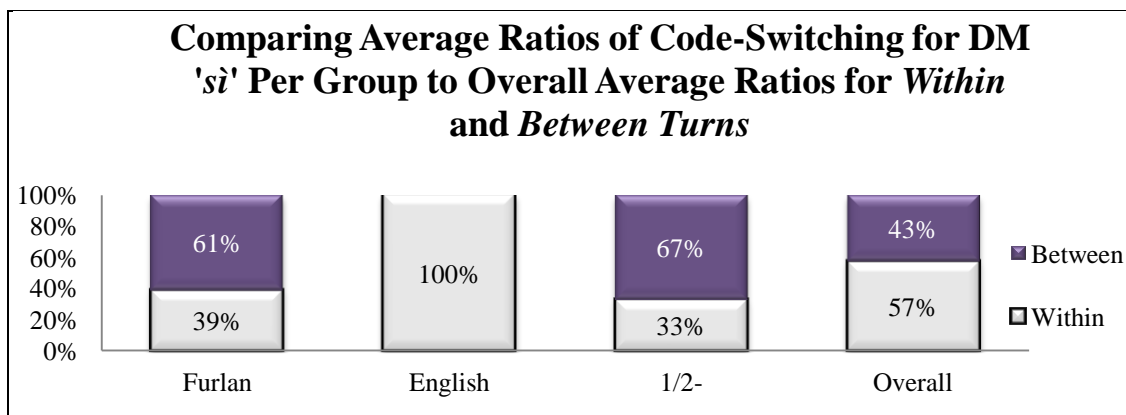
Figure 4.29 Note: See Appendix I for totals

Comparing Average Ratios of Code-Switching for DM 'yeah' Per Group to Overall Average Ratios for *Within* and *Between Turns*

	Furlan	English	1/2-	Overall
Between	53%	75%	52%	60%
Within	47%	25%	48%	40%
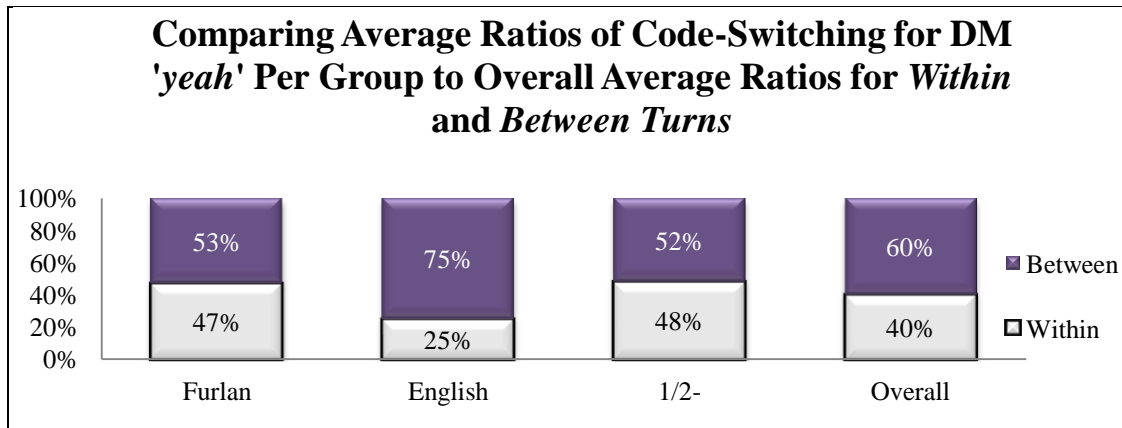
Figure 4.30 Note: See Appendix I for totals

Overall, the DM '*sì*' was used slightly more often *within* the turns of the speakers and the DM 'y*eah*' was used more often *between* speakers. After comparing these results to the previous results presented in objective two (figures 4.14 and 4.15), we see that the frequency and distribution for the DMs '*sì*' and '*yeah*', on average, per group patterned slightly differently. The frequency of switching before or after the DM '*sì*' was greater *within* turns, where we also find more switching in general (figures 4.14 and 4.15). Interestingly; however, many of the switches that took place before or after the DM '*sì*' involved the DM '*yeah*'.

> i.e. Fur-A/I: **sì/yeah/ *li e la nustra etat...*,**
>
> i.e. Fur-A-S: **/ yeah yeah/ *eh sì*).**

This begs the question *why*? Why was there a need for the participants in the *Furlan* group to repeat the DM in the other language? That group used '*sì*' more than '*yeah*', but because they also combined the two DMs in conversation, we cannot be sure of the language of the original trace. Further analysis of all DMs would be necessary in order to find out if other discourse markers pattern similarly to these ones and this is beyond the scope of the present study.

