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How Multilinguals Perceive Linguistic Interference

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By

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ABSTRACT

When someone begins a third (or nth) language they often struggle to inhibit previously learned languages, something that established multilinguals do without much difficulty. In this qualitative survey encompassing 298 multilinguals representing different languages, proficiency levels, and learning histories, an attempt was made to identify what strategies, if any, multilinguals are aware of using which help them to successfully inhibit competing lexemes from non-target languages, with the goal of identifying strategies or commonalities that may assist budding multilinguals.

Multilinguals reported noticing their interference most in conversing and mostly as applied to vocabulary; however, for most it did not occur very frequently nor was it found very frustrating. While any language has the potential to be the source language, the source language tends to be a non-native language that is dominant, was started earlier, and/or was similar to the target language. On the whole, participants had positive or neutral attitudes towards their interference. Most had not asked for advice in coping with it, and most were not aware of any strategies they may use. The strategies reported can be divided into strategies for students (cognitive, preparatory, and communication), and implications for teachers at the classroom and individual levels. Further research is necessary to test these strategies and to more deeply explore the relationship between source and target language.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

In a lesson on classroom vocabulary, the teacher holds up a book, asking "Qu'est-ce que c'est?" (What is this?), and a student in the front row confidently answers, "das Buch!" The teacher looks at him quizzically, some of his classmates fail to stifle a giggle, and the student repeats, even more confidently, "das Buch!" And it still takes him a minute to realize that he had the right answer but in the "wrong" language. All confidence disappears from his body language: he covers his face, slumps down in his seat, avoiding any interaction for the remainder of the class period.

He was not factually wrong—a book is "ein Buch" is "un livre"—the language of the word does not change the meaning of the word[1] (de Saussure, 1959).The student's basic but more established knowledge of German superseded his developing knowledge of French. In other words, he experienced linguistic interference: his German interfered with his French. This student struggled with interference throughout the semester; based on our many conversations on the subject, it caused him a great deal of frustration. I, as his teacher, had no resources or information on how to help him mitigate or minimize it.

1.2 Background of the Problem

[1] At least in this case. Some concepts are more nuanced and do not translate as easily, in which case there could be a slight shift in meaning.

The existing research describes how, why, and when interference may happen (e.g. Hammarberg, 2001; de Angelis & Selinker, 2001; Ringbom, 2001; Dewaele, 2001; Cenoz, 2001; Fouser, 2001; Kellerman, 2001; Burton, 2013; Schönpflug, 2003; Jessner, 2003; Wei, 2003; Dijkstra, 2003; Rothman, 2010;Gabrys-Barker, 2006; Dewaele, 1998; Yamasaki & Prat, 2014; Wei, 2006; van den Noort et al, 2014; Marian, Blumenfeld, Mizrahi, Kania & Cordes, 2013; de Angelis, 2005; Proverbio, Roberta & Alberto, 2007; Blumenfeld & Marian, 2013; Aparicio & Lavaur, 2014; Odlin & Jarvis, 2004; Peyer, Kaiser & Berthele, 2010; Tullock & Fernández-Villanueva, 2013; Ecke & Hall, 2012; Selinker & Baumgartner-Cohen, 1995). However, it fails to address the more practical application of what, if anything, a language learner can do to address it. The conditions in which interference occurs are normal elements of communication and cannot be avoided. While interference tends to diminish in frequency as a speaker becomes more proficient, that fact does little to assuage the concerns of the novice.

1.3 Purpose

The purpose of this study is to examine how multilinguals experience interference, the ways in which it affects their language learning and communication, their attitudes toward it, as well as to identify strategies they may use to help them cope with it, in the hopes that this knowledge may be beneficial to budding multilinguals in dealing with their own language transfer. Learning a language is a challenging task, and learning multiple languages even more so, as it presents new and different challenges in managing the influence from other non-native languages. Students normally do not expect this cross-linguistic influence to occur, they have no reason to expect it. The ability to keep two languages separate seems very basic to those who have not studied

second language acquisition. The student beginning their third language faces an additional challenge in dealing with this unexpected influence from their second language, which sometimes helps but sometimes does not.

1.4 Definitions

Interference, also called transfer or Cross Language Influence, is the manifestation of knowledge of a non-target language in the target language. It can occur across all modes of communication, and in multiple ways, including the presence of a single word in the other language, the mixing of verbs of language A with conjugation patterns of language B, syntax, or pronunciation, to give a few general examples. Interference can be either positive or negative. One can use knowledge of one language to make guesses about how another might work, the difference between the positive or negative weight depends on if the guess is correct or incorrect, if it is ultimately helpful or counter-productive. A native speaker of English who is proficient in French and learning Spanish might guess that the Spanish verb “explicar” (to explain) does not take a preposition when used with a direct object because its French equivalent “expliquer” does not take a preposition in the same circumstance. As this guess is correct, this is an example of positive transfer from the L2. However, this influence is not always beneficial. The same speaker may encounter the Spanish word “langostino” (large shrimp, prawn) for the first time and guess that it means the same thing as the French “langoustine” (lobster). As this is incorrect, this is an example of negative transfer. Paradoxically, the L1 would have been a better source of transfer, as in English “langoustine” has the same meaning as the Spanish “langostino.”

Furthermore, transfer can also be intentional or accidental. When it is intentional, it is actually lexical borrowing: a word of the intended meaning does not exist in the target language but does exist in another language known to the speaker (Holmes, 2001). Sometimes these words ultimately enter the target language, as the German *Schadenfreude* has entered English to describe enjoyment of the suffering of others. This process likely begins with speakers who know both languages, and are dissatisfied with the gap in the lexicon of language A (in this case, English) compared to language B (German). There is no satisfactory translation of 'awkward' in French—*maladroit* can be used in the physical sense, but better translates to clumsy; *mal à l'aise* can be used in the discomfort sense, but better translates to uncomfortable. Neither of these possibilities capture 'awkward' in the sense of causing difficulty or embarrassment, or the idea that these four nuances can be entwined. Because of this gap in the language, sometimes speakers of both French and English will use the English word in an otherwise French utterance: *Il était si awkward, je n'avais pas le cœur de le refuser* (He was so awkward (English), I didn't have the heart to refuse him). This speaker prefers the layered nuance expressed by the English word; using *mal à l'aise* or *maladroit* wouldn't feel or mean the same, or be as satisfying. While 'awkward' has yet to enter the lexicon of French speakers who do not also speak English, it has the potential to do so.

Accidental interference occurs when there is a suitable word in the target language, but the speaker either cannot think of it in the moment, does not know it at all, or is confused as to which language the uttered word belongs. In these cases, the word may present itself in another language known to the speaker. In the first paragraph of this chapter, I provided an example of a student who used "das Buch" instead of the

target “le livre;” an outsider cannot determine concretely if the speaker experienced a temporary memory lapse or if they just didn’t know the word. Even in this particular example, *le livre* was included in the vocabulary for the chapter at hand and the student was expected to be in the process of acquiring this word, among others. It cannot be ascertained if this student had been studying this word and experienced a momentary lapse, or if the target structure had not been included in the vocabulary that he had studied up to that point. The third possibility is that the student had both *das Buch* and *le livre* in mind, and mistakenly believed *das Buch* was French. More than a year later, it is unlikely that the student would be able to provide any clarification.

While transfer does exist, it does not always present itself in the output every time it occurs in the speaker’s thought process; at times, it is successfully inhibited. A speaker may recognize that the word they have found belongs to a non-target language before speaking it, and continue searching for the word in the target language. This is still interference; it is interference that has been successfully inhibited. This project primarily focuses on this unintentional lexical interference. The intent was to encompass both interference that was present in the output as well as interference that was successfully inhibited; however, as the data is self-reported the actual results are reflective of the participant’s understanding of the term. It cannot be ascertained that everyone understood that these are both examples of interference.

For the purposes of this study, “multilingual” is defined rather loosely as anyone with knowledge of three or more languages. No proficiency threshold was set, because interference can occur at any proficiency level. Most participants in this study are additive multilinguals; that is, they began their languages successively rather than

simultaneously. One example of an additive multilingual is a native speaker of English who started French at the age of 14, Spanish at 16, and German at 21. Simultaneous multilinguals learned their languages at more or less the same time. One such example is a Senegalese, who grew up speaking both Wolof and Pulaar as native languages, and started French (the country's official language) in early childhood, at the age of 4.

1.5 Application of Results

The results of this study may aid a learner beginning a third language in overcoming this particular challenge until they become sufficiently proficient that they are better able to guess when the interference or cross-language influence will be beneficial as opposed to when it will be disadvantageous.

1.6 Summary

This is a qualitative study of participants who consider themselves to be multilingual; primarily an online survey, with a select number of respondents participating in follow-up interviews. This chapter introduced the purpose and goal of the study. Chapter two examines the existing researching pertaining to interference in multilinguals: how multiple languages are organized within one brain, language production models, lexical organization models, language activation theories, an examination of when transfer occurs, the inhibitory control mechanism, and how the source language is selected. Chapter three describes the methods and the participants in detail, as well as how the data was collected and analyzed. The discussion of the data is found in chapter four, with conclusions and limitations following in chapter five.

CHAPTER 2: LITERATURE REVIEW

The existing literature has examined how and why cross-linguistic interference occurs, but it has not addressed how it is experienced by the speaker. We can describe how output may be produced, the potential components of the mental lexicon's organization, the demonstration of the simultaneous activation of multiple known languages, in what circumstances and in which languages interference may occur, and the fact that there seems to be an inhibitory control mechanism that can prevent interference from being present in the output. While this is valuable information to have, it removes the human element from what is essentially a human behavior. Linguists have studied interference or transfer or cross-linguistic influence for years, often through the lens of error analysis, which seems to imply a negative judgment; but do multilinguals view it as a negative? What can an individual's experiences with interference tell us about the phenomenon?

2.1 Language Production Models

The fact that cross-linguistic influence, both positive and negative, is possible is considered sufficient evidence for a single system encompassing all languages in the multilingual condition (de Bot, 2004; Ludy & Py, 2009; Proverbio, Roberta, & Alberto, 2007; Burton, 2013). Levelt was among the first psycholinguists to investigate spontaneous speech production. His model (1989), shown in Figure 1, is the basis for de Bot's model (1992), so we will start with it. In the *Conceptualizer*, *Message generating* represents the process of selecting the idea to be verbalized. Levelt imagines this as functioning within the parameters of Boolean logic, "If the intention is to commit oneself to the truth of *p*, THEN assert *p"* (Levelt 1992, p10), or a set of condition/action

pairs. If a speaker wanted introduce an idea in an engaging way, then they might make a declarative statement that appears to be in opposition to the truth: The sky is not blue. *Monitoring* is the adaptation of that idea to the situation, audience, and discourse style. In an academic paper, our example would need to be reformulated to be more formal, more specific, and more accurate. The output of the *conceptualizer*, or preverbal message—here, the fact that we are going to appear to lie about the color of the sky and are going to do so using the conventions of academic language—becomes the input for the *formulator*, which translates the idea into a linguistic structure. Levelt describes this as occurring in two consecutive steps, grammatical encoding and phonological encoding; in both steps, the lexicon is called upon to supply the relevant lexemes/lemmas. Our same example might become: Contrary to what is observable by the naked eye, the sky is not actually blue; but rather it is colorless and appears to be blue because of the manner in which the molecules in the sky scatter sunlight. Our hypothetical speaker has drawn on their grammatical and lexical knowledge to formulate this sentence, and their phonological knowledge in how to pronounce it. The *Working Memory, Syntactic Buffer, and Articulatory Buffer,* though not depicted in the model, serve as temporary storage for the results of the *Message Formulator, Grammatical Encoding,* and *Phonetic Encoding,* respectively. The output of the formulator becomes the input for the articulator, in which the message is articulated.

The right hand side of the diagram describes the self-monitoring process; the speaker as his/her own audience. The first component is the audition, or the verification that the speaker can understand their own message. According to Levelt's model, the audition process puts out a phonetic string, which is then sent through the *Speech-*

Comprehension System, which in turn draws on the lexicon to connect the words to their respective meanings. Finally, the *Speech-Comprehension System* sends feedback to the *conceptualizer*. This model does differentiate between declarative and procedural knowledge (Levelt, 1989). In Levelt's model, boxes represent processing components while circles represent knowledge stores. Levelt does not define either term.

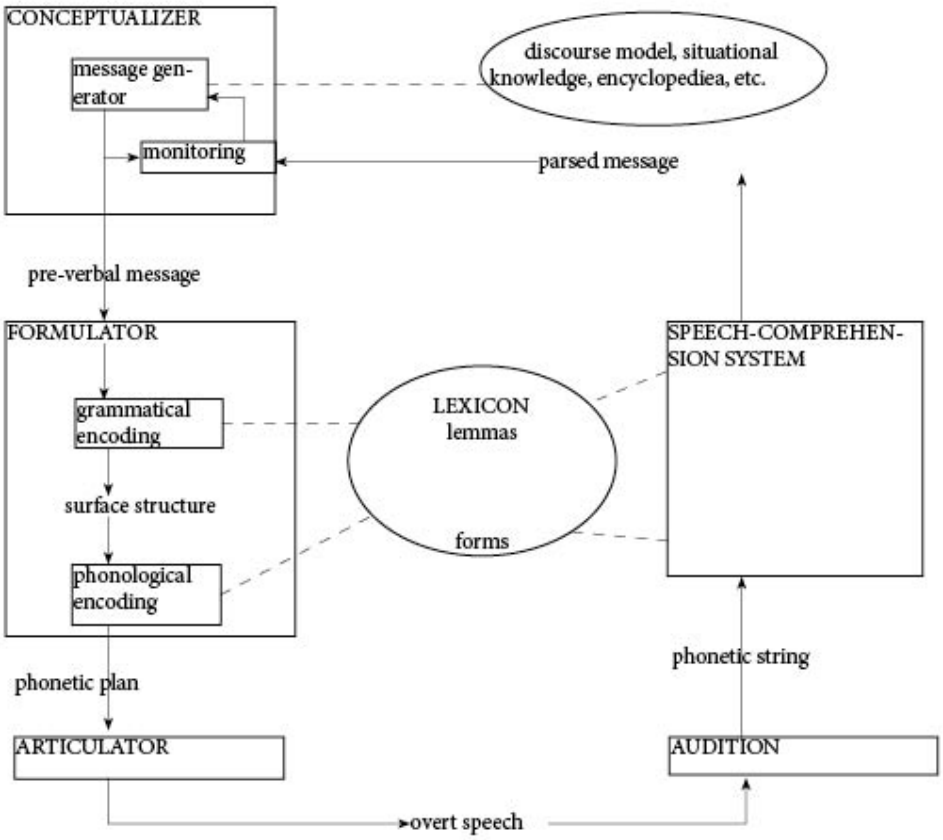

Figure 1: Levelt's Model, adapted from Levelt (1989)

In the preface of the book in which Levelt proposes the model, he is very upfront about the fact that this is an initial attempt to apply an overarching psycholinguistic framework to spontaneous speech production, and acknowledges the fact that it is inherently "incomplete and theoretically wanting" (Levelt 1989, p. xiv). Levelt's model

may be better suited to describe how artificial intelligence might speak than how human beings actually speak. It treats the process as strictly linear and logical, although humans do not behave in strictly linear and logical ways (de Bot, 1992). It is difficult to critique Levelt's model without also critiquing his explanation of it: he uses non-standard terms (processing components, knowledge stores) without defining or explaining them (de Bot, 1992). Other weaknesses of Levelt's model include the fact that it is a steady-state model, that is, it does not describe or attempt to describe the behaviors of learners or of children and teenagers (de Bot, 1992); it is not concerned with reading or writing; it excludes language disorders of a central or peripheral nature (de Bot, 1992). Levelt's model is incomplete; it only accounts for the speech of adult monolinguals who are neurologically normal (Levelt, 1989).

While it is based on empirical monolingual data (Levelt, 1989), Levelt did not specify if he intended his model to apply only to monolinguals or more broadly to bi- and multi-linguals; as a result of this lack of clarity, different linguists have interpreted it differently. Wei (2003) defends Levelt's model as accounting for an incomplete knowledge of a second language in that it:

> is accounted for by assuming that some of the second language lexical items are not yet fully specified in terms of the semantic, syntactic, and phonological information they contain, and the lack of automaticity is simply accounted for by assuming serial, step-by-step processing rather than parallel processing at the morphophonological and articulatory levels (Wei, 2003, p. 63).

Wei's argument assumes that the learner is vaguely aware of the unknown item; however, it is highly improbable that of the hundreds of thousands of words that exist in

any given language, a non-native speaker will have some degree of knowledge of any word selected at random, and even more so if the selected word is of mid-to-low-frequency.

De Bot (2004) revised Levelt's model under the assumption that the individual is the most important factor in the model-construction process, within whom all factors and influences combine. He seeks to design one model that accounts for all possible individual differences and an infinite number of languages. Paradoxically, his model is simpler than others (Grosjean 1992, Green 1986) that have been proposed; it is even simpler than the model on which it was based. While this model is not perfect either, as it is based on a model which was in turn based on empirical monolingual data, it is one of the most comprehensive and detailed models available (de Angelis, 2007).