The analysis of my data in the first three objectives has shown that language-specificity was partially supported. Based on the total number of memories shared over the three time periods, only some participants recounted more memories for the time period when the language of the interview questions matched the time period of the

memory (see Table 4.2, p. 68). It was also discovered that many participants chose a language mode in which to recount their memories for all three time periods. Overall, language-specificity was both supported and not supported.

The data has further shown that code-switching took place broadly over many grammatical categories, yet patterns surfaced between types of turns (within and between) and also between types of switches (initial switch and switch back). When percent ratios were compared between participants' total numbers of memories and total numbers of switches per time period, it was discovered that for 13 participants, the highest scores for each grouping were the same. In other words, the time period with the greatest number of memories also had the greatest number of code-switches (see highlighted totals in Appendix H). This may indicate that the switching which takes place within and between bilinguals in natural conversation may not be due to language differentiation, but is due to speaking or processing abilities (innate patterns of behaviour) that are found in any bilingual (and perhaps any monolingual as well).

What was evident throughout the four objectives was that encoding specificity in this group of elderly bilingual immigrants was both supported and not supported, which is not surprising given the scope of this topic. Many factors are involved and must be considered around research involving bilinguals, so confirming results that support or reject the specificity principle is not realistic; at least it was not realistic in this study. Regarding language specificity, what can be noted (based on the results from this study) is that results varied depending on the type of data analysis performed. In objective one, for example, the group totals did not support language specificity, but individual totals did at 40%. Mixed results like these advocate for multidisciplinary approaches as many researchers have argued.

5 Conclusions and Further Research

Parsore dal nŭl a le simpri seren
[Above the clouds it is always bright]

5.1 What Code-switching tells us

In all its complexity and ambiguity, code-switching is, and continues to be, a fascinating phenomenon to many researchers in many disciplines, such as sociolinguistics, neurolinguistics, and anthropologists, to name just a few. It is no wonder that a unified theory has not yet been unanimously agreed upon; however, great strides have been made in efforts to answer the myriad questions put forth by researchers over the years. What is certain is that collaborative efforts are necessary (See Weinreich, 1964; Gardner-Chloros, 2009; Gardner-Chloros & Edwards, 2004) in order to address the complexity of this phenomenon so that one day perhaps researchers will be able to 'see the light above the clouds', or as they say in Furlan, *Parsore dal nŭl a le simpri seren*. The future is bright for code-switching research.

I stated at the beginning that it is easier to code-switch than to explain the theory behind it. After discussing the issues around bilingualism (see Bloomfield, 1933; Valdés, 1988; Clyne, 2003; Grosjean, 1989) and the discrepancies in code-switching theory and definitions (see Weinreich, 1964; Fishman, 1965; Gumperz, 1977; Poplack, 1980; Gardner-Chloros, 1991; Myers-Scotton, 1993; Bentahila & Davis, 1995; Alvarez-Càccamo, 1998; Auer, 1998; Franceschini, 1998; Jacobson, 1998; Muysken, 2000; and Gardner-Chloros, 2009), it is not hard to understand the truth of this statement. It is easier for bilinguals to code-switch than to explain why and how it is done, considering the compounding factors, methodological variations, levels of analyses and definitions involved. Also, perhaps the reality of code-switching is that there simply cannot be any ONE theory; the breadth of this phenomenon is far too great. This does not stop researchers from conducting qualitative research (as was done in this study) and collecting valuable data that reflects natural, spontaneous conversational code-switching.

Neurolinguistic research based on both healthy and pathological case studies, has provided an interesting glimpse of the location of code-switching in the brain. The principal questions asked by such research are: 1) where are languages stored in the brain; 2) what causes bilinguals to switch languages; and 3) and where exactly is the "switch" located? Common areas in the brain mentioned in the studies involving both healthy and pathological participants include the *left caudate nucleus* (see Abutalebi, Annoni, Zimine, Pegna, Seghier, Lee-Jahnke, et al., 2008; Abutalebi, Miozzo, and Cappa, 2000; Mariën, Abutalebi, Engelborghs and De Dehyn, 2005; Abutalebi and Green, 2008), the *prefrontal cortex* (see Abutalebi, Annoni, Zimine, Pegna, Seghier, Lee-Jahnke, et al., 2008; Abutalebi and Green, 2007, 2008) and *anterior cingulate* (see Abutalebi, Annoni, Zimine, Pegna, Seghier, Lee-Jahnke, et al., 2008; Briellmann, Saling, Connell, Waites, Abbott and Jackson, 2004; Fabbro, Skrap and Aglioti, 2000; Abutalebi and Green, 2007, 2008).

These three areas, the left caudate nucleus, the prefrontal cortex, and the anterior cingulate, are all found in the limbic system, where "it is accepted that the prefrontal cortex, amygdala, anterior cingulate cortex, hippocampus, and insula participate in the majority of emotional processes" (Roxo, Francescini, Zubaran, Kleber and Sander, 2011, p. 2428). Since case studies in both healthy and pathological subjects refer to parts of the brain found in the limbic system, and if the limbic system is commonly associated with emotional processes, can we perhaps suggest that code-switching is connected in some fundamental way to emotional processes as well?

The type of code-switching analyzed in this study was the kind found in natural conversation commonly heard among good friends and family, as I believe this to be '*natural*' code-switching (See introduction pp. 6-7). The methodology used to collect the data, both qualitative and quantitative, provided me with interesting and original results: interesting because certain patterns occurred throughout the four objectives and original because the combination of these two phenomena (code-switching and autobiographical memories) has not been directly investigated until the present study. Therefore, instead of questions being answered, more questions arose.

As mentioned, interesting results were found under each objective, which both supported and rejected current research in code-switching and autobiographical memory. The goal in the first objective was to record natural conversation in order to observe and quantify the number of memories shared and the languages used (Furlan or English) by elderly Italian immigrants in their recounting of autobiographical memories. The data would be explained in terms of language-specificity (based on the Encoding Specificity Principle by Tulving & Thomson, 1973). According to the total number of memories recalled per time period, the groups' totals did not provide evidence of language-specificity (see Table 4.1b). However, when individual total numbers of memories were observed, (regardless of which language was used to recount the memories), 40% of the participants reflected this principle (see Table 4.2). When languages were parsed per person, per time period, only 25% of the participants recounted their memories in the language that matched their memories, while 75% showed a greater preference for choosing one or the other language when recounting all memories (see Figures 4.6, 4.7, and 4.8).

The second objective was to quantify and highlight the overall instances of code-switching in the recorded conversations per group, per time period and observe the data on two levels: a) *within* the single speech turn for each participant; and b) *between* the speech turns of the participants. As was obvious from the samples provided above (and throughout the entire corpus), code-switching took place between different grammatical categories (both function and content categories, see Appendix E). It was found within a phrase, a clause, a sentence and between speaker turns. It was proportional between switch types (Switch 1/Switch 2) and between switch turns (*within* and *between*). This tells us that code-switching may not be conditioned by grammatical restrictions or rules, since it occurred liberally throughout the corpus. It may also not be the result of a mismatch between language spoken and language of encoded memories, since many participants simply continued with one language or the other for the entire conversation. In addition, code-switching may not even be influenced by language in general. Rather, it may manifest or pattern itself similarly to how we process thought as individuals.

Because the instances of code-switching were proportionally similar for *within* and *between* turns in all conversations (see Figures 4.15 and 4.16), it seemed not to matter whether the person switched as a result of what the other person was saying, or because of what they themselves said (or were thinking of saying).

The third objective was to analyze and compare instances of code-switching in bilingual autobiographical memory recall to the total number of recounted memories over the time periods *Italy, Time* of immigration, and *Canada*. When a comparison of ratios was made between the number of memories recalled and the number of code-switches per person, it was interesting to see that only three participants showed more code-switches (and more memories) when languages mismatched. Thirteen participants showed more code-switches (and more memories) when languages matched. Again, we see that code-switches may not be the result of mismatched languages, but of how we think and process our thoughts.

The fourth and final objective was to investigate (very briefly) the distribution and frequency of the discourse markers (DMs) '*sì*' and '*yeah*' per group, per time period as they related to language-specificity and code-switching. When the frequency was calculated for '*sì*' and '*yeah*' for each group, the *Furlan* group used '*sì*' the most (74%) overall. The Furlan group used '*sì*' more when recounting memories of *Time* and *Canada* rather than when recounting memories of *Italy*. Also, '*sì*' was used more at the beginning of the turn rather than in the middle or at end, as was the English DM '*yeah*'. What I did not expect were frequent repetitions of '*yeah*' after the use of '*sì*'. This may suggest an overall preference for the English DM '*yeah*', which does not support language-specificity for the time period *Italy*.