In plain terms, it begins with an idea to be articulated and a target language, or "communicative intent + language" and ends with spoken or written output. In between is a complex and non-linear interaction between concepts, lemmas, lexemes, phonetics, and syntax (a.k.a., the mental lexicon, examined in further detail in the next section), centered on the target language but potentially mediated by other known languages. In a native speaker of English who is proficient in French and learning Spanish and attempting to express the previous example in Spanish, the thought process behind the output might look something like this:

> Source structure: Contrary to what is observable by the naked eye, the sky is not actually blue; but rather it is colorless and appears to be blue because of the manner in which the molecules in the sky scatter sunlight.

Contrairement à ce qui est observable à l'œil nu, le ciel n'est pas vraiment bleu; par contre il n'a pas de couleur mais il semble d'être bleu grâce à la manière dans laquelle les molécules dans le ciel dispersent la lumière du soleil. (French)

Speaker's thought process:

Things I know for sure: ciel (sky) in Spanish is cielo, blue is azul, soleil (sun) is sol, œil (eye) is ojo; avoir (to have) is tener, luz is light

Things I'm guessing: être will either be estar or ser; color is colore; molecules might be los moleculos but molecule is feminine in French so it's probably also feminine in Spanish, so las moleculas; often –er French verbs are –ar Spanish verbs, so disperser might become dispersar; observable/observable might be the same if I say it with a Spanish accent. grâce à literally translates to 'thanks to' so if I literally translate that to Spanish it might be close, gracias à. manière is feminine, so if I change the –e to an –a and remove the ` then it might work. vraiment is 'truth' plus the adjective-making suffix –ment, so maybe I can construct the Spanish in the same way—verdadmente ? No, that seems wrong. Veritablemente ? Maybe. Contrairement might be contramente, no, contrariamente, and then à ce qui probably become a lo qué, il semble and il paraît are synonyms, and il paraît is parece in Spanish. Par is a word in a Spanish—wait no, I'm thinking of para and that means something else. I'll simplify to 'pero.' I looked up 'nu' in a Spanish-French dictionary and got

> ‘desnudo,’ but that’s part of an idiomatic expression that may not exist in Spanish—dictionary says it doesn’t. Use ‘a simple vista’ instead.

De Bot has broken down the process by which an individual asks his/herself, “How do I say X in language-Y?” a question that is posed at some level, either consciously or unconsciously, regardless of the target language or the proficiency of the speaker. While less proficient speakers may be more aware of this process as it is happening, highly proficient speakers use the same process on a more automatic level. In the example above, the speaker first translated to French, even though Spanish was the target language. She did this because she is proficient enough in French that it comes automatically while Spanish takes effort. Putting the French down on paper helps get it out of the way so that she can focus on the Spanish. Additionally, when she needs to guess at a Spanish word, she has noticed she has had better luck in basing her guess on the French word rather than the English word. In this particular example, and likely due to the fact that the example was very difficult given her level of Spanish, she did not approach the sentence linearly, one word at a time, from left to right. Rather, she started with the words that she felt confident about, before progressing to words she was less certain about or was less certain of her ability to guess. She finished by consulting a dictionary for ‘naked/nu,’ and remembered the ‘the naked eye/à l’oeil nu’ was an idiomatic expression that may not translate, leading her to revise an earlier decision about ‘ojo.’ De Bot’s model, shown in Figure 2, accounts for this kind of nonlinear behavior, which is very normal in humans. Unlike the Levelt Model, de Bot’s model includes bi-directional arrows, a demonstration of the interplay between a selected feature and a previously-selected feature, wherein a speaker may revise an earlier

decision. It is a closer match to what actually happens, allowing the possibility to revise but without mandating revision.

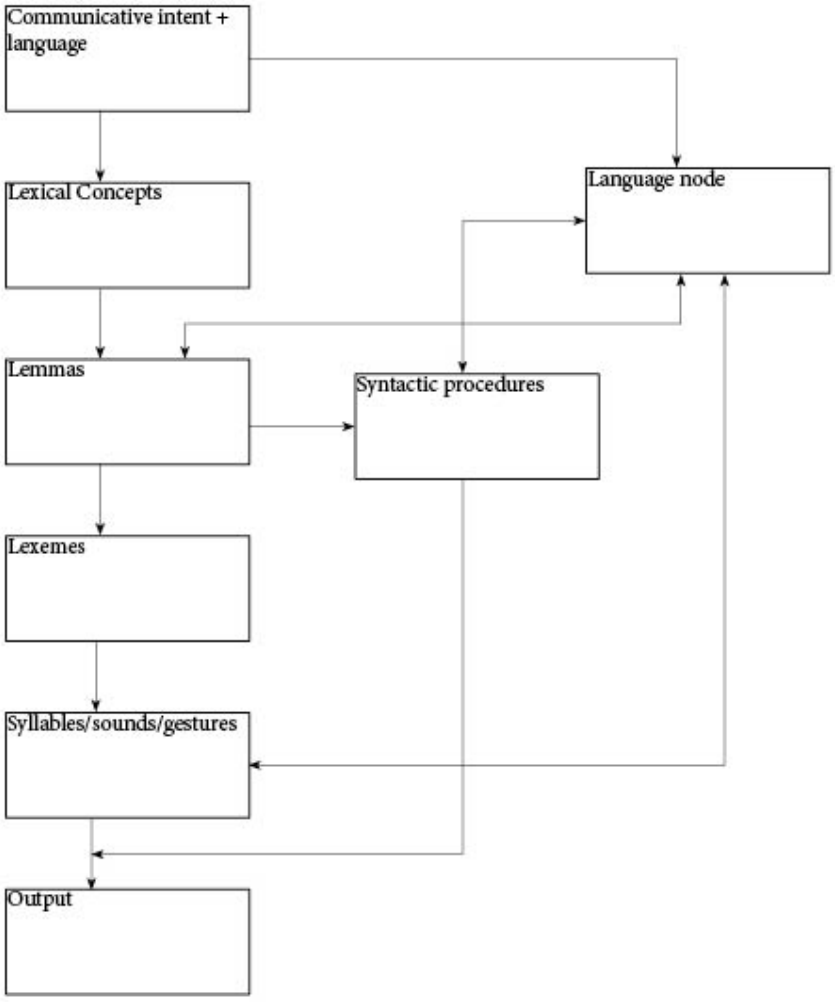

Figure 2: De Bot's Model of Multilingualism. Adapted from De Bot, 1992.

As de Bot illustrates, language production is not always a straightforward process. While it follows a general progression from the idea to be communicated to the output, in between is a complex and non-linear interplay between lexemes, grammatical knowledge, phonetic knowledge, and the speaker's known languages.

2.2 The Multilingual Lexicon

Since this study focuses on transfer at the lexical level, let's turn our attention to the Lemma/Lexeme levels within de Bot's model. The lemma refers to the concept, while the lemma-entry refers to the word and associated knowledge about the word. Within the lexicon, it is generally assumed that each lemma-entry is coded for language as well as patterns within the language (Wei, 2006). A lemma-entry will also include such information as the gender (if applicable), related words, neighboring words [words that differ by one letter: bot, cot, rot, etc.], restrictions as to what it can or cannot modify (if applicable), etc. Wei (2006) cites an example from Talmy (1985): "(English) *The bottle floated into the cave.* (Spanish) *La botella entró a la cuave* [sic] *flotando"* (p. 91) In this example, English conflates the action "floating" with motion; Spanish does not allow this conflation. The Spanish example directly translates to "The bottle entered in the cave floating;" floating is used as an adverb to describe how it entered, but it cannot communicate the idea of motion by itself. In a Spanish/English bilingual, this information is embedded in the lemma-entry. There is a separate lemma-entry for each language, but the two entries are connected and each entry contains language-specific information. In our above example, the Spanish lemma-entry might include the fact that *flotando* communicates manner but not motion, while the English entry for *floated* might include that fact that it communicates both manner and motion.

Herwig (2001) more fully fleshes out what information is contained in a lemma entry (Figure 3). The larger circles represent the dimensions of lexical knowledge: semantic quality, semantic valency, grammatical or morpho-syntactic specification, phonological layout, and orthographic layout (Herwig 2001). "The inner triangle

represents the *core entry* of the mental lexicon, i.e. a *basic form* (phonological and orthographic) associated with a semantic *core value* (basic meaning)" (Herwig 2001, p. 121, emphasis in the original). That inner triangle is the first to be filled in when a new word is learned: what it means, what it sounds like, how it is written. As an individual's knowledge of the word and the language as a whole grow, the central and outer spokes of the web are filled in: where can it fall in a sentence (morpho-syntactic specification), which words must it be paired with in order to make sense (semantic valency), what are its secondary/tertiary/metaphorical meanings (semantic quality), how does its relationship to other words affect its pronunciation or stress (phonological layout), how is the spelling adapted for other forms (i.e. verb conjugation, noun pluralization, nominalization of a verb) (orthographical layout).

If language-specific information is tagged—or labeled according to language membership—in the lexicon of these speakers, it must become tagged during the learning process. If, in successive multilinguals, the native language is tagged by default, then the first non-native language is not tagged as a specific NNL, because there is no need to. That speaker is only working with two languages; accordingly, the brain simplifies it to "NL" vs. "not-NL;" for a typical American, it would likely be simplified to "English" (NL) and "other" (the language being learned). This works efficiently unless and until one adds a second non-native language.

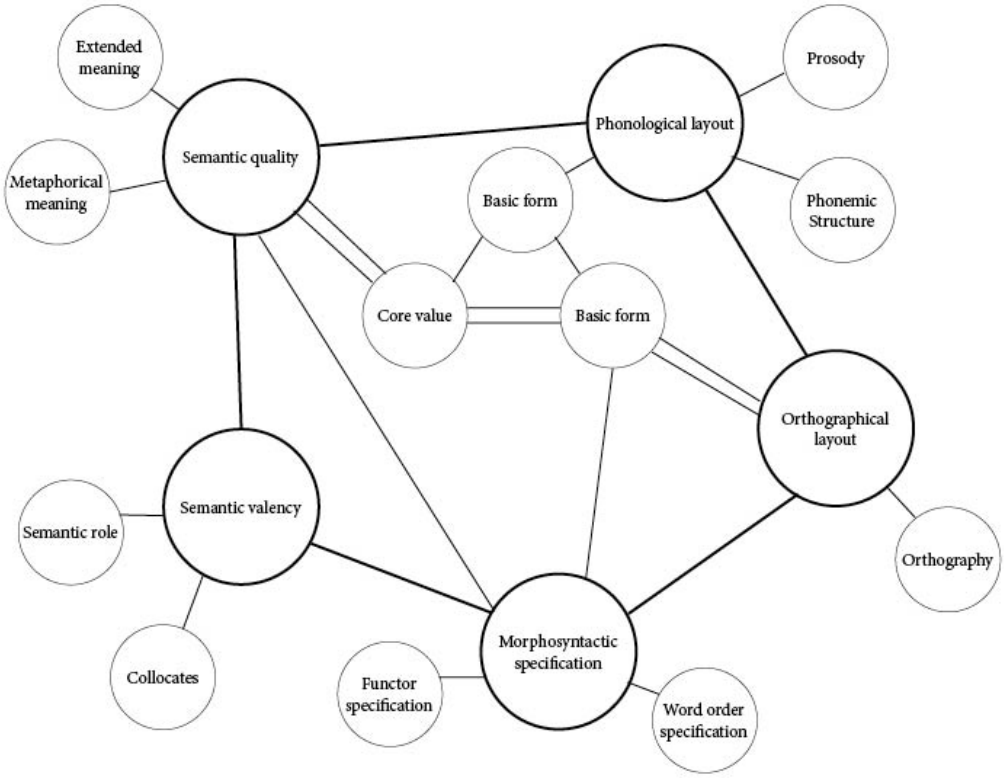

Figure 3: Herwig's Model of a lexical item. Adapted from Herwig, 2001.

Once there are two non-native languages, or two languages initially coded as "not-NL" or "other," it becomes challenging to know which word belongs to which non-native language. To give an example, in a native speaker of English learning both French and Spanish, French and Spanish would be tagged in the same way, as "other." It may be more challenging if the two non-native languages are more similar to each other, and less challenging if they are more different (Janus, personal communication). While the brain still conflates the two as "not-NL," it is easier to inhibit the non-target non-native language because of its greater degree of difference. For example, let's compare the French, Spanish, and German words for "book," thinking of a hypothetical developing learner of French, Spanish, and German. French: *livre* [livR], Spanish: *libro*

[libro], German: *buch* [bu:x]. The French and Spanish words only differ by two letters, /v/ and /b/ and the word-terminal vowels /e/ (although this "e" is mute) and /o/; furthermore, /v/ and /b/ are both voiced bilabial consonants, although /v/ is a fricative, while /b/ is plosive. This similarity makes sense when you consider that both words are derived from the Latin root "liber." Meanwhile, the German word is completely different in terms of orthography, phonetics, and etymology. The learner is likely to have more difficulty remembering which word is Spanish vs. French than making the same distinction between German and French or German and Spanish, despite the fact that they are all tagged in the mental lexicon as "not-NL."

This idea is supported by De Angelis' diary study of a native speaker of English simultaneously learning Spanish and Italian (2008, study 3), in which the participant writes:

> There seem to be different levels [of confusion]. The lowest level is the difference between the [Spanish] word *dinero* and [Italian] *soldi* [money]. Surprisingly I'm not rationally sure which belongs to which language, but when I speak I don't think I ever make mistakes with them. Then there are those million words that are quite similar. The problem is that here I knew the Italian when I lived in Italy because it sounded right. I never learnt it. Now there are two words that sound right. The word in Italian and the word in Spanish. My mind has the two words and I become frustrated because they are both 'right' i.e. I've heard people say both, but I don't know which is right in the language I want to speak. (Week 5; italic in the original). (De Angelis, 2008, pp. 9-10).

For this reason, De Angelis cautions linguists against assuming that the presence of a non-target word within an utterance indicates transfer, as it is difficult for an outside analyst to know if the learner is truly transferring the non-target word from the non-target language or if they are using the non-target word because they mistakenly believe it to belong to the target language system (2008). Confusion about language membership is not truly the same phenomenon as transfer, although the effect is the same.

A few weeks later, and after a short trip to Italy, the same diary study participant continues:

> I spoke well throughout my trip. Only occasionally people raise their eyebrows when I said a word that did not exist in Italian and that *I did not realise was Spanish* [. . .] It is horrible to be speaking with this sense of unease not knowing if 'x' really belongs to language 'y'. You go '*a tastoni* ' [intuitively] and you feel very claustrophobic. The moment when you realise that *mucho* is Spanish and *molto* [a lot] is Italian is, for me, the most important – it is one of liberation. (Week 10; italic in the original) (De Angelis, 2008, p. 10)

This supports not only the assertion that at lower proficiency levels, there is some confusion as far as language membership of a given lemma, but also that it is temporary and can be overcome (De Angelis, 2008; Hammarberg, 2001). These examples also illustrate that the lexicons for multiple languages are not independent from each other but are strongly interconnected. Confusing the Spanish and Italian words for the same item, as the participant did for *soldi* and *dinero,* is only possible when the speaker is aware that the two words share the same meaning, or otherwise have something in common, and are accordingly connected within the mental lexicon. Even if the two

words are not similar on the surface, as in the *libro/livre* example above, it is possible to confuse their language membership based on the shared meaning or other similarities, or a more general belief that the languages are similar.

Transfer occurs when there is a gap between what the subject wants to express and what they are capable of expressing (De Angelis & Selinker, 2001; Wei, 2006). They may turn to an equivalent term in another known language as a potential source: they may borrow the entire word, they may adapt the word to suit the target language, or they may invent something totally new. Furthermore, they may transfer the entire lemma, transferring elements of the lemma that are true in the source language but not in the target language. For example, in English, the verb "to wait" requires the preposition "for" when used with a direct object; in French, the corresponding verb "attendre" cannot take a preposition. English-speaking students of French often transfer the English lemma, saying "j'attends pour le bus" (I wait *for the bus) instead of "J'attends le bus" (I await the bus).

Singleton (2012) reports on two studies of trilingual English-Irish-French speakers conducted by Ó Laoire & Singleton (2009, 2006a, 2006b) in which participants needed to complete a linguistic task in French that would slightly surpass their vocabularies. All participants were teenagers learning French as an L3; they were either native speakers of English with extensive knowledge of Irish, or they were native speakers of both English and Irish. The three languages in question belong to different language families, but share a lexicon to some degree. English and Irish both derive some of their lexicon from romance languages, and from French in particular, although the French-influenced English lexicon is much greater than that of the Irish lexicon. All

participants chose English (as opposed to Irish) as the better source of approximations, demonstrating that they recognized the relatively small shared French-Irish lexicon compared to the relatively large French-English lexicon. This assertion was confirmed in the participants' commentaries on the task. Similarly, in Ringbom's (2001) studies of trilingual Finnish-Swedish-English speakers, Swedish was always the preferred source language for target language English, regardless of Swedish's L1 or L2 status. English and Swedish are both Germanic languages, while Finnish is not. In both of these studies, speakers favor a language they view to be more similar to the target language, while ignoring the language they perceive to be more different. At the same time, we cannot ignore De Angelis' (2008) insight questioning the assumption that all transfer present in the output is transfer, as the user may have believed the word(s) to belong to the target language. What is clear is that in both of the above cases, participants ignored the language perceived to be more different, suggesting that it is easier to separate the more different language from languages perceived to be more similar.