5.2 What autobiographical memories tell us

The application of neurocognitive research methods to the study of autobiographical memories and code-switching in combination has provided me with further evidence that may suggest a similar location in the brain for both code-switching and autobiographical memory. The *hippocampus/hippocampal complex* was an area of activation commonly

mentioned in a number of studies (see Fink, Markowitsch, Reinkemeier, Bruckbauer, Kessler, and Heiss, 1996; Maguire and Frith, 2003; Tsukiura, Fujiil, Okuda, Ohtake, Kawashima, Itoh, Fukuda and Yamadori, 2002; Greenberg, Rice, Cooper, Cabeza, Rubin, and LaBar, 2005; Rubin, 2005). In addition to the *posterior cingulate*, the *prefrontal* and the *insular corticies* were also mentioned, sometimes by the same authors (see Fink, Markowitsch, Reinkemeier, Bruckbauer, Kessler, and Heiss, 1996). Interestingly, these areas of the brain (the hippocampus, the cingulate, and prefrontal areas) are also components of the limbic system.

The overall results from the four objectives in the present study show partial support for language-specificity. About 40% of the participants recalled more memories when there was a match between the language of the interview and the language of the encoded memories, although they did not necessarily use the same language to recount as was used to encode the memory. In other words, the participants chose which language to use initially and used that language throughout the conversation. This, however, does not necessarily mean that the principle of encoding specificity is not true. Because the Italian immigrants in this study are elderly, they have spent more time learning and using the English language and may therefore use that more than Furlan. When I asked several of them after the interview in which language their early memories of *Italy* first came to them they answered 'Furlan', which would confirm language-specificity. This would also support the research on inner speech, as per Larsen et al., 2002 (see p. 47). However, some of them recounted their early memories of *Italy* in English (about 50%), which was similarly reflected in the questionnaire results of use of Furlan (almost 50% use Furlan 'half the time' or more 'nowadays', see Figure 4.2, p. 62). Therefore, we cannot confirm that the principle is either supported or not supported, since we have participants manifesting language-specificity and other who are not. Further research would be necessary to investigate the impact of 'inner speech' in elderly immigrants on code-switching and autobiographical research.

5.3 Combining methodologies

Multidisciplinary approaches are needed in order to better understand code-switching; researchers need to think outside the box. It is worth reiterating the words of Gardner-Chloros (2009) who said that we need to look at all areas of inquiry regarding code-switching and that "its study should contribute to putting interdisciplinarity on the linguists' map at last, and in the process...to a small and much-needed methodological revolution" (p. 180). This is especially important when new ideas are explored, which is something I considered paramount in the present study. Combining the results of neurocognitive research in code-switching and autobiographical memory recall in order to find out in which part or parts of the brain these two processes take place may be far-reaching, but it is worth exploring nevertheless. By doing so, I discovered that the cingulate cortex (a part of the limbic system) was one area of the brain mentioned as the location of processes for both code-switching studies (healthy and pathological) and autobiographical memory recall studies.

The cingulate cortex and its specialized function was investigated extensively by Bechmann, Johansen-Berg, & Rushworth (2009) who used fMRI along with performing a meta-analysis of 171 studies reporting cingulate activation. They discovered interconnections between the cingulate cortex and 11 regions: the amygdala, the hippocampus, the hippothalamus, to name a few. Also, they discovered that activation in the anterior cingulate reflected success with memory encoding and retrieving and the posterior region reflected facets of episodic memory and showed a high interconnection with the hippocampus.

Years earlier, a study by Pardo, Pardo, Janer, & Raichle (1990) revealed strong activation in the anterior cingulate cortex based on PET scan results from the classic Stroop color/word task. They concluded that this area played a strong role in "attentional processing through the selection and recruitment of processing centers appropriate for task execution" (p. 256).

If the cingulate cortex, and its strong connection to the hippocampus (an area commonly mentioned in code-switching studies) is reflected in studies involving memory

and task execution (the two above mentioned studies) and if this area of the brain is also mentioned in other studies of code-switching and autobiographical memory (discussed in section 2 and 3), could we posit that the cingulate cortex plays a role in both phenomena? If both activate the cingulate cortex, there must be a shared connection that is responsible for both functions, yet reflects the 'self' (as portrayed in autobiographical memories, for example).

A bilingual's frequency and distribution of code-switching and autobiographical memories may not be primarily influenced by external factors, such as language proficiency or mismatch, but occur as a result of individual thought processes, which could similarly occur in monolinguals if 'code' were to include register, levels of formality, for example.