Apart from mixing languages at the word level, in a developing multilingual lexicon, the additional information stored with the lemmas can be mixed as well. Wei's 2003 study included an L2 speaker of Japanese with L3 English who wrote "When I'm sick, when I've cold I ***eat*** medicine, cold medicine" (p. 65) the learner extended the Japanese lemma, where medicine is a thing that is eaten, to English, instead of saying "to take medicine." Similarly, an L2 English user with L3 Japanese extended the English lemma "to have lunch" to Japanese, despite the fact that it does not work. Lunch cannot be had in Japanese; it must be eaten (Wei, 2003). When a speaker has knowledge of

collocations, they are part of the lemma; but in the language learner the lemma-entry is developing, as a result these collocations may not be firmly established.

Beyond this lemma-concept mixing, predicate-argument structures can be mixed as well. The same L2 Japanese speaker of L3 English as above wrote, "My brother also ***graduated*** New York University" (p. 66), using the Japanese structure that does not require the preposition *from* (Wei, 2003). It should be noted that this structure may be acceptable in British English; while it is unclear from the background provided if they had been taught British English or American English, it could be an issue of previous training. In a second example, the same student writes: "My English is not good, so I can't ***help*** my daughter's homework" (Wei, 2003, p. 66). To make the sentence grammatically correct in English, we would have to add either the preposition "with" or the auxiliary verb "do" in order to adequately communicate both the recipient (daughter) and the target (homework) of the help. In Japanese, the possessive "daughter's" already does this (Wei, 2003).

This section has examined the components of the mental lexicon and an individual lemma-entry, with special attention to the fact that knowledge of a word encompasses much more than the simple knowledge of the word's meaning. It encompasses pronunciation, spelling, semantic role, collocations, syntactical information, metaphorical and extended meanings, usage information, and language membership information. As these lemma-entries are language-specific and inter-connected, activation can spread from one lemma to a related lemma in another language, and more generally to the increased activation of that non-target language, which will be further discussed in the following section.

2.3 Language Activation

As has been demonstrated above, the lexicon is an interconnected web of knowledge that bridges a speaker's known languages. Furthermore, transfer demonstrates that languages are simultaneously activated, and not divorced from each other. Coming back to De Angelis' diary study participant, he could not mix Spanish and Italian if they were not both activated. All known languages are simultaneously activated, but to varying degrees (Proverbio, Roberto, & Alberto, 2007; Gabrys-Barker, 2008; Tullock & Fernández-Villanueva, 2013; Canagarajah & Wurr, 2011; Blumenfeld & Marian, 2013; Aparicio, X. & Lavaur, J., 2014; Marian et. al., 2012). Accordingly, processing of the non-native language cannot be divorced from processing of the native language (Cook, 1992). In trilinguals, it has been suggested that while their most proficient languages may be simultaneously activated, the less proficient language(s) is not necessarily significantly activated (van Hell & Dijkstra, 2002, in Marian et al 2012). Regardless of the L2/L3/Ln status of the target language, lexical searches seem to occur primarily in L1 (Gabrys-Barker, 2008; Tullock & Fernández-Villanueva, 2013).

Tullock & Fernández-Villanueva (2013) conducted an English composition think-aloud study in a German-immersion school in Spanish Catalonia; where Spanish and Catalan are both community languages with varying degrees of instructional support, German is the main language of instruction, English is introduced as the first foreign language, and French is introduced as the second foreign language. Of the 10 participants in the study, three had Spanish as a native language, three had Catalan, and the remaining four had German. They found that languages other than the target language were active during the task, and that the active languages were not limited to

L1. Eight participants thought primarily in Spanish, which included all native Catalan users and two of the native German users; meanwhile, only native Catalan speakers used Catalan at all. Only one participant used all of her known languages, while all but two participants used their L1 more frequently than their other languages. Of the outliers, one used Spanish more than her native Catalan while the other maintained a balance of German and Spanish. The authors attributed these differences to the participant's specific backgrounds. Most notably, 104 of the 111 lexical searches in the data involved at least one non-target language. Of those 104 searches, 81 involved two languages, 22 involved three, and 1 involved four. Of the 10 participants, seven used three or four languages in their searches. The authors ultimately concluded that multilingual writing is a multilingual event, in which the user draws on all known languages, activating all of them; daily contact and daily use will significantly impact the likelihood of a specific language to be activated (Tullock & Fernández-Villanueva, 2013). Based on the same study, it can also be argued that daily contact and use also significantly impact the degree to which a given language is activated.

As has been demonstrated, the fact that interference exists indicates that known non-target languages are co-activated with the target language; the degree to which a given language is activated depends at least in part on daily contact. At the same time, the results of this co-activation are not always present in the output; at times, the speaker realizes that the word that has come to mind is not the correct form in the target language. This is still interference; it is interference that has been successfully inhibited. However, that inhibitory control can be affected by other factors. Marian, Blumenfeld, Misrahi, Kania & Cordes (2012) conducted a multilingual Stroop test. In the original

Stroop test, monolingual participants were presented with flashcards on which the name of a color was printed in colored ink; the color of the ink may or may not match the meaning of the word. Participants were then asked to name the color of ink. The cognitive challenge of the task is to ignore or override the automatic stimulus (reading); the time required to respond is an indicator of the cognitive load. In this multilingual version, participants were shown flashcards of a color word written in one of the languages they speak; printed in a color of ink that may or may not match that of the word itself. The test was repeated with slightly different instructions: at times they were to name the color of the ink in the same language of the card, in a subsequent iteration they were asked to name the color of the ink in a specified language not matching the language of the card. These tests were repeated for all languages. In addition to the mismatch between the color of the ink and the word on the card, there were also testing the delay in response between the congruent or incongruent language conditions. For example, in one iteration the text was printed in German and participants were asked to respond in German; in another iteration, the text was in German and they were asked to respond in French. The researchers found that "the mismatch between stimulus [the language of the text] and response languages [the language in which participants were instructed to respond] resulted in greater interference when the response language was a lower-proficiency language;" in other words, participants were less successful in inhibiting non-target words when asked to respond in a language in which they were less proficient.

In Dewaele's (2001) comparison of formal [oral examination] and informal settings [office hour visits] and their influence on the fluency of French as an L2/L3, he

found that all subjects were capable of operating in a monolingual mode, thus exercising more cognitive control, and were more likely to do so in the formal setting rather than the informal setting. At the same time, overall fluency and accuracy was lower in the formal setting, suggesting that the increase in inhibitory control comes at a cost (Dewaele, 2001). This suggests that speakers make more of an effort in inhibiting interference in certain situations, implying that they exert some degree of control over the presence of interference in their output. It also suggests a value judgment; the speakers in this study have decided that it is more important to stay in the target language in the formal context than in the informal context.

2.4 Factors in selecting a source language

An underlying question in many studies of transfer (Aparicio & Javaur, 2014; Blumenfeld & Marian, 2013; Burton, 2010; De Angelis, 2005; Dewaele, 1998; Dijkstra, 2003; Gabrys-Barker, 2006; Goral, Levy, Obler et al, 2006; Halsband, 2006; Heidrick, 2006; Marian, Blumenfeld, Mizrahic et al, 2013; Tavés, Miralpeix & Celaya, 2005; Odlin & Jarvis, 2004; Rothman, 2004; Tullock & Fernández-Villanueva, 2013; Wei, 2003; Wei, 2006) is what determines the source language of transfer in the multilingual condition. The research is inconclusive, as the order in which a speaker acquires their languages (hereafter order of acquisition) and level of proficiency are two separate factors that are too often conflated, despite the fact that they are different and should be treated as such. While it is often true that one will be more proficient in an earlier-learned non-native language, it is not always true. For example, an individual may move to a country where their L3 is the dominant language, and then through daily use the L3 may replace the L2 as the dominant non-native language. Similarly, a person may start

an L3, find that they enjoy the L3 more than they enjoy the L2, and discontinue the L2. In time, the L3 proficiency will surpass the L2. The fact that most individuals who participate in studies on multilingualism are more proficient in their L2 than they are in their L3 has made these two factors difficult to separate. This distinction merits further study.

Looking at factors beyond dominance and order of acquisition, typological similarity, the actual or perceived degree of similarity between languages, may be an important factor in determining the source language (Rothman, 2010). In Rothman's study (2010) of adjective placement in the L3, comparing a group of Italian native speakers with English L2 learning L3 Spanish with a group of native English speakers with L2 Spanish learning L3 Brazilian Portuguese, neither order of acquisition nor proficiency was a significant factor in determining source language; rather the participants drew on languages they perceived to be more similar to the target language. However, in her study of the acquisition of English do-support in bilinguals and multilinguals, Pfenninger (2014) refutes the idea that transfer of the L2 into the L3 only occurs when the L2 is typologically closer to the L3 than the L3 is to the L1. Pfenninger's study (2014) included three groups of participants; in all three groups, the native language was either Swiss German or Standard German, the L2 was either Standard German or English, the L3 was either English or French, and the L4 (if applicable) was either French or English. In summary, all participants spoke Standard German, English and French; some also spoke Swiss German. She found that L2 was always the preferred transfer source over L1, adding support to the talk-foreign effect put forth by Selinker and Baumgartner-Cohen (1995). The talk-foreign effect can be

summarized as an assumption made by the speaker that the native language or anything that seems too close to the native language is wrong, even if the native language is more similar to the target language than another known, non-native language. This effect hypothesis that multilinguals judge their native language as an inappropriate source of transfer into non-native languages, due to the native status and regardless of any actual similarities between the native and non-native languages.

Language distance is another important factor. Cenoz (2001) found that Spanish was a stronger influence on L3 English than Basque, and this held for both groups: L1Spanish/L2Basque as well as L1Basque/L2Spanish. It is important to note that Basque is an isolate language, and thus is substantially more different from both English and Spanish than English and Spanish are in relation to each other. She also found fewer instances of transfer in younger learners than in older learners of similar proficiency, suggesting that age of acquisition may impact mental organization (Cenoz, 2001), which may in turn inhibit transfer. While the original study did not address the power dynamic, it is possible that the fact that English is viewed as a high-prestige language, while regional languages such as Basque have a history of being marginalized, may have influenced the participants' choice of source language as well.

In Hammarberg's (2001) longitudinal study of a native speaker of English with near-native competence in L2 German, having studied L3 French and L4 Italian (where L3 and L4 were both mostly dormant at the time of data collection) and currently faced with the task of learning L5 Swedish, he found that the majority of code-switches were overwhelmingly conducted in the L1, while lexical inventions were predominantly influenced by L2 German. This decision on the part of the learner, while it may not have

been made consciously, was likely influenced by a belief that Swedish is more similar to German than it is to English, although it cannot be dismissed that German's status as a non-native language may have also played a role.

Perhaps more important than actual similarity is the learner's perception of similarity (De Angelis & Selinker, 2001). Ringbom puts it quite simply, "wherever learners are able to perceive cross-linguistic similarities (and learners with the same L1 vary very greatly in this ability) they will make use of them" (2001, p. 66). As an example of this, Fouser (2001) compared two learners of Korean and Japanese, with English as their native language. The first, Jeff, had only ever learned Korean and Japanese; the second, Eric, had also learned French and German. When asked to comment on how their knowledge of other languages helped them to acquire Korean, they had different responses. Jeff:

> I found Korean grammar and Chinese loanword vocabulary very easy to learn, as in these aspects, it was remarkably similar to Japanese. Because of this, I would say that I learnt the basics of Korean in a much shorter period than had been required in learning Japanese—it was almost like just learning new words to substitute for the Japanese ones when building sentences. (p. 166)

For Jeff, his knowledge of Japanese was a significant help in building up the bones of his Korean. On the other hand, Eric's self-report was much shallower:

> I believe that the knowledge of the concept of keigo [honorifics] (relatively foreign to Western European languages) has also helped me to learn Korean. I found learning keigo much easier than its Japanese equivalent, though most Westerns seem to have problems with this. (p. 166)

I call this “shallow” because the only “honorific” system present in French and German is the existence of the second person formal and corresponding verb inflections, while Korean has an established and complex honorific system. I doubt the degree to which Eric’s knowledge of tu/vous or du/Sie would have been of much assistance in acquiring the Korean system, as the Korean system includes seven different levels of formality and corresponding verb morphemes as well as a less-direct style of discourse. In Cenoz’s study of the acquisition of English in a Spanish/Basque context, no participants drew on Basque, an isolate language, more than they drew on Spanish, an Indo-European language in their acquisition of English, another Indo-European language (2001). A perception of difference may eliminate a known language as a source language of transfer into the target language.

While three factors—dominance, order of acquisition, and degree of real or perceived difference or similarity—have been shown to play a role in the selection of the source language, the results of these studies vary and are ultimately inconclusive. Furthermore, the interplay between these factors has not been investigated.

2.5 Strategies

While it may not be possible to examine the effectiveness of one learning or communication strategy over another since learners tend to use multiple strategies simultaneously, researchers have examined the strategies that good language learners use. In their comprehensive literature review, Mollica and Nuessel (1997) reported on each study’s findings separately. Because the findings tend to overlap, I will summarize them in one list. According to the research summarized in Mollica and Neussel (1997), a good language learner:

1. Has a personal learning style or positive learning strategies (Stern, 1975, in Mollica and Nuessel, 1997; Cook, 1991, in Mollica and Nuessel).
2. Takes an active approach (Stern, 1975, in Mollica and Nuessel, 1997; Cook, 1991, in Mollica and Nuessel).
3. Has a tolerant and outgoing approach to the target language (Stern, 1975, in Mollica and Nuessel, 1997).
4. Knows of how to approach learning a language (Stern, 1975, in Mollica and Nuessel, 1997).
5. Uses approaches that encourage experimentation and planning, with the aim of developing the target language into an organized system and progressively revising that system (Stern, 1975, in Mollica and Nuessel, 1997).
6. Focuses on meaning (Stern, 1975, in Mollica and Nuessel, 1997; Rubin, 1975, in Mollica and Nuessel, 1997).
7. Is willing to practice (Stern, 1975, in Mollica and Nuessel, 1997; Rubin, 1975, in Mollica and Nuessel, 1997).
8. Is Willing to use the target language in real communication (Stern, 1975, in Mollica and Nuessel, 1997; Rubin, 1975, in Mollica and Nuessel, 1997).
9. Self-monitors (Stern, 1975, in Mollica and Nuessel, 1997; Rubin, 1975, in Mollica and Nuessel, 1997).
10. Develops the target language as a separate system and learning to think in it (Stern, 1975, in Mollica and Nuessel, 1997; Cook, 1991, in Mollica and Nuessel).

11. Is willing to guess, and tends to guess accurately (Rubin, 1975, in Mollica and Nuessel, 1997).
12. Is uninhibited. (Rubin, 1975, in Mollica and Nuessel, 1997);
13. Looks for patterns in the target language (Rubin, 1975, in Mollica and Nuessel, 1997).
14. Pays attention to the input provided by others (Rubin, 1975, in Mollica and Nuessel, 1997).
15. Develops awareness of language both as a system and as communication (Cook, 1991, in Mollica and Nuessel).
16. Pays attention to expanding their language (Cook, 1991, in Mollica and Nuessel).
17. Takes into account the demands of learning a language (Cook, 1991, in Mollica and Nuessel).

These strategies have not been examined in the light of how they may benefit someone learning or with knowledge of multiple languages.

2.6 Research Questions

While the existing research has examined how language might be constructed, stored, and transferred; when and why interference is likely to occur; factors that may affect inhibitory control; and what factors are involved in determining the source language, it is far from complete. It has not examined the interplay between the known factors in determining a source language, or how multilinguals view their own interference, or the more practical application of what a learner can do about it.

Personality factors, which may play into individual differences, have not been examined either. The present study attempts to address these questions:

1. How do multilinguals perceive their own interference?
2. What is the relationship between dominance, order of acquisition, and degree of similarity in determining the source language of transfer?
3. Are multilinguals aware of any strategies that they may use to diminish interference?

The next chapter will discuss the methods used in this study and describe the participants.

CHAPTER 3: METHODS

3.1 Introduction

In order to investigate these questions, adult multilinguals were surveyed on their linguistic backgrounds, their experiences with linguistic transfer, and their personality traits. Six weeks after the survey closed, follow-up interviews with interested participants were conducted in order to clarify certain unclear responses and to answer some questions that came to light after analyzing the data. Both the survey and interview data were analyzed to identify relationships between the participants' understanding of and experiences with transfer, their language profile, and their personality traits.

3. 2 Data Collection Method

First, a survey was devised to elicit a demographic profile (age, sex, nationality, education level), language profiles, information about the multilingual participants' experiences with linguistic interference, and their personality traits. The survey design was modeled in part after similar qualitative studies of multilingualism conducted by Dewaele & Li (2013, 2014), and supplemented by questions related specifically to the goals of this study.