Advanced technology in neurolinguistics (i.e.: fMRI, MEG) has helped researchers explore aspects of bilingual code-switching and autobiographical memory recall especially with respect to the brain area(s) responsible for language switching in multilingual aphasics. However, as Paradis (2004) remarked caution is in order since "at best, neuroimaging provides us with circumstantial evidence, and like all circumstantial evidence, its credibility rests on the amount of converging data from other sources" (p. 153). Although caution is in order, we need to incorporate neurocognitive and sociolinguistic studies pertaining to code-switching and autobiographical memory recall in bilinguals in order to better understand the complexity of such fascinating phenomena.

5.4 Further research

What does code-switching in spontaneous conversation involving the recall of autobiographical memories tell us? It tells us that we need to look beyond the current code-switching theories, which define the rules and restrictions that explain where code-switching is permitted or not permitted. We need to look beyond code-switching theory that builds its premise on a phrase or clause only and consider the naturally occurring code-switching found in spontaneous discourse. Furthermore, it is essential to broaden

our observation and engage in multidisciplinary approaches in the research involved in spontaneous code-switching in discourse.

Code-switching is not a by-product of mismatched languages or bilingual competence, nor is it the by-product of grammatical category restrictions. It is my belief that it is a reflection of "something greater", some exclusive thought process (brain circuit involving the cingulate cortex), that becomes engaged with each memory encoded and each memory retold, which integrates language and language switching as necessary to communicate our exclusive thoughts. In other words, code-switching and autobiographical memories are managed by our 'self schema', our 'personal interpretation' and the language or languages we use and the switching that takes place when we communicate these memories are determined by our 'selves' or how we see our 'self'.

It is my suggestion that researchers continue to investigate code-switching from many different angles and to explore this phenomenon using various methodological procedures, as was done in this current study. Further research would involve replicating this experiment with other elderly Italian or other culture groups (Spanish or French immigrants, for example) in order to test this 'far-reaching' yet interesting hypothesis. In 1954 Vogt said that "Code-switching in itself is perhaps not a linguistic phenomenon, but rather a psychological one, and its causes are obviously extralinguistic" (p. 368). I would have to agree, although with some hesitation. I also believe that language influences thought (and vice versa), which leads us to the Sapir-Whorf argument on the relationship between thought and language and what comes first. This argument does not fit into this study, but it is food for thought for future research.

Appendix A   Demographics about the Participants in this Study

Participant	A	B	C	D	E	F	G	H
Fur-A-S	S. Vito Al T.	1962	21	Homemaker	F	Italian	Furlan	Italian
Fur-A-I	Ramuscello	1958	21	Factory worker	F	Italian	Italian	Italian
Fur-B-G	Roveredo di Varmo	1954	15	Canada Steamship then construction	F	Furlan	Furlan	English
Fur-C-Ge	S. Vito Al T.	1960	30	Burlington steel	F	Furlan	Furlan	Italian
Fur-C-Gi	S. Vito Al T.	1964	27	Andrés Wines	F	Furlan	Furlan	Furlan
Eng-A-N	Rivignano	1950	10.5	Bell Canada	E	Furlan	English	English
Eng-A-D	Rivignano	1950	4	School till university then teacher	E	Furlan	English	English
Eng-B-B	Pozzo	1952	11	On farms	E	Fur & Eng	Fur & Eng	Italian
Eng-B-L	Lavoredo di Varmo	1955	9	Office worker	E	English	English	English
Eng-C-O	Pozzo	1952	10	Stelco	E	English	English	English
Eng-C-L	Pozzo	1952	6.5	No information given	E	English	English	English
½-A-S	Maiano	1951	20	Steel mill	1/2	Furlan	Furlan	Italian
½-A-A	Maiano	1954	17	mechanic	1/2	Furlan	Furlan	English
½-B-R	Zompicchia	1953	20	Painting business	1/2	Furlan	All 3	Furlan
½-B-E	Gorizzo	1956	19	Factory as a sewer	1/2	Furlan	All 3	Italian
½-C-M	Biauzzo	1962	21	Homemaker	1/2	Italian	Italian	Italian
½-C-A	Roveredo di Varmo	1962	18	Nick Corado and Tip Top	1/2	Fur & Ital	Fur & Ital	Italian
½-D-A	San Lorenzo	1965	18	Construction	1/2	Furlan	Furlan	English
½-D-M	Roveredo di Varmo	1956	6	Stelco	1/2	English	English	English
Omitted*	San Daniele	1956	22	Furnace construction	E	Furlan	Furlan	English
Omitted*	San Daniele	1959	21	Lunch room vending machines- maintenance	E	Furlan	Furlan	Italian

Note: two participants were omitted from the study because parts of their conversation were not clearly audible.