Language profile. Participants were instructed to list the languages that they spoke or had studied, with the clarification to include any language they had ever studied or had any knowledge of. This was deliberately left open-ended, as one can potentially experience interference at any level of proficiency. For each non-native language, participants were asked to provide the age at which they began the language,

and the context in which it was acquired. Participants were also asked to self-assess their proficiency according to the schematic illustrated in Table 1:

Table 1: Proficiency Scale

Numerical rank	Label	Description Provided in Survey	Correspondence to ACTFL's Scale
1	Beginner	I know a few words or phrases	Novice Low
2	Basic	I can ask basic questions and understand the basics of the answer.	Novice Mid-Novice High
3	Intermediate	I can get by in daily and professional activities.	Intermediate Low-Intermediate High
4	Advanced	I can fully participate in daily and professional activities.	Advanced Low-Advanced High
5	Native-like	I can pass for a native speaker.	Superior-Distinguished

The self-assessment model was chosen so that participation could be as open as possible, rather than limited to those who had knowledge of any particular set of languages. It was feared that an assessment instrument would be inconsistent across languages, not available for all applicable languages, and/or difficult to incorporate seamlessly into the survey. The self-assessment model has been chosen in other qualitative multilingualism studies for similar reasons (Dewaele & Li, 2013, 2014). Alternatively, self-assessment according to the ACTFL proficiency scale and the Common European Framework of Reference for Languages was considered. However, it was decided that those scales were too complicated for non-linguists or non-language educators to understand. The above categories emerged as a simplification of the ACTFL proficiency scale (ACTFL, 2012).

Linguistic Transfer Experiences. These questions were designed to elicit information about each participant's experiences with interference: which languages are

affected, in what aspect of language, and in which communication mode; any tips they have figured out along the way, as well as any guidance they had been given on the subject. As researchers are just beginning to look at interference through this particular lens, there was little research to guide this portion of the survey. In the survey, participants were asked to give an overall ranking of the language skills (Speaking, Listening, Reading, & Writing) in which they experience interference from greatest to least. They were asked to do the same for linguistic structures: Grammar, Vocabulary, Syntax, and Pronunciation. For both of these questions, it was assumed that transfer occurs to some degree across all skills and structures because transfer has been documented across all skills and structures. Participants were then asked to indicate how frequently they experienced interference on a scale of 1-5 (1=rarely, 5=almost always). In the context of self-reported data, it was decided that general statements of frequency would be the most accurate method of eliciting information about the frequency of interference. In the next question, participants were asked to rate their level of frustration related to interference on a scale of 1-5 (1=not frustrating, 5=very frustrating), and had the opportunity to elaborate on their response in a free-response question. As the student who had initially inspired this project viewed his interference as frustrating, *frustration* was taken as the starting point. Participants were also asked to indicate, in their experience, which language interferes with which other language. The question was worded in such a way that if a language interfered at all with another language, they were to mark it; however, the way the response system was set up, participants were only able to select one source language per target language. This issue had not come up

in testing. Due to this limitation, this study cannot address why some languages do not interfere; it can only address the reported interference.

The survey also included several open-ended questions. Participants had the opportunity to comment on their frustration with interference, and the frequency in which it occurs. In another question, participants were asked to recount a time when they experienced interference. In another, they were asked to name any strategies they use to minimize or deal with interference. Finally, they were given the opportunity to add any information they found relevant that hadn't already been asked. See Appendix A for a full copy of the survey.

Once prepared, the survey was piloted by 5 individuals not otherwise affiliated with the project. No issues came to light.

The survey was distributed electronically through the FLTEACH email list-serv and through social media, in particular through the various Facebook pages of Concordia Language Villages, and participants were encouraged to share the survey through their own social media accounts as well. The survey was also distributed through two educator Facebook groups, FL Teach and French Teachers in the US. The latter group is almost exclusively French teachers, which may account for the over-representation of L2 French speaking participants compared to nation-wide statistics. Additionally, Concordia Language Villages emailed the survey to current and former summer staff members. The survey was optimized for mobile devices to ensure ease of use. Data was collected over a 10-week period (Oct 16-Jan 1, 2016).

The survey was conducted in English; accordingly, only those who felt they were sufficiently proficient in English to participate were able to do so.

3.3 Participants

Four hundred and fifty-seven participants began the survey, however of those 159 participants did not complete the survey; their responses were thus excluded from analysis. In total, 298 responses were analyzed.

Most of the participants (77.2%) self-reported as American, a culture in which knowledge of foreign languages, especially multiple languages, is not highly valued. However, because a majority of the participants were recruited from Concordia Language Villages and FLTEACH, this collective cultural non-value is unlikely to be shared by these participants. Still, this value may have influenced them in ways that affected their experiences with foreign languages differently than if they had grown up in a culture in which multilingualism was valued. Unfortunately, there is not enough data in this study to examine this potential point of difference: most participants report being American, the next largest group is European, while the value placed on multilingualism is greater in Europe than it is in America, the degree of it's importance is still debatable. Very few participants reported being from a place, such as Senegal, where it is normal to speak one or two regional languages with your family and in daily life as well as a third official language, with the expectation that one will also learn additional languages in school. This last example is an environment in which multilingualism is truly embraced; any study attempting to investigate the influence of cultural attitudes would have to include representatives from such a culture. Furthermore, 96.3% of participants reported having learned their languages additively. Simultaneous multilinguals may experience and handle interference differently than additive multilinguals, but that question is outside the scope of this particular study.

Table 2: Participant's Gender

	Male	Female	Other: Non-Binary	Prefer Not To Respond	Total
#	52	244	2	2	300
%	17.4%	81.9%	.7%	.7%	100.7%

In an effort to be inclusive without being exhaustive, participants were also presented with an *other: non-binary* option in describing their gender in addition to the traditional options (male, female, prefer not to respond); participants were also able to select as many as applied. As shown in Table 2, an overwhelming majority of respondents identified as female (244); only 52 identified as male, two identified as non-binary, and two people preferred not to respond. The total (300) exceeds the number of respondents (298) because two participants marked two options. One of these marked both “male” and “female” while the other marked both “female” and “other” but did not further specify when given the option. These responses were not recoded, as the respective participants know their own identities better than I do, and it is not of critical importance for the purposes of this study. The percentages in this chart were taken out of the total number of participants (298).

Table 3: Participant's Age at the Time the Survey Was Taken

Age Category	18-29	30-49	50-79	Total
#	111	163	24	298
%	37.29%	54.70%	8.05%	100%

As shown in Table 3, at the time the survey was taken participants ranged in age from 18-79. One hundred eleven participants were aged 18-29 (37.29%); 163 were 30-49 (54.70%), and 24 were 60-79 (8.105%).

As far as education, depicted in Table 4, 6 respondents selected “other” and specified their answer; these responses were recoded to best correspond to the existing

options. “ABD” and “masters plus 15 hours” were both recoded as “Masters.” “BA in UK,” “Bachelors,” and “in med school” were all recoded as “College.” Finally, “currently in college (sophomore year)” was recoded as “Some College.” As a whole, participants were well educated. No one had less than a high school education. The majority (80%) had at least some college, the category that includes current college students; nearly half (49.32%) had at least a Masters degree.

Table 4: Participant's Education

	High School	Professional Training/Some College	College/Some graduate	Masters/PhD/MD/JD	Total
#	8	49	92	147	298
%	2.7%	16.44%	30.87%	49.32%	100%

Most participants spoke English as their native language (244, 81.9%). Other native languages represented include Bulgarian, Danish, Dutch, French, German, Hungarian, Polish, Portuguese, Romanian, Russian, Spanish, and Swedish. Ten participants reported having two native languages. Those language pairs include: English & French, English & German, English & Portuguese, French & Arabic, Pulaar & Wolof, Spanish & English, Swedish & English, and Ukrainian & Russian. One participant reported having three native languages: English, Spanish, and Italian.

The participants’ non-native languages are represented in order of frequency in Table 5. All percentages are taken out of the number of participants (298); 73.8% of participants have studied French; 72.5% have studied Spanish, and so on. The fact that French has surpassed Spanish in this list can likely be attributed to the fact that one of the methods of distribution of the survey was through a professional social media group consisting almost exclusively of French teachers. Furthermore, the collective dominance

of French, Spanish, and German suggests that the three languages were widely available to all of these participants.

Table 5: Non-Native Language Distribution

Language	N	%	Language	N	%
French	220	73.8%	Armenian	1	0.3%
Spanish	216	72.5%	Attie	1	0.3%
German	136	45.6%	Bambara	1	0.3%
Italian	64	21.5%	Bashkir	1	0.3%
English	46	15.4%	Croatian	1	0.3%
Portuguese	41	10.4%	Dari	1	0.3%
Japanese	39	13.1%	Esperanto	1	0.3%
Russian	37	12.4%	Haitian Creole	1	0.3%
Latin	32	10.7%	Hausa	1	0.3%
Mandarin	25	8.4%	Ikinyarwanda	1	0.3%
Arabic	23	7.7%	Macedonian	1	0.3%
Norwegian	22	7.4%	Martinican Creole	1	0.3%
Swedish	21	7.0%	Moroccan Arabic	1	0.3%
ASL	16	5.4%	Nepali	1	0.3%
Greek (modern)	10	3.4%	Old Church Slavonic	1	0.3%
Korean	10	3.4%	Old French	1	0.3%
Turkish	9	3.0%	Old Norse	1	0.3%
Danish	8	2.7%	Ottoman	1	0.3%
Dutch	7	2.3%	Pashto	1	0.3%
Greek (ancient)	6	2.0%	Penn. Dutch	1	0.3%
Hebrew	6	2.0%	Serere	1	0.3%
Irish/Irish Gaelic	6	2.0%	Sesotho	1	0.3%
Wolof	6	2.0%	Shona	1	0.3%
Hindi	5	1.7%	Slovak	1	0.3%
Polish	5	1.7%	Tajik	1	0.3%
Icelandic	4	1.3%	Tatar	1	0.3%
Farsi	3	1.0%	Tongan	1	0.3%
Old English	3	1.0%	Twi	1	0.3%
Thai	3	1.0%	Uzbek	1	0.3%
Cantonese	2	0.7%	Valenciano	1	0.3%
Catalan	2	0.7%	West. Armenian	1	0.3%
Czech	2	0.7%	Zulu	1	0.3%
Hungarian	2	0.7%			
Ojibwe	2	0.7%			
Romanian	2	0.7%			
Swahili	2	0.7%			

Some initial responses were recoded for in the interest of consistency. Many of the people who said they spoke Chinese did not specify a dialect; these responses were assumed to mean Mandarin Chinese because it is the dialect most commonly taught as a foreign language. Participants who specified another Chinese dialect were coded according to the named dialect (i.e., Cantonese). Responses such as "ancient fucking greek," "Koiné Greek," "NT Greek," and "Homeric Greek" were all coded as Ancient Greek; while "Greek" was assumed to mean Modern Greek. As the majority of respondents were American, "Sign Language" was assumed to mean "American Sign Language" and coded accordingly. If the same participant listed two languages, they were assumed to be different. Examples of this include Farsi and Dari; Norwegian, Swedish, and Danish.

The participants' proficiency self-assessment was converted to a numerical score. Table 6 reflects the reported proficiency for all participants, where 5 is Native-Like and 1 is knowledge of a few words and/or phrases. For the group as a whole, the mean reported proficiency of the L2 was quite high, at 4. The mean proficiency dropped quite a bit for L3, coming in at 2.589 and continuing a downward trend for subsequent languages. While there is a general trend that those who speak more languages have a lower mean proficiency across their languages, that trend was not significant.

Table 6: Participant's Language Proficiency

	Total	Prof 5		Prof 4		Prof 3		Prof 2		Prof 1		Mean	St Dev
		n	%	n	%	n	%	n	%	n	%		
NNL1	298	104	34.9	130	43.6	32	10.7	24	8.1	8	2.7	4.0	1.0
NNL2	294	10	3.4	46	15.6	90	30.6	110	37.4	38	12.9	2.6	1.0
NNL3	206	5	2.4	15	7.3	43	20.9	83	40.3	60	29.1	2.1	1
NNL4	116	1	.9	8	6.9	12	10.3	42	36.2	53	45.7	1.8	.9
NNL5	63			2	3.2		12.7	28	44.4	25	39.7	1.8	.8
NNL6	41	1	2.4				7.3	14	34.1	23	56.1	1.6	.8
NNL7	22	1	4.5				9.1	8	36.4	11	50	1.7	1
NNL8	12							5	41.7	7	58.3	1.4	.5
NNL9	7							1	14.3	6	85.7	1.1	.4
NNL10	7							1	14.3	6	85.7	1.1	.4
NNL11	4									4	100	1	0
NNL12	3									3	100	1	0
NNL13	3							1	33.3	2	66.6	1.3	.6
NNL14	1									1	100	1	0
Total	1077	122	11.3	201	18.7	190	17.6	317	29.4	247	22.9	2.66	1.3

Table 7 displays the age at which each participant began each language. Most languages were begun in childhood (676, 63.83%), with 220 (20.77%) begun in childhood and 456 (43.05%) begun in adolescence. The ages at which languages were started drastically diminish after that group. Please note that these numbers exceed the total number of participants because it reflects the age at which each participant began each language that they speak; in two cases, respondents did not know when they started. When a participant indicated two ages at which one language was started (examples, “4-5,” “8,13”), the two ages were averaged together.

Table 7: Age at which language was begun

	n	%
Childhood (0-11)	220	20.77%
Adolescence (12-18)	456	43.05%
Adulthood (19-59)	381	35.98%
Unknown	2	0.18%
Total	1059	100%

A wide range of learning histories was represented: immigration, immersion, classroom, self-study, summer camp, study abroad; many participants indicated diverse combinations of these activities in their histories. For this reason, the histories themselves were not coded, as any attempts to code this information would have omitted more information than would be useful. There were two observable trends: those who were most proficient tended to have indicated a combination of several learning environments; and those who learned a language exclusively through self-study tended to be less proficient in that language.

In summary, the majority of participants were female and were highly educated. At the time the survey was taken, their ages ranged from 18-79. The ages at which they began each language varied widely, from infancy to late adulthood. The manner in which the languages were acquired also varied widely. Participants also varied widely in proficiency; some were highly proficient in all of their languages, some only had a very basic knowledge of their languages, but most were highly proficient in one or two of their non-native languages with some additional knowledge of another.

3.4 Data Analysis Method

While participants had been instructed to list their languages, they had not been instructed to list them in any particular order. As a result, the order they chose was inconsistent across participants. For some, the order mimicked either the order of acquisition or the order of proficiency (as the two did not always coincide), although at times there was no apparent order. Due to this inconsistency, when I refer to L2, L3, L4, or so on as a general category, I am referring to the way in which they were recorded in

the survey; it is not intended to indicate either order of acquisition or order of proficiency.

As the influence of language distance was under investigation as a factor in determining the source language, language distance was calculated using eLinguistics.net's computerized comparison generator, when available (Computerized Comparative Linguistics). This model compares a stable selection of 18 words chosen because they fit the following criteria:

1. They have existed with the same meaning for 5,000-10,000 years.
2. They have been semantically stable of the years—their meaning and usage have not shifted.
3. They have not been subject to borrowing, such as trade-related words might be.
4. They have not changed or eroded much over the years.

The user selects two languages for comparison, and the system compares the consonants within the lexical morphemes of those 36 words (18 from each language) and returns a numerical value 0-100, in which a perfect match equals 100. The point values are summed and then divided by 18; the value returned is then subtracted from 100. This value is the total genetic proximity score for those two languages. The key is shown in Table 8:

Table 8: Key: eLinguistics.net Degree of Proximity

Score	Degree of Relation	Point of Divergence	Example(s)
1-30	Highly related languages	Protolanguage between several centuries and 2000 years	English & Swedish (26.7)
30-50	Related languages	Protolanguages appx. 2000-4000 years	English & Icelandic (35)
50-70	Remotely related languages	Protolanguage appx. 4000-8000 years	English & Russian (56.8)
70-80	Very remotely related languages	Protolanguage older then 8000 years; high interference with chance resemblance	English & Tajik (73.6)
80-100	No recognizable relationship	Any apparent relationship is more likely attributed to chance than to common origin	English & Zulu (83.5)

This comparison is not perfect, as it only compares lexemes, not phonetics or grammar; however, it is the only model I have found that is available for free and for a wide range of languages. Additionally, no surprises emerged in compiling the comparison data. Comparisons were not available for all of the languages used in this study. Comparisons were unavailable for the following languages: Attie, Bambara, Bashkir, Catalan, Dari, Esperanto, Farsi, Haitian Creole, Hausa, Ikinyarwanda, Mandarin, Martinican Creole, Moroccan Arabic, Ojibwe, Old French, Ottoman, Serere, Sesotho, Shona, Tatar, Thai, Tongan, Twi, Valenciano, Western Armenian, and Wolof. Accordingly, these languages were excluded; however, for each participant, the number of instances in which a comparison was unavailable was recorded. The higher this number is, the less reliable the total language comparison is. Comparisons were available for two standard dialects of Norwegian: Nynorsk and Bokmål; however, no

participant who spoke Norwegian indicated a specific dialect. As Bokmål is more commonly taught as a foreign language, the Bokmål scores were used. See Appendix B for the full chart.

Text entry passages were analyzed question by question using an interpretivist approach, first using keyword analysis and then coded as themes emerged. Examples of recurrent themes include humor, circumlocution, and normalcy. A single response could receive multiple codes if those codes were applicable to the passage. The number of occurrences of those codes was then calculated and is reported in the following chapter.

Twenty of the survey participants also participated in individual follow up interviews. Nineteen these interviews were digitally recorded and transcribed by the researcher; technical difficulties prevented the last interview from being recorded. The interview transcripts were also analyzed with the interpretivist approach.

This chapter has described the contents of the survey as well as the backgrounds of the participants and how the results were analyzed. Please refer to the Appendix A for a complete copy of the survey. The next chapter will present and discuss the data.

CHAPTER 4: FINDINGS

Purpose

The purpose of this study is to examine how multilinguals experience interference, the ways in which it affects their languages and communication, their attitudes towards it, as well as to identify any strategies they may use to help them cope with it and personality traits that may be beneficial in managing it, in the hopes that this knowledge may be beneficial to budding multilinguals in dealing with their own interference. The previous chapter explained the methodology used to investigate these issues; this chapter will present and discuss the resulting data.

Participant Experiences with Interference

To begin, a majority (255, 85.57%) of participants indicated that they experienced linguistic interference at the time the survey was taken. Of those 43 participants who reported not experiencing interference at that time, 23 (53.49%) reported having experienced interference in the past, which means that 276 (92.62%) of the participants either experience interference presently or have in the past. Only 20 participants (6.71%) reported never experiencing interference. This supports the assertion that interference is a common language-learning/multilingual phenomenon.

Furthermore, it is not necessarily a permanent phenomenon, as 23 participants (7.7%) indicated that while they had experienced interference in the past, they did not do so at the time of the survey. Eighteen of those 23 participants responded to a follow-up question asking what they thought might account for that shift. The responses to this question are detailed in Table 9:

Table 9: Those who no longer experience interference

	n	% (out of 18)
Discontinued Use	10	43.4%
Increased Proficiency	7	30.4%
Rarely experienced	2	8.7%
Mutual Intelligibility	1	4.3%
Practice Switching	1	4.3%
Divergent Modes of Language	1	4.3%

Here, the percentages are taken out of the number of participants who responded to the follow-up question (n=18), which showed that 43.4% of the participants who no longer experienced interference attributed this to the fact that they had discontinued using or learning the language. Of the remaining participants who responded to the question, the majority indicated increased proficiency or the ability to code-switch with their interlocutors based on their comments:

> Participant 71: "It was so rare anyway; I simply can't think of a recent incident."
>
> Participant 159: "I learned how to seamlessly move from one language to another"
>
> Participant 114: "…it is rare and really only happens when I switch languages a lot like when I am with people who also speak English, French and Dutch. So it doesn't matter if it happens then as I can say whichever word I want in whichever language I want."

In this type of situation, if interference occurs it may go unnoticed both by the speaker and the interlocutor, as it does not inhibit communication. The remaining participant [140] indicated that since she primarily uses German in reading and Spanish in speaking, the two languages no longer interfered with each other due to their use in distinct modalities. From these comments, we may infer that interference in

multilinguals is a common phenomenon that may subside as proficiency increases. However, based on the qualitative comments of these 12 participants (2.4% of those surveyed), what they may have regarded as interference in the past may later have been considered code switching within a particular context.

Research Question 1: How do multilinguals perceive interference?

In order to answer how multilinguals perceive interference, it is important first to address the underlying question of when interference occurs. Accordingly, participants were asked about aspects of their experiences with interference, including the *communication modes* in which they noticed it most, the *Linguistic levels* in which they noticed it most, the *frequency* with which they noticed it, and the *level of frustration* they experienced when it occurred. This portion of the survey also included an open-response item in which participants were asked to share an example of a time when they experienced interference.

Communication Mode

To examine the occurrence of interference across communication modes, participants were asked to rank order the modalities by the amount of interference that they noticed in each (highest to lowest): speaking, writing, reading, and listening as is displayed in Table 10.

As can be seen, the multilingual participants reported experiencing interference most often in the productive modes with 95.47% of all participants experiencing it while *speaking* and 60.75% while *writing*. The participants ranked the receptive skills lower for interference, with reading ranked third by 50% of the participants and listening ranked fourth by 41.5%. While *reading* was clearly on the low end of the ranking with

Table 10: Ranking Interference by Communication mode

	Speaking		Writing		Reading		Listening	
	n	%	n	%	n	%	n	%
#1	253	95.47%	4	1.51%	2	.75%	6	2.26%
#2	5	1.89%	161	60.75%	16	6.04%	83	31.32%
#3	4	1.51%	63	23.77%	132	49.81%	66	24.91%
#4	3	1.13%	47	13.96%	115	43.40%	110	41.51%
Mean	1.1		2.5		3.4		3.1	

93% ranking it as third or fourth, *listening* showed a lower level of agreement among the participants, with approximately one third of the participants ranking it second, one quarter ranking it third, and two fifths ranking it fourth. From these data we can infer that multilinguals experience interference most readily when producing language, but also are more prone to this experience in oral contexts than in written. As summarized in Table 11, multilinguals are most aware of their interference in speaking (productive:oral/aural), followed by writing (productive:written), listening (receptive:oral/aural), and finally reading (receptive:written).

Table 11: Summary, Interference by Communication Mode

	Productive	**Receptive**
Oral/Aural	I ranked 1: 95.47% mean: 1.1	III ranked 2, 3 & 4: 97.74% mean: 3.1
Written	II ranked 2& 3: 84.52% mean: 2.5	IV ranked 3 & 4: 93.21% mean: 3.4

Linguistic Level

Beyond the modes of communication, interference manifests itself differently across linguistic levels. Participants were then asked to rank order the amount of interference they noticed in the following levels of language: vocabulary, syntax,

grammar, and pronunciation (as shown in Table 12). While the rank order was rather clear in the previous section, the responses to this question were more contradictory. Vocabulary was ranked highest, with 69% of participants putting it in first position and another 18% putting it in second, meaning most speakers believe their interference is primarily lexical in nature. Lexical interference is likely to significantly impact meaning and to interfere with communication, and so it is also more salient.

Over a third of participants placed *Syntax* in the third position (39.74%), but many also placed it in either second position (22.71%) or fourth position (25.76%). *Grammar* was similarly dispersed, with 28.82% of participants ranking it second, 34.93% ranking it third, and 32.31% ranking it fourth. This disagreement may be related to the perceived impact on meaning. Transfer or interference errors that impact meaning are more likely to be noticed than those that do not. Depending on the languages involved, grammar and syntax will have varying levels of impact on meaning. Mis-gendering a word is unlikely to impact meaning. However, in languages with flexible syntax that depend on case markers to clarify meaning, errors in case will have an impact on meaning.

More participants put *pronunciation* in the second position than any other element (69, 30.13%); however, more participants ranked *pronunciation* as fourth (87, 37.99%) than second. There are several possible interpretations for this result. As pronunciation is unlikely to negatively impact meaning, it may be noticed less than some of the other linguistic levels. Some speakers may decide that if pronunciation does not inhibit their ability to communicate, then it does not bother them. It may also be reflective of the importance placed on correct pronunciation, with those who believe

pronunciation to be important ranking it higher than those who do not. It could be because learners do not always notice the gap between the way they are pronouncing a word and the way it should be pronounced, so the learner-participant may think their pronunciation is more target-like than it actually is.

As this data was entirely self-reported, we must take into consideration the speaker's awareness of their own interference: one is aware when they cannot find a word; they may not be as aware of how their knowledge of their second language's grammar may influence their usage of their third language's grammar. For example, a speaker of both Spanish and German might say **Ich habe Milch gebeben*, without realizing that they took the Spanish verb *beber* (to drink) and applied a German pattern to it to form the present perfect tense (habe ge-verb-en), whereas the correct German form would be *Ich habe Milch getrunken* (I have drank milk). If a speaker believes "*beber/beben*" is German, they would be unaware that this is transfer or interference from Spanish.

Table 12: Interference Rankings, Aspect of language

	Vocabulary		**Pronunciation**		**Syntax**		**Grammar**	
	n	%	n	%		%	n	%
#1	158	69.00%	35	15.28%	7	11.79%	9	3.93%
#2	42	18.34%	69	30.13%	52	22.71%	66	28.82%
#3	20	8.73%	58	16.59%	91	39.74%	80	34.93%
#4	9	3.93%	87	37.99%	59	25.76%	74	32.31%
Mean	1.5		2.8		2.8		3	

Frequency of Interference

To estimate the frequency with which interference was noticed, participants were asked to report how often they experience interference by choosing an approximate statement: *rarely, sometimes, fairly often, frequently*, or *almost always*. This information

is shown in Figure 4. Most participants reported noticing interference rather infrequently (65.47%), divided between those who reported *sometimes* noticing interference (48.92%) and those who reported noticing it *rarely* (16.55%). About a quarter of participants (23.74%) selected the neutral response, *fairly often*, while the remaining 10.79% reported noticing interference *frequently*. No one reported *almost always* noticing interference. These data suggest that the frequency of interference varies from one person to another, although on the whole it seems to be noticed relatively infrequently.

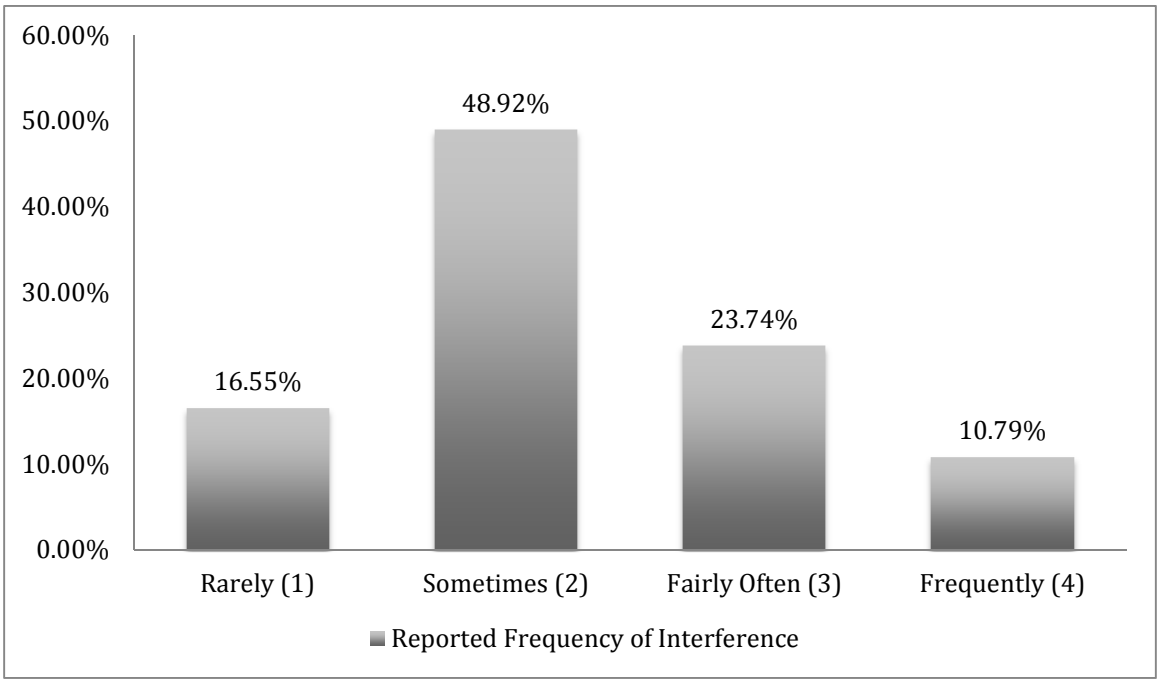

Figure 4: Reported Frequency of Interference

Frustration Level & Comments

While a phenomenon may be more frustrating when it is more frequent, the existence of the phenomenon itself can be frustrating regardless of its frequency. In order to ascertain how frustrating participants find interference, they were asked to rate

their degree of frustration on a scale of 1-5. It should be noted that the term "frustrating" is open to interpretation. An individual's connotation of the term may have influenced their rating. As reported in Figure 5, most (77%) reported some degree of frustration. While the degree of frustration varied, it was generally mild: 60.4% found their interference *somewhat frustrating*; 11.2% found it *frustrating* (without a modifier, the neutral response). An extreme minority (5.4%) found it more than neutrally frustrating: 3.6% reported it *very frustrating*, and the remaining 1.8% reported it *extremely frustrating*.

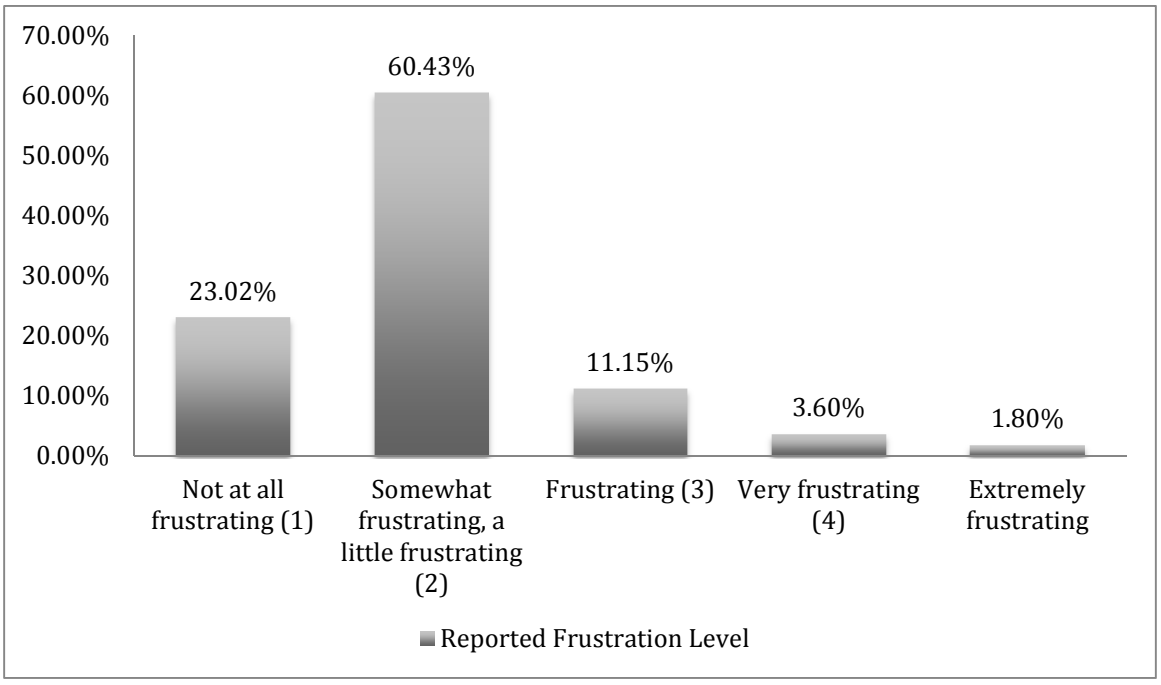

Figure 5: Reported Frustration Level

There was a positive correlation (r=0.35) between the frequency and frustration of interference. Additionally, there was a weak negative correlation (r=-0.14) between frustration and the maximum proficiency (an individual participant's highest reported proficiency) and a very weak negative correlation (r=-0.07) between the frustration and the mean proficiency (the sum of an individual participant's reported proficiency

divided by the number of languages they speak). This implies that as one becomes more proficient in any or all of their languages, they may find interference less frustrating.

To elicit more information about attitudes towards interference, participants were given the opportunity to elaborate on their response, which 66 participants did. A summary of those 66 responses is displayed in Table 5. Some comments spoke to multiple issues, and accordingly received multiple codes. The percentages in this chart where taken out of 66, the total number of commentators. The following text provides an overview of Table 13.

Table 13: Comments, related to frustration

Code	n	%
Humor	22	33.33%
Normal	13	19.69%
Benefit	10	15.15%
Proficiency	9	13.63%
Interlocutor	8	12.12%
Content/Context	5	7.57%
Interesting	5	7.57%
Detriment	4	6.06%
Challenge	2	3.03%
Strategies	2	3.03%
Modeling	2	3.03%
Total coded comments	82	124.24%
Total comments	66	100%

Many of the comments indicate positive attitudes towards interference:

Participant 1: “I find it amusing when Norwegian unintentionally comes out instead of English.”

Participant 38: “I find it humorous.”

Participant 46: “I am happy to be a polyglot and am philosophical about the mix up in languages.”

Participant 63: “I enjoy the interference. It sparks learning moments.”

Participant 106: “Mostly I find it humorous.”

Participant 138: “I also find it hilarious.”

One participant made a joke in their response, suggesting an especially humorous approach:

Participant 143: “The French and Germans have a lot of experience with invading each other so I figure it’s just natural. ;)”

However, the fact that the occurrence can be humorous does not negate the fact that it can also be frustrating. The two sentiments are not mutually exclusive:

Participant 199: “I find it comical when it happens but it drives me mad when I sit there trying to figure out the word I am looking for and I know how to say it in every language except one.”

Indeed several participants noticed that their experiences with interference had shifted over time and linked this shift to their proficiency. They often noted that it occurred more frequently at the beginning stages of a language, and lessened as they grew in proficiency (participants 183, 269, 280). This lends support to the weak negative correlation between higher proficiency observed earlier. However, it could be due to the fact that over time, the participants simply grew accustomed to it and either notice it less or came to view it as intentional code-switching or code-mixing.

As discussed above in relation to the linguistic levels, the frustration may be related to meaning, or to an individual's tolerance of his or her own mistakes. If the presence of a non-target structure within an utterance does not negatively impact the meaning, the speaker may find it less frustrating. Similarly if it is more important to a speaker that they are understood than that they speak with native-like accuracy, the presence of any kind of mistake, including the use of non-target artifacts, is less likely to frustrate them. The 20 participants who partook in follow-up interviews were asked to describe their general attitude toward making mistakes in a language. Sixteen either were not concerned at all with making mistakes, or were only concerned when the error interfered with their ability to communicate. Only four indicated they were embarrassed or afraid of making mistakes. It may be that multilinguals are less bothered by mistakes that do not impact meaning, although further research is needed.