A=Town of birth, B=Year of immigration, C=age at immigration, D=Occupation in Canada, E=allocated group, F=the language they enjoy speaking, G=the language that is easier to speak, H=the language used for basic math calculations

Appendix B

Figure 1 **Questions About Furlan (from the questionnaire)**

0-4 yrs	6	When you were very young (0-4 yrs), how often did you speak that language at home? (Furlan)
5-11 yrs	13	When you were a child (5-11 yrs), how often did you use Furlan at home?
Teenager	16	When you were a teenager, how often did you use Furlan at home?
Young adult	22	When you were a young adult, how often did you use Furlan at home?
Canada 1ˢᵗ year	26	During your first year in Canada, how often did you use Furlan at home?
Canada +5 years	34	After 5 years in Canada, how often did you use Furlan at home?
Canada +10 years	36	After 10 years in Canada, how often did you use Furlan at home?
Canada +20 years	38	After 20 years in Canada, how often did you use Furlan at home?
Canada Nowadays	43	Nowadays, how often do you use Furlan at home?

Figure 2 Questions About English (from the questionnaire)

Canada 1ˢᵗ year	27	During your first year in Canada, how often did you use English at home?
Canada +5 years	35	After 5 years in Canada, how often did you use English at home?
Canada +10 years	37	After 10 years in Canada, how often did you use English at home?
Canada +20 years	39	After 20 years in Canada, how often did you use English at home?
Canada Nowadays	44	Nowadays, how often do you use English at home?

Appendix C

Total Number of Memories Recounted Per Time Period Per Person

	ITALY	TIME	CANADA
Fur-A-S	1306	812	1050
Fur-A-I	1980	1419	1213
Fur-B-G	1086	1310	2571
Fur-C-Ge	326	514	294
Fur-C-Gi	389	369	596
Eng-A-N	1827	1910	734
Eng-A-D	276	840	1886
Eng-B-B	2475	1596	683
Eng-B-L	738	1474	1229
Eng-C-0	2061	783	2000
Eng-C-L	1023	300	806
1/2-A-S	1322	780	886
1/2-A-A	1161	1890	1887
1/2-B-R	1610	1910	1867
1/2-B-E	762	1454	2111
1/2-C-M	2723	621	2266
1/2-C-A	2597	847	2153
1/2-D-A	470	300	1882
1/2-D-M	387	737	1489

Note: Number of memories = number of words spoken during the interview portion of the study

Appendix D   Results From Samples That Reflect Code-Switching *Within* and *Between* Turns

	Within Turns			*Between* Turns			Grand Totals
	SW 1	SW 2	Total	SW 1	SW 2	Total	
Total # of switches per switch type	30 (53.6%)	26 (46.4%)	56	20 (57.1%)	15 (42.9%)	35	91
Total # of grammatical categories	23 (54.8%)	19 (45.2%)	42	16 (57.1%)	12 (42.9%)	28	70
	Totals and Ratios for SW1/SW2		Total	Totals and Ratios for SW1/SW2		Total	
N__	7	31.8%	15	68.2%	22	7	58.3%	5	41.7%	12	34
__N	11	78.6%	3	21.4%	14	1	100%	0	0%	1	15
V__	8	100%	0	0%	8	2	66.7%	1	33.3%	3	11
__V	2	50%	2	50%	4	1	33.3%	2	66.7%	3	7
Adv__	1	100%	0	0%	1	3	100%	0	0%	3	4
__Adv	2	50%	2	50%	4	1	100%	0	0%	1	5
Adj__	0	0%	6	100%	6	3	100%	0	0%	3	9
__Adj	1	100%	0	0%	1	0	0%	0	0%	0	1
Prep__	3	75%	1	25%	4	1	50%	1	50%	2	6
__Prep	3	75%	1	25%	4	2	66.7%	1	33.3%	3	7
ProN__	1	100%	0	0%	1	1	33.3%	2	66.7%	3	4
__ProN	1	12.5%	7	87.5%	8	2	40%	3	60%	5	13
DM__	6	66.7%	3	33.3%	9	2	40%	3	60%	5	14
__DM	6	42.9%	8	57.1%	14	11	57.9%	8	42.1%	19	33

Note: SW = Switch, SW1 = initial switch, SW2 = switch back
The totals reflect the grammatical categories, which displayed the greater frequency found in the selected examples provided.