For some, it may not be the perceived mistake itself so much as the perceived negative judgments of the interlocutor as a result of the mistake, coded *interlocutor* in Table 5, impacted their views of their own interference:

> Participant 6: "It is only frustrating when I get weird looks from Italian-speakers for accidentally saying a French word or phrase when I meant to speak Italian. Then I have to repeat myself in Italian."
>
> Participant 13: "With the German/Russian thing it's a bit more frustrating because I'll start a sentence thinking that I know how to communicate an idea and by the time I get to the end of it I realize that unless my interlocutor speaks both, I'm in trouble."

Participant 198: “My friends just tease me when it happens but it’s frustrating when it happens around strangers because I sound like a pretentious ass hat.”

Participant 217: “Most of the time I am not speaking with someone who would understand if I simply used the word that is in my mind. It creates a large pause in the conversation while I employ circumlocution or snap my fingers to think of the word. At times I can find the word right away, but not before letting out a sound like a stutter or ‘uh’ that makes me self-conscious.”

Participant 276: “The Spanish->German interference is a little frustrating, but mainly just embarrassing in class when a Spanish word just pops out of my mouth and surprises everyone.”

Participant 297: “It is frustrating to speak to my Spanish students or teaching colleagues in Persian-Dari, though I usually catch myself immediately.”

Participant 299: “People often think I’m faking not remembering my native language, and thus bragging somehow (Oh, I’m so fluent I forgot English!) but it’s really frustrating when the language I should know best is not forthcoming.”

In these examples, participants recounted how they thought others had perceived their interference. However, aside from signals that the intended message had not been received, these perceptions are just that: perceptions made by the speaker of how the speaker thought or feared the interlocutor judged the same speaker. This reflects more on the speaker than on the interlocutor. There is no verification that the interlocutor

judged the speaker in this negative light; these presumptions may not be accurate. A more reliable interpretation may be that the speaker is embarrassed to make these kinds of mistakes in public, particularly if that interlocutor does not also occasionally do the same thing.

Another participant acknowledged that their perception of interference is influenced by the context in which they use their languages: "Since I don't communicate in a language other than English for any serious purpose, it's more humorous when I experience interference" [137]. This participant's native language was English and her proficiency in her non-native languages was rather low (Spanish, French; both 2), and she reported that she didn't use either extensively at the time the survey was taken. She reported that when she does use them, she is usually speaking to children: helping Spanish-speaking elementary students with their homework, or when children ask her how to say something in French. The stakes here are likely lower than if she were speaking with adult native speakers or in a more professional context.

Several participants indicated that they find interference normal (6, 9%), and it does not bother them:

> Participant 110: "I see this as normal and I work on it, but it doesn't frustrate me."
>
> Participant 31: "It's not usually a big deal. On rare occasions it's annoying."

Other participants indicated that their level of frustration was linked to the content of what they were trying to express or the context in which they were working:

Participant 10: "The level of frustration increases with the complexity of the idea I want to convey."

Participant 269: "It was frustrating as a beginning French learner (proficient in two other languages) to want to communicate complex thoughts and find myself unable to recall even simple words."

Participant 180: "I only find it frustrating if the current situation demands that I be able to speak quickly and to accomplish an immediate goal."

For participant 269, what she found frustrating was that she was not equally proficient in all of her languages; that could communicate at a high level in her other non-native languages while struggling to communicate even basic ideas and phrases in French. For participant 180, it was the fact that she was not sufficiently proficient to operate as quickly as the situation demanded. The central theme behind these comments is that the participants noticed a difference between their expectations of themselves in the given situation and their abilities in the target language.

Some participants whose comments identified them as language teachers included perspectives on implications for the classroom. Two such participants saw value in modeling their interference to their students:

Participant 24: "I also find it helpful in my teaching—my Spanish-speaking students don't realize that interference is a normal part of language learning, so when their teacher experiences it right in front of them, it makes them feel more comfortable."

Participant 57: “I use it as a learning experience for my students and like to pull out my French-Spanish dictionary. The interference is natural because the languages are so similar.”

However, another two teacher-participants seemed to hold much more negative views:

Participant 42: “To me it makes me feel like I am not strong in either language and doubt I should be teaching at all.”

Participant 46: “I think the interference of Catalan in my Spanish will prevent me from teaching Spanish despite my certification. I am more comfortable reading Spanish, but speaking Catalan.”

While the first two teacher-participants seem to view interference as normal and turn the occurrence into teachable moments, the latter two teacher-participants seem to view it so negatively that it causes them to doubt their skills.

On the whole, speakers were most aware of their interference when conversing with others and perceived it to mostly affect vocabulary. At the same time, for most participants it was an occasional or rare phenomenon, and they did not seem to be very frustrated by it. Most were not especially concerned with interference, viewing it in a neutral or positive light; some were only concerned about it when it interfered with their ability to communicate or when they believed their interlocutor was judging them negatively.

Research Question 2: What determines the source language of interference?

To address the second research question, participants were asked to select which non-native language interferes with which other non-native language; however, they were limited to selecting a maximum of one source language of interference for each language that they speak. As mentioned in chapter 3, due to this limitation in the survey design the present study cannot address why some languages do not interfere with other languages; it can only address the interference that was reported.

Based on responses to each participant's language profile questions, those language pairs were then analyzed based on their strength relative to one another and the order in which they were acquired. In the tables below, "i" stands for the language that is interfering, "t" refers to the target language. The total number, 608, used in Tables 14, 15 and 16 exceeds the number of participants because it reflects the total number of language pairs for which participants reported interference. It should also be reiterated that as no proficiency threshold was set in taking the survey, it cannot be assumed that respondents were highly proficient or relatively balanced in their proficiency.

Table 14: The Effect of Dominance in Determining Source Language

	n	%
i is dominant	369	60.69%
i and t are of equal proficiency	83	13.65%
i is weaker, t is dominant	156	25.66%
Total	608	100%

Looking only at dominance in Table 14, it is clear that the stronger language was more likely to be the source of interference, although it was not impossible for a weaker language to interfere with a stronger language. Ignoring the cases in which languages –i

and –t were of equal proficiency, the odds that a stronger language would interfere with a weaker language were roughly 75%.

Table 15: The Effect of Order of Acquisition in Determining Source Language

	n	%
i was started first	382	62.83%
i and t were started at the same time	9	1.48%
t was started first, i was started more recently	217	35.69%
	608	100%

Turning to the next potential factor, the order in which languages were acquired as illustrated in Table 15, the language started earlier was more likely to be the source of interference. Ignoring the condition in which languages –i and –t were started at the same time, the odds of the language started first interfering with a language begun later were roughly 66%.

Either of these factors in isolation paints only a partial picture. As argued in Chapter 2, the language begun earlier is not always the stronger language; these factors must be considered independently of one another, as in Table 16. The stronger language that had been started earlier was the interfering language 51% of the time. Second to that, in 20.1% of the cases, the interfering language was weaker and had been started later (hence more recently) than the target language. After those two conditions, which are exact opposites, no other condition exceeded 10%. In 9.2% of language pairs, the language-i was stronger and had been started after language-t; but the opposite was true in 5.4% of pairs, where language-i was weaker and had been started earlier. There were no differences within the *balanced proficiency* category between the *language-i started earlier* or *later* conditions. The number of pairs satisfying the *language-i stronger, started at the same time as language-t; balanced proficiency, started at same time*; and *language-i weaker, started at the same time* conditions are too small to analyze. Key

takeaways from this table are that the stronger language is more likely to be the source language regardless of the order in which the languages were acquired, but there is also support for the recency effect observed by Cenoz (2001), where the more recently learned non-native language may be the source of interference or transfer, even in the case of an existing stronger non-native target-language.

Table 16: The Relationship Between Dominance and Order of Acquisition

	n	%
i stronger and earlier	310	50.99%
i weaker, started later	122	20.07%
i stronger, started after t	56	9.21%
balanced proficiency, i started earlier	39	6.41%
balanced proficiency, i started later	39	6.41%
i weaker, started earlier	33	5.43%
balanced proficiency, started at same time	5	0.82%
i stronger, started at same time as t	3	0.49%
i weaker, started at same time	1	0.16%
Total	608	100%

The third factor taken into consideration was the degree of difference or similarity between the language pairs. To determine the significance of the degree of difference between the language-i and language-t, the degree of difference was grouped by category, according to the author's key. The number of languages in each condition was then tabulated; as shown in Table 17, organized first by dominance, then by the order of acquisition (see Appendix C for the full table). In this table, language pairs for which no comparison was available have been eliminated, so the total number of pairs examined is lower than in the previous three tables. Across all conditions, minimal interference was reported between languages that had no relation or that were very remotely similar. A slight increase was seen in the *remotely similar* category; followed by a significant increase in the *similar* category, and symmetrical decrease in the *very*

similar category. While it is tempting to compare these data to the language pairs in which interference was not reported, doing so would be inherently flawed. As participants were not able to select all language pairs in which they experience interference, it cannot be ascertained that any unselected language pairs do not interfere.

Table 17: Integrating dominance, order, and difference

	no relation		**very remotely similar**		**remotely similar**		**similar**		**very similar**		**Total**
Examples	Spanish & Finnish Norwegian & Japanese German & Korean		Spanish & Arabic Norwegian & Irish German & Hungarian		Spanish & English Norwegian & Russian German & French		Spanish & French Norwegian & Dutch German & English		Spanish & Italian Norwegian & Swedish German & Dutch		
Organized by dominance											53
i stronger, total	31	9.31	20	6.01	84	25.23	130	39.04	68	20.42	333
balanced, total	5	6.49	3	3.90	13	16.88	41	53.25	15	19.48	77
i weaker, total	15	10.49	11	7.69	33	23.08	64	44.76	20	14.29	143
Organized by order in which they were acquired											553
i earlier, total	32	9.36	22	6.43	82	23.98	138	40.35	68	19.88	342
same, total						5.56	14	77.78	3	16.67	18
i later, total	19	9.84	12	6.22	47	24.35	83	43.01	32	16.58	193

As it is unlikely for an adult to begin two non-native languages simultaneously, too few language-i/language-t pairs satisfied the *same time* condition for those results to have any importance. Across all conditions, those language pairs in the *similar* category—similar, but not too similar—interfered most frequently. Languages pairs in this category include French & Spanish, Dutch & Norwegian, and English & German. There was a decrease of reported interference in the *very similar* category, which includes German & Dutch, Spanish & Italian, and Norwegian & Swedish. This may be because the *very similar* languages are so closely related that when interference does occur in an utterance, the speaker may not notice it, as these data are derived exclusively

from self-reports. In some, but not all of these cases, the two languages may be mutually intelligible, in which case any interference that occurs does not inhibit communication. Alternatively, it may be because the existing differences are small enough and few enough that the learner is better able to keep track of them. As languages become more different, it may become easier to tell them apart because those differences become more apparent.

In summary, while any language has the potential to interfere with any other language, a similar, stronger, and more firmly established is more likely to be the source of interference. While these data represent a summary of information compiled from 298 participants and 608 language pairs, it may not be reliable when applied to the individual learner.

Research Question 3: Are multilinguals aware of any strategies that they may use to diminish interference?

In order to address the fourth research question, participants were asked if they used any strategies to help minimize negative interference. For a participant to be able to answer the question, they needed to have some conscious level of awareness of what they did as well as their reason(s) for doing it. For the most part, multilinguals do not seem to be aware of doing anything to diminish interference. As shown in Table 18, only 41 participants (13.8%) reported being aware of using any kind of strategy to deal with interference. The comments were quite diverse considering the small sample size, but there are still some commonalities.

Table 18: Strategies used to manage interference

	n
Study	9
Focus	8
Resources	6
Compartmentalization/Identity	4
Receptive Transition	5
Slow Down	4
Communication Strategies	3
Connections between NNLs	3
Avoidance/Discontinuance	2
Calm	2
Memory: Visualization, Space	2
Self-Talk	3
Total codes	50
Total respondents	40

Nine out of the 40 participant's responses included *study* in some capacity; four of those responses specified *studying vocabulary*, which was deemed sufficiently significant to merit its own category. This intuitively makes sense; as the reported interference has been primarily lexical in nature, it is logical to focus on the vocabulary.

Another seven participants comments suggested that they gave additional *attention or focus* while experiencing interference or when they expected to experience interference:

> Participant 87: "Focus on target language."
>
> Participant 124: "Thinking about where I am, to whom I am speaking, the origin of the thing I'm thinking/speaking of to figure out the correct pronunciation."
>
> Participant 198: "In French class I refuse to think about Chinese at all or else I'll mix up vocab words."

Participant 198: “I think who is in front of me and try to remember the place I am at/in.”

Participant 102: “I try to get my mind back into French-mode or Spanish-mode. I do this by getting back to the ‘feel’ of French or Spanish”

Participant 242: “Take my time and think.”

All of these comments suggest paying particular attention to the social context of the situation or on the attributes of the target language. The last comment, from participant 242, was also coded as *slow down*, which had four comments. Slowing down may also be beneficial because it allows additional time to filter out the artifact from the non-target language. If this is the case, the interference may still occur in that it is present in the mind of the speaker, but it may not be present in the output.

Six participants indicated consulting resources such as a dictionary, either hard copy or online, or a translation service such as Google Translate. This may be an option when the user is aware of the gap in their own lexicon of the target language, instead of trying to guess at or invent an approximate word. It may be less likely to be used in situations where the user is confused as to the language membership of a given word; if they believe the word to belong to the target language, they may be less likely to verify it by looking it up in the dictionary.

Five participants indicated making an effort to compartmentalize:

Participant 143: “I visualize a border between the French-speaking part of my brain and the German-speaking part of my brain, and “shoo” words that are crossing over back where they belong.”

Participant 261: “I switch to my French brain if I need to speak French. I taught French for many years, and about an hour before class, I would cease to think in English and think only in French. This was great for class, but I would find myself responding in French to English questions from people who only speak English.”

Participant 278: “One is that I have to ‘block out’ the language I’m speaking from the other language I’m listening to in my head. 30 years ago, and still today, I can speak to someone in Spanish and then turn and speak to someone else next to me and speak in German—and the accents stay in their proper language place. Part of it is the fluency, I know. And then I can turn around and speak in English to someone else.”

Participant 280: “With Norwegian, when it starts to sound Swedish, I think ‘crisper/cleaner vowels,’ move faster, and over stress the important words. Also, lean down in pitch at the end of declarative sentences. It takes a few minutes, but it usually comes back to me. When going to Swedish, I honestly just start thinking about chewing my vowels and add a little ‘valley girl’ pretentiousness, and it usually starts to come out right.”

These responses show a high degree of metalinguistic awareness in the participant. With the exception of participant 143, these users were quite proficient in at least one of their non-native languages (4 or higher), which suggests that a certain amount of proficiency is involved in the ability to distinguish between non-native languages, although it may not be necessary to be equally proficient in all languages.

Interpreted another way, these comments could also speak to tapping into variations on one's identity. To take Participant 280 as an example, he seems to approach his language switches almost as if preparing for a role.

Another five participants indicated using some kind of receptive transition time. When they know they will be speaking another language, for example, before a language class, they will read or listen to input in what will be that language ahead of time:

> Participant 9: "I try to read in the language I am intending to be speaking in and listen to other people talking in that language. I try to refrain from speaking in Spanish immediately before I know I will be speaking in Italian and that helps."
>
> Participant 158: "Usually it helps before I'm going to be speaking a language to listen to an audio track (whether it be music, an audiobook, a podcast, etc.) prior to speaking the language. I liked to do this when I would get up in the morning while living in Japan, but I still do it before I got to Japanese class at my University."
>
> Participant 221: "I used to teach both Spanish and French. I would put on music in the language that I wanted to speak. So for example, as my Spanish class ended, I would turn on French music before my French students came into the room."
>
> Participant 268: "READING!!! If I know that I will be speaking Portuguese I often will read a little from an online newspaper beforehand."

> Participant 273: "Listening to people talking or music in the target language before performing a task in that language. Alternatively, just making up sentences in that language to say to myself helps my brain 'stick' in the right language."

This strategy might be particularly interesting for future study. As all known languages are simultaneously activated but to varying degrees (de Bot, 2004; Ludy & Py, 2009; Proverbio, Roberta, & Alberto, 2007; Burton, 2013), this receptive transition time might serve to amplify the activation level of the soon-to-be target language, essentially priming the brain to work in or with that language.

Three participants reported using communication strategies; two indicated that they try to plan out what they are going to say in advance, so that they can figure out how to say it in the desired language and look up any unknown words. The third reported circumlocuting until the intended meaning was understood. These participants seem to focus their attention on communicating, either by determining in advance how to convey the intended message so that they can figure out what gaps exist and how they might be bridged before speaking, while the latter essentially does the same thing but without planning it in advance.

While previous comments have insisted on keeping languages separate, three other participants indicated drawing connections between their non-native languages. One such participant reported looking for patterns between Spanish and French cognates, with special attention to exceptions; another reported keeping a vocabulary journal tying together words from his L3 with their L2 equivalents. The third reports using a rather involved translation process:

> Participant 257: I translate back into English [L2] whatever I want to say in French [L3] when I sense that English is interfering with my French. If the translation matches 100%, I translate the [French] utterance in Romanian [L1] (which is closer to French) to double check.

These participants draw on the relationships between their languages to facilitate their language use, suggesting that they view transfer as more facilitative or constructive than obtrusive.

The remaining themes had three or fewer instances. In *Self-Talk*, three respondents indicated talking to themselves in the target language to get started, even if it's just a few simple, beginner phrases. Two other participants' responses reported quite simply staying calm, and not allowing themselves to get flustered. One participant reported using an avoidance strategy, "talk less" (participant 122), while another reported having discontinued a language; these responses were coded as *avoidance/discontinuance.* While in the long run, these strategies may not be the most effective if one's goal is to become a proficient multilingual, not everyone shares that goal. Under *Memory,* one participant reported finding walking to another part of the room to be helpful, as if her memory is somehow linked to movement and space, and by changing space she is activating another part of her memory. The other responses coded as *Memory* talked about visualization; specifically, visualizing situations in which the target language vocabulary item had been used in the past.

While a variety of strategies have been reported, they can be divided into three categories: the metacognitive (study, using resources, making connections between non-native languages, compartmentalizing), production strategies (Tarone, 1980) (talking to

oneself, listening, and/or reading in the target language (receptive transition), and communication strategies (Tarone, 1980) (focusing, staying calm, using communication strategies, slowing down, drawing on one's memory). While further study is needed, not all of these suggestions are testable. Furthermore, it may be subject to individual differences (Griffiths, 2008); what works well for one person may not work at all for another. Therefore, at this point, these strategies should be taken as possible suggestions for future research or for an individual to test for oneself, not as concrete facts.

Implications

Some multilinguals have developed and are aware of strategies that they use to minimize interference. These strategies may prove beneficial to learners beginning their 3rd language who may be experiencing this for the first time, at least until they become sufficiently proficient that it becomes less of an issue. Those suggestions can be divided into three categories: cognitive strategies, production strategies and communication strategies. While these suggestions have yet to be studied specifically, they are ideas for further research as well as suggestions that interested parties may act on of their own accord, as the strategies suggested present no greater risk than that encountered in daily life. The presentation of the implications is best divided between implications for the student and those for the teacher.

Implications for the student

Cognitive Strategies. To begin with cognitive strategies, participants in this study indicated it may be beneficial to study, and/or to study with an emphasis on vocabulary (Griffiths, 2008). Others suggested using dictionaries or similar resources to look up problematic words (Griffiths, 2008). At the same time, it is likely that anything that

increases one's proficiency in a language will also help to lessen the frequency of interference from other languages (Cenoz, 2001; Hammarberg, 2001). Some report trying to make connections between their non-native languages, while others take the opposite approach and attempt to compartmentalize them. While the former is better supported by current research (Cook, 1992; Grosjean, 1982), neither approach has been investigated in terms of testing the ability to control transfer. The separatist versus connectivist approach may be subject to individual differences.

Production Strategies. Continuing with preparatory strategies, participants suggested that it may be helpful to engage in a receptive transition prior to class, or another situation that involves a language switch, such as: to listen to music in the target language, watch a video in the target language, to read in the target language, or even to talk to oneself in the target language (Kayaoglu, 2013; Griffiths, 2008). This gives the individual time to mentally switch gears, or start switching gears, before one is expected to produce language in the presence of others. Again, further research is necessary in order to determine if this is actually beneficial, to what degree, and if one method (reading, listening, self-talk) of transition is more effective than another.

Communication Strategies. The previous two types of strategies have addressed things that can be done in advance, either directly in advance of a switch or more general, ongoing study habits. A different set of strategies may be required for engaging in spontaneous conversation. In the moment, it may be helpful to stay calm and focused, to slow down, to try to think of the context in which the missing word was learned or used in the target language. Alternatively, the interference issue can be bypassed by

focusing on communicating the idea despite the missing word via circumlocution and the use of gestures.

Implications for the Teacher

The previous section addressed implications for the student, while this section addresses implications for the language teacher. These strategies are divided into things done at the classroom level, and those more targeted to the individual.

In the classroom. At the classroom level, it may be beneficial to play music or music videos in the target language between class periods, providing a receptive transition time for everyone while also providing exposure to the target culture (Purushotma, 2005). Creating an environment where it is okay to make mistakes has long been recognized as an important factor in language education (Corder, 1967; Hendrickson, 1978) and this is also beneficial to those who experience interference. If it is okay to make mistakes, then it is also okay if that mistake sometimes involves another language. Similarly, at the beginning levels, any interference that is present in the output should be ignored unless it impedes the goal of the lesson or the student's intended meaning is not understood. This is an extension of Corder's argument (1967) that errors not impacting comprehension should be ignored. At the intermediate to advanced levels, it may be more appropriate to gently and positively acknowledge that the response included a piece or pieces in a non-target language, and then to either provide the target structure or invite the student to try again, depending on if it is reasonable to expect the student to know the missing word or structure (Hendrickson, 1978).

I would also encourage a holistic approach to grading written work (Charney, 1984). If a student is using L2 conjunctions but is otherwise writing in their L3 at the

expected level, deducting points for each individual instance would not accurately reflect their ability to communicate in the L3. Diane Larson-Freeman phrases this differently, advocating for progress-based assessment:

> Looking at what learners are doing over time, expanding their repertoire of language resources, for instance, and defining progress in terms of where a learner wants to go, not looking at what the learner is not doing in light of some idealized "target" (Larson-Freeman, 2014).

This puts the focus on what the student can do now that they could not do previously instead of looking for ways in which they are not meeting the target provides a more comprehensive view of what the learner can do.

Individual Support. At the individual level, it might be helpful if students knew that this kind of interference is normal, that this is not a reason for them to question their sanity or their intelligence, nor is it a reason for them to give up learning the language. As language teachers are the community experts in language acquisition, it is the teacher's role to provide this kind of guidance, encouragement, and education about the language-learning process (Tea with BVP, episode 4). It may also be beneficial to turn it into a positive, to give the student a pep talk saying that the fact that their brain is making meaning-based connections across their non-native languages is actually a sign of their intelligence (Grosjean, 1982; Cook, 1992). While this assertion paraphrases Grosjean's and Cook's findings very loosely, it does turn the phenomenon into something positive, which shifts the student's attitude towards it, which will impact how the student experiences their interference (Smith, 1971).

If the teacher experiences interference, s/he should model it (Manz & Sims, 1981), demonstrate to the students how they should handle it: keep calm, focus on getting the point across even if the word does not come in the appropriate language. This demonstrates that it is normal and may help to remove or mitigate any negative judgments students may make of themselves when it happens to them. It also demonstrates that the teacher was able to communicate despite the interference, which may minimize any associated anxiety.

Summary

On the whole, these participants noticed their interference most when speaking and perceived it to affect their vocabulary most commonly. At the same time, for most participants it was an occasional or rare phenomenon, and they did not seem to be very frustrated by it. Of those who seemed to show some concern, they were primarily concerned about their interference when it interfered with their ability to communicate or when they believed their interlocutor was judging them negatively. Those who are less tolerant of their own mistakes in a language may be more frustrated by interference. While any language has the potential to interfere with any other language, a similar, stronger, and/or more firmly established than the target language tends to be the source of interference. While few learners had been given strategies, some multilinguals were aware of using strategies to minimize their interference. While the majority of these strategies are supported by more generalized research into second language acquisition, they have not yet been examined through the lens of how they may impact interference. Furthermore, successful strategies in dealing with interference may be subject to individual differences; what works well for one person may not work at all for another.

The final chapter will, review the limitations of this study and provide implications for the language student and the language teacher as well as suggestions for further research.

CHAPTER 5: CONCLUSION

Summary

These data suggest that among those who speak three or more language, interference among those languages is normal. For those who wish to eliminate negative transfer, elimination may be possible but is rare and probably is not a realist goal, particularly in the early stages of acquisition of the third language. At the same time, eliminating negative transfer is likely to also eliminate positive transfer, despite the fact that positive transfer can facilitate language learning (Grosjean, 2015). Furthermore, most participants in this study indicated that it is a source of humor, enjoyment, or texture; accordingly, eliminating interference would also make their language use less lively and dynamic, less interesting, and less effective. On those occasions when interference does inhibit communication, most participants were still able to circumlocute or otherwise get their point across, suggesting that it is not a significant challenge. According to the findings in this survey, for these participants the source language is likely to be a dominant foreign language (75%), a language begun prior to the target language (66%), or a related language (60%). If any those factors overlap, the overall odds that that language will be the source of interference increase. If a person with advanced knowledge of one Romance language begins another Romance language, they can expect their knowledge of their first to influence their acquisition of the latter. While this influence can be facilitative, as mapped in Chapter 2, it can also be an impediment. If a learner primarily notices the negative transfer, they may view the overall phenomenon in a more negative light and find it more frustrating than they

would if they were to primarily notice the positive transfer, or to notice both more equally.

While the data from this study appear to indicate that language transfer will manifest itself at all stages of acquisition and at all levels of proficiency, it does not necessarily appear to manifest itself *in the same way* at all stages of acquisition and levels of proficiency. Some participants reported an inverse relationship between their language proficiency and the frequency of interference; that they experienced interference more frequently in the early stages of their 3rd language, and less frequently as they became more proficient. This observation is supported by Cenoz (2001) and Hammarberg (2001). Cenoz reported more cases of transfer among her less-proficient participants, while Hammarberg's longitudinal study found the frequency of language switches decreased as the participant's proficiency increased. This relationship is logical: as proficiency develops, vocabulary expands, leaving fewer gaps in the learner's lexicon. As those knowledge gaps are opportunities for transfer, as the gaps diminish in number the transfer opportunities also diminish in number (Cenoz, 2001; Hammarberg, 2001). The implications of these findings will be discussed next.

Limitations

As the data used in this study was self-reported, it depended entirely on the individual participant's ability to notice and report their interference; therefore it is inherently less reliable than studies that include verifiable samples. Due to the open-ended nature of the question in which participants were asked to list their languages, there may have been a lack of consistency across participants. Some participants may have excluded some languages of which they have some knowledge. Similarly, there

may have been a lack of consistency across participants in answering the open-ended questions, as each individual's interpretation of the question and connotation of key terms would have influenced their response.

Due to an oversight in survey design, this study was not able to get a complete picture of the patterns of source and target language. In future iterations of this study, participants should be able to indicate all the language pairs in which they experience interference.

Recommendations for Further Research

All of the strategies suggested in this work need to be independently tested. Ideally, those studies would be longitudinal and involve multiple participants with similar language backgrounds, starting the same third language at the same time and with the same teacher. However, this idealized situation is rarely possible in multilingual studies, particularly in the context of the United States. It may be possible to approximate the scenario in Europe, where students commonly begin a third language in middle school.

The other major suggestion for further research is a more thorough investigation of what determines the source language of transfer. In order to more concretely determine the patterns of source and target language, an iteration of this study would need to be repeated in a way that allows participants to record all of the language pairs in which they experience interference, and to rank those pairs in order of frequency. Ideally, this self-reported data would be supported by speech or writing samples in each of the participants' languages.

Conclusion

This paper has demonstrated that interference is normal, and while it can be frustrating, multilinguals generally do not view it in a negative light. It is suggested that an individual may be able to exert a certain degree of control over it through certain behaviors and habits, and although those behaviors and habits do require further study, starting points for future research projects have been suggested.

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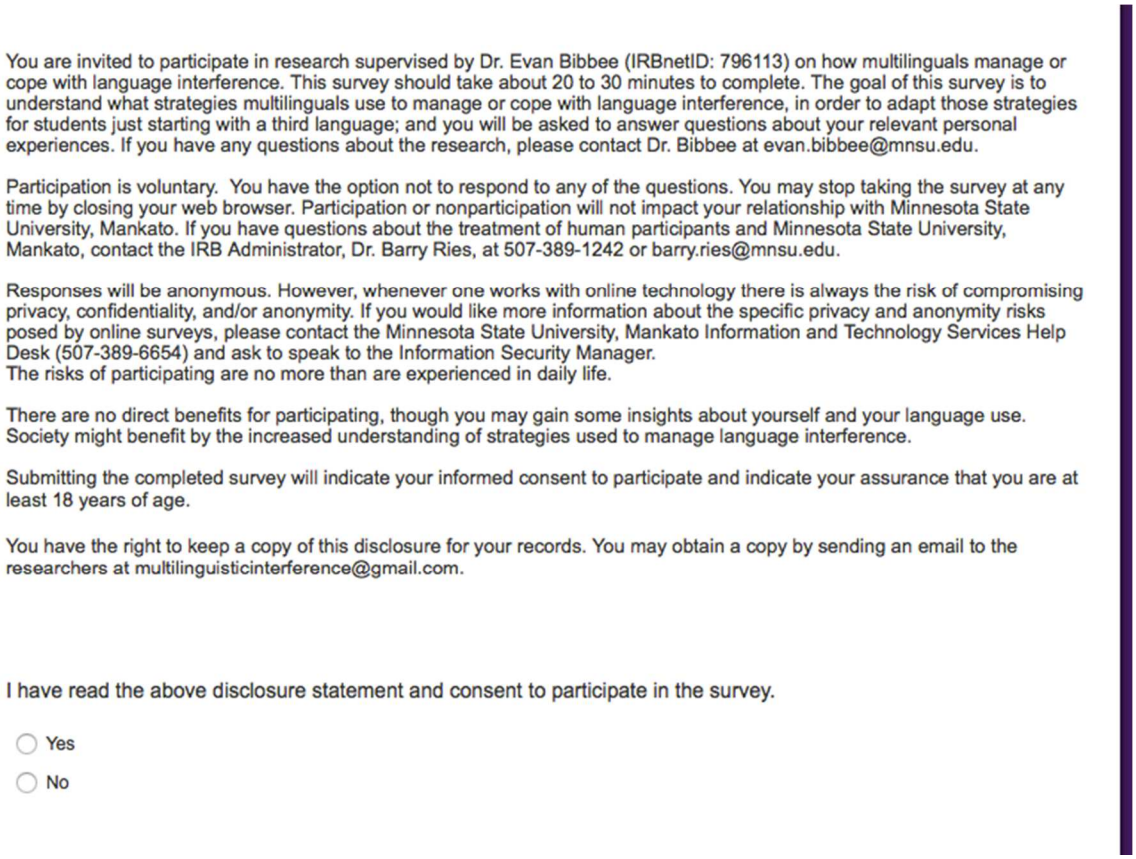
APPENDIX

APPENDIX A

The survey, with explanations of the built-in logic.

1. Consent statement.



You are invited to participate in research supervised by Dr. Evan Bibbee (IRBnetID: 796113) on how multilinguals manage or cope with language interference. This survey should take about 20 to 30 minutes to complete. The goal of this survey is to understand what strategies multilinguals use to manage or cope with language interference, in order to adapt those strategies for students just starting with a third language; and you will be asked to answer questions about your relevant personal experiences. If you have any questions about the research, please contact Dr. Bibbee at evan.bibbee@mnsu.edu.

Participation is voluntary. You have the option not to respond to any of the questions. You may stop taking the survey at any time by closing your web browser. Participation or nonparticipation will not impact your relationship with Minnesota State University, Mankato. If you have questions about the treatment of human participants and Minnesota State University, Mankato, contact the IRB Administrator, Dr. Barry Ries, at 507-389-1242 or barry.ries@mnsu.edu.

Responses will be anonymous. However, whenever one works with online technology there is always the risk of compromising privacy, confidentiality, and/or anonymity. If you would like more information about the specific privacy and anonymity risks posed by online surveys, please contact the Minnesota State University, Mankato Information and Technology Services Help Desk (507-389-6654) and ask to speak to the Information Security Manager.
The risks of participating are no more than are experienced in daily life.

There are no direct benefits for participating, though you may gain some insights about yourself and your language use. Society might benefit by the increased understanding of strategies used to manage language interference.

Submitting the completed survey will indicate your informed consent to participate and indicate your assurance that you are at least 18 years of age.

You have the right to keep a copy of this disclosure for your records. You may obtain a copy by sending an email to the researchers at multilinguisticinterference@gmail.com.

I have read the above disclosure statement and consent to participate in the survey.