Appendix E Inventory of Grammatical Categories where Switches Occurred

Category	Within SW 1	Within SW 2	Between SW 1	Between SW 2
N/Det	*	*	*	
N/N	*	*	*	
N/V	*	*	*	
N/Rel		*		
N/ProN		*		**
N/Prep		*	**	*
N/DM	***	****	*	*
PN/N		*		
PN/ADV		*		
PN/ProN		**		
PN/DM	*	*	*	*
V/Det	*			
V/N	**			
V/Rel	*			
V/ProN			*	
V/Adv	*			
V/Adj	*			
V/DM			*	
V/V				*
V/Prep	**			
Det/PN	**			
Det/DM			*	
Adj/Adv		*		
Adj/Det		*		
Adj/ProN		*		
Adj/DM		***	***	
ADV/ADV			*	
ADV/DM	*		**	
Prep/N	*			
Prep/PN	**	*		
Prep/Conj			*	
Prep/DM				*
ProN/V				*
ProN/DM	*		*	*
DM/N	*			
DM/V	*	*		
DM/Prep	*			
DM/ProN	*	**	*	
DM/Adv	*			
DM/Rel	*			
DM/DM			*	***
Tag/ProN		*		
Tag/DM				*
Neg/Det				*
Neg/ProN				*
Poss/N	*			
Dem/N	*			
Total #Switches	30	26	20	15

Appendix F
Code-Switching Totals and Averages Per Person Per Time Period Per Category
(*Within* **and** *Between Turns*)

	CS *Within Turns*			Total per person	*Within turns* per conversation	*Between Turns* Only
	Italy	Time	Canada			
Fur-A-S	83	62	70	215	215+235=450	232
Fur-A-I	90	78	67	235		
Fur-B-G	9	55	46	110	110	32
Fur-C-Ge	4	34	14	52	52+108 = 160	60
Fur-C-Gi	18	31	59	108		
Totals	204	260	256	720	720	324
Averages	40.8	52	51.2	144	240	108
Eng-A-N	43	5	11	59	59+80=139	20
Eng-A-D	3	11	66	80		
Eng-B-B	19	2	4	25	25+7=32	4
Eng-B-L	0	6	1	7		
Eng-C-0	24	4	58	86	86+45=131	12
Eng-C-L	30	0	15	45		
Totals	119	28	155	302	302	36
Averages	19.83	4.66	25.83	50.33	100.7	12.3
1/2-A-S	76	28	26	130	130+88=218	97
1/2-A-A	38	2	48	88		
1/2-B-R	50	47	34	131	131+226=357	44
1/2-B-E	32	79	115	226		
1/2-C-M	35	29	72	136	136 + 232= 368	183
1/2-C-A	98	49	85	232		
1/2-D-A	3	17	71	91	91 + 63 = 154	55
1/2-D-M	0	30	33	63		
Totals	332	281	484	1097	1097	379
Averages	41.6	35.12	60.5	137.2	274.5	94.8
Grand Total for CS Within Turns for All Groups for All Time Periods						2119
Grand Total for CS Between Turns for All Groups for All Time Periods						739
Grand Total for CS (both categories) for All Groups for All Time Periods						2858

Note: CS = Code-Switching

Appendix G   **Code-Switching Data Per Conversation Per Group and Totals**

	Fur A	Fur B	Fur C	Eng A	Eng B	Eng C	½ A	½ B	½ C	½ D
Within Totals	450	110	160	139	32	131	218	357	368	154
Between Totals	232	32	60	20	4	12	97	44	183	55
Totals Per Conversation	682	142	220	159	36	143	315	401	551	209
Within Ratios (%)	66%	77.5%	72.7%	87.4%	88.9%	91.6%	69.2%	89%	66.8%	73.7%
Between Ratios (%)	34%	22.5%	27.3%	12.6%	11.1%	8.4%	30.8%	11%	33.2%	26.3%
Average % Ratios per Group for *Within*	72.1%			89.3%			74.7%			
Average % Ratios per Group for *Between*	27.9%			10.7%			25.3%			
Average % Ratio for *Within*	78.7%									
Average % Ratio for *Between*	21.3%									