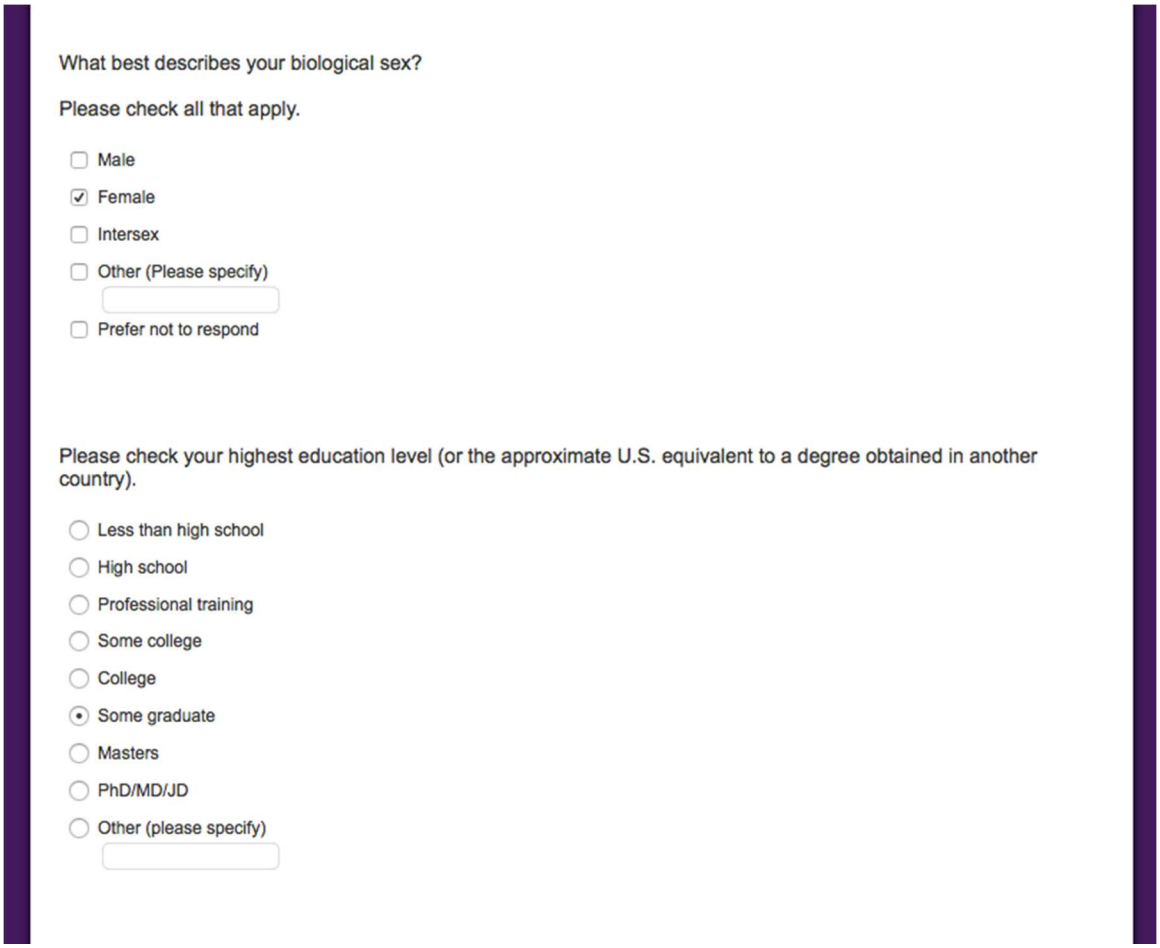
- ○ Yes
- ○ No

If "yes" was selected, the survey would continue. If "no" was selected, the survey was ended.

2. Age verification

If “17 or under” was selected, the survey was ended.

3. Demographic information



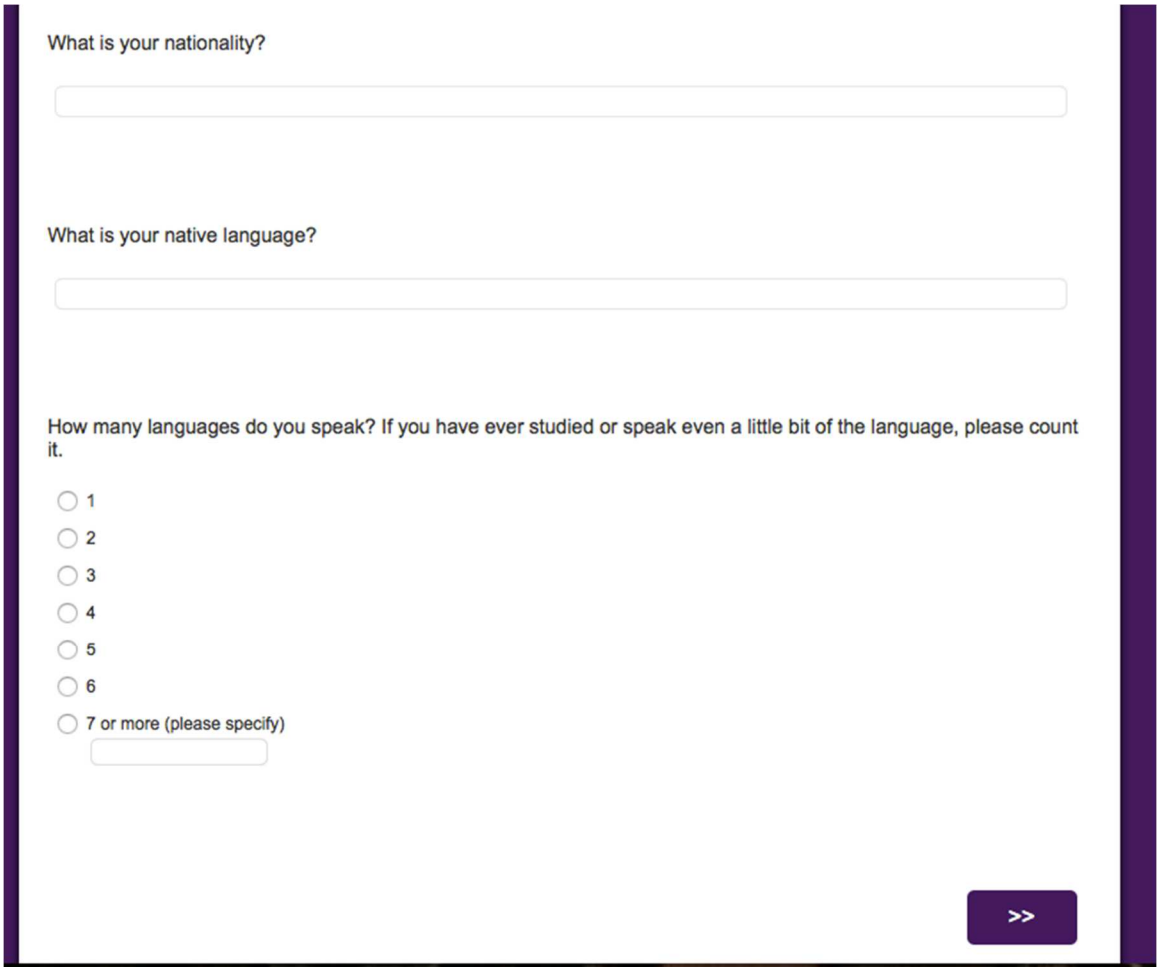
What best describes your biological sex?

Please check all that apply.

- [ ] Male
- [x] Female
- [ ] Intersex
- [ ] Other (Please specify)
- [ ] Prefer not to respond

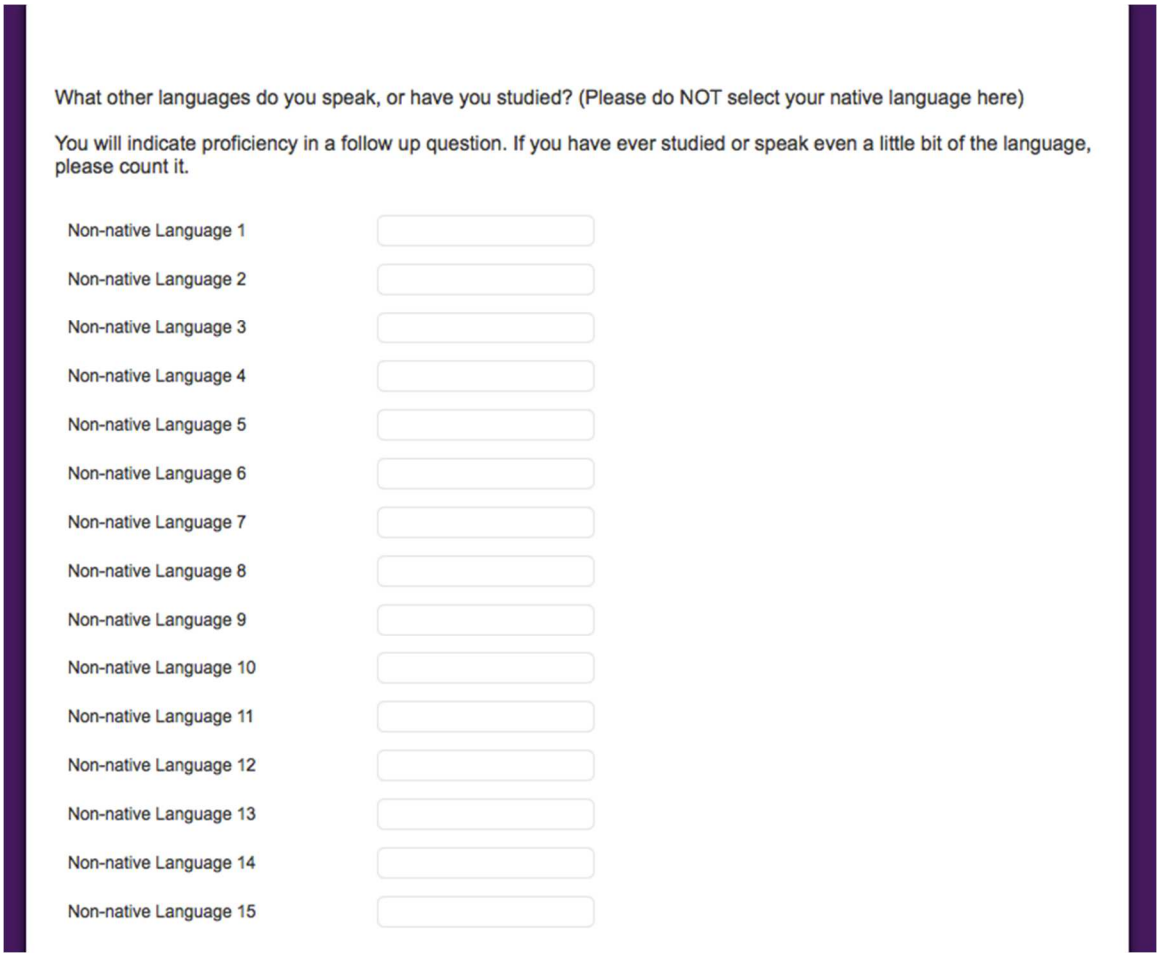
Please check your highest education level (or the approximate U.S. equivalent to a degree obtained in another country).

- ( ) Less than high school
- ( ) High school
- ( ) Professional training
- ( ) Some college
- ( ) College
- (•) Some graduate
- ( ) Masters
- ( ) PhD/MD/JD
- ( ) Other (please specify)

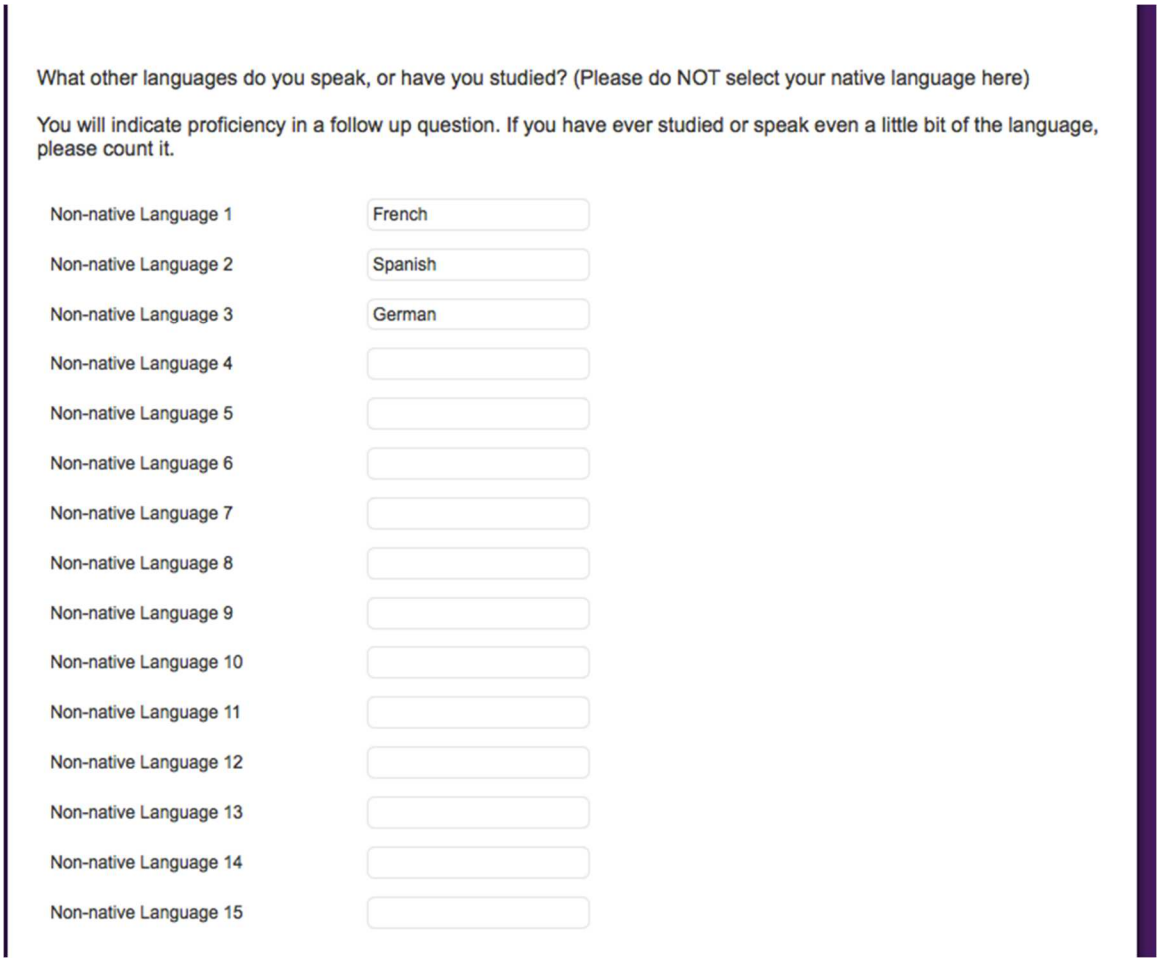


If in "How many languages do you speak," a participant selected "1" or "2," the survey was ended, as this study was looking specifically at multilinguals.

4. Language information



Participants typeed in their non-native languages here. These answers were piped into subsequent questions. For clarity, I have included an example below.



From this point forward; wherever you see “French, Spanish, German” listed, please understand that this represents piped answers. When a participant took the survey, their own answers appeared.

Please rate your proficiency in each language.

	Beginner: I know a few words or phrases	Basic: I can ask basic questions and understand the basics of the answer	Intermdiate: I can get by in daily and professional activities	Advanced: I can fully participate in daily and professional activities	Native-like: I can pass for a native speaker
French	○	○	○	○	○
Spanish	○	○	○	○	○
German	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○

In an average day, how do you use each language? Please make your best estimate, expressed as a percentage of 100.

Native Language	80
French	18
Spanish	1
German	1
Total	100

If the frequency in which you use your languages varies by season, please explain here. Additionally, if there is anything you would like to further explain or elaborate on, please do so here.

Please list the number of years and months you spent in each language environment.

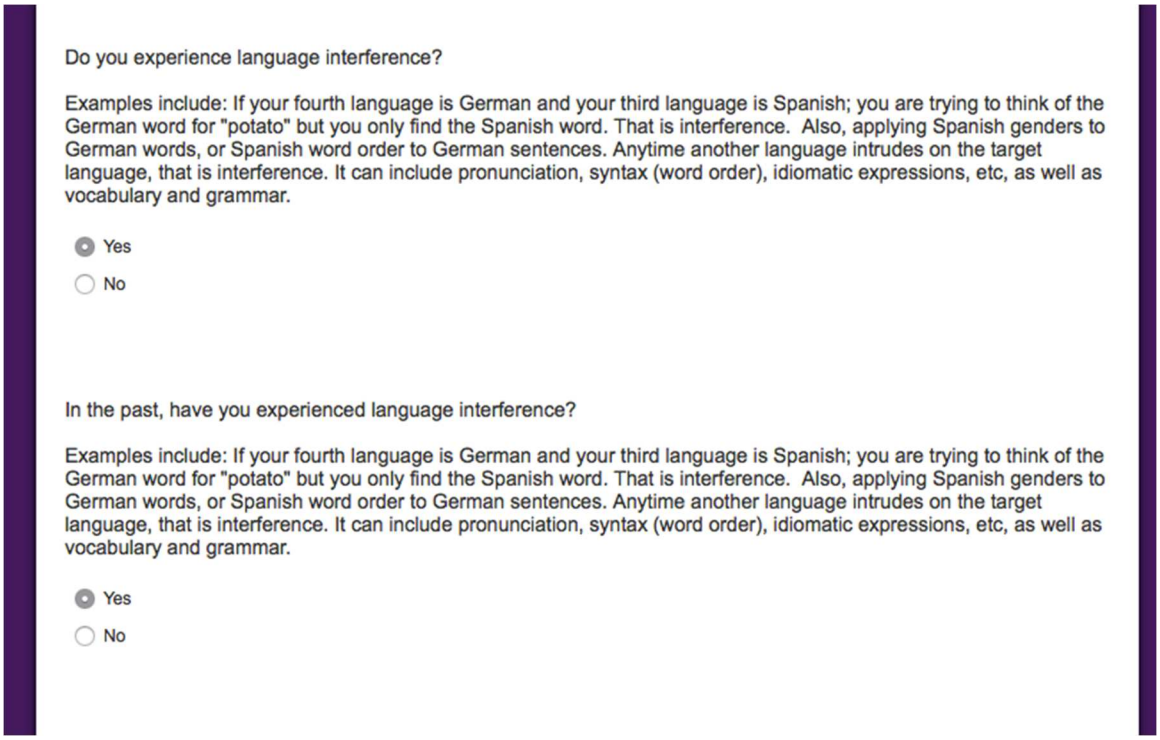
	A country in which the language is spoken: years, months	A family where the language is spoken