Appendix H

Total Number of Code-Switches (*Within Turns*) Per Person Per Time Period

	Fur-A-S	Fur-A-I	Fur-B-G	Fur-C-Ge	Fur-C-Gi	Eng-A-N	Eng-A-D	Eng-B-B	Eng-B-L	Eng-C-O	Eng-C-L	1/2-A-S	1/2-A-A	1/2-B-R	1/2-B-E	1/2-C-M	1/2-C-A	1/2-D-A	1/2-D-M
CANADA	70	67	46	14	59	11	66	4	1	58	15	24	48	34	115	72	85	71	33
TIME	62	78	55	34	31	5	11	2	6	4	0	28	2	47	79	29	49	17	30
ITALY	83	90	9	4	18	43	3	19	0	24	30	76	36	50	32	35	98	3	0
Total#	215	235	110	52	108	59	80	25	7	86	45	131	88	131	226	136	232	91	63

Appendix I   **Distribution of Discourse Markers** *'sì'* and *'yeah'*

	Time Period	Distribution of the Discourse Markers 'sì'(S) and 'yeah' (Y)												CS With 'sì'(S) and 'yeah' (Y)					
		Start of Turn		Middle of Turn		End of Turn		Stand Alone		Total		Within		Between		Total			
		Y	S	Y	S	Y	S	Y	S	Y	S	Y	S	Y	S	Y	S		
Fur-A-S	Italy	20	3	2	0	5	1	15	0	42	4	17	2	44	0	61	2		
	Time	13	4	3	1	6	1	5	2	27	8	15	1	24	3	39	4		
	Canada	12	7	8	0	2	2	4	1	26	10	18	4	19	0	37	4		
Fur-A-I	Italy	7	3	5	0	0	0	4	4	16	7	11	1	4	1	15	2		
	Time	10	5	4	3	2	1	1	1	17	10	18	2	8	4	26	6		
	Canada	7	3	3	0	1	3	1	4	12	10	12	1	9	5	21	6		
Fur-C-Ge	Italy	1	0	0	1	0	0	0	0	1	1	1	0	0	0	1	0		
	Time	1	1	0	0	0	0	2	1	3	2	0	0	0	1	0	1		
	Canada	2	1	0	1	1	0	0	1	3	3	1	0	2	2	3	2		
Fur-C-Gi	Italy	2	1	1	0	0	0	0	0	3	1	0	0	1	1	1	1		
	Time	4	1	0	2	2	0	0	0	6	3	4	0	2	0	6	0		
	Canada	1	0	3	1	0	0	0	0	4	1	6	0	1	0	7	0		
Eng-C-O	Italy	8	0	2	0	3	0	5	0	18	0	0	0	0	0	0	0		
	Time	5	0	0	0	2	0	1	0	8	0	0	0	0	0	0	0		
	Canada	5	0	4	0	4	0	1	0	14	0	0	0	0	0	0	0		
Eng-C-L	Italy	9	0	5	1	2	0	4	0	20	1	0	1	0	0	0	1		
	Time	0	0	2	0	0	0	2	0	4	0	0	0	0	0	0	0		
	Canada	6	0	3	0	1	0	1	0	11	0	0	0	0	0	0	0		
Eng-A-N	Italy	13	0	9	0	1	0	6	0	29	0	1	0	0	0	1	0		
	Time	16	0	9	0	2	0	6	0	33	0	0	0	0	0	0	0		
	Canada	8	0	3	0	2	0	9	0	22	0	0	0	0	0	0	0		
Eng-A-D	Italy	5	0	0	0	0	0	2	0	7	0	0	0	2	0	2	0		
	Time	10	0	2	0	3	0	3	0	18	0	0	0	1	0	1	0		
	Canada	16	0	6	0	2	0	4	0	28	0	0	0	0	0	0	0		
½-D-A	Italy	2	0	0	0	0	0	0	0	2	0	2	0	0	0	2	0		
	Time	2	1	1	2	0	0	0	0	3	2	3	0	0	0	3	0		
	Canada	10	2	1	1	0	1	5	1	16	5	6	0	5	3	11	3		
½-D-M	Italy	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0		
	Time	10	0	5	0	1	0	10	0	26	0	0	0	3	0	3	0		
	Canada	23	0	7	0	4	1	12	0	46	1	6	0	11	0	17	0		
½-B-R	Italy	7	1	5	3	0	0	1	1	13	5	2	2	3	2	5	4		
	Time	6	0	5	2	0	0	3	0	14	2	1	0	2	0	3	0		
	Canada	6	2	0	1	1	0	4	1	11	4	0	2	1	3	1	5		
½-B-E	Italy	5	0	2	0	1	0	1	0	9	0	1	0	0	0	16	0		
	Time	10	0	3	0	2	0	1	0	16	0	3	0	3	0	6	0		
	Canada	9	1	3	0	2	0	3	0	17	1	3	0	1	0	4	0		

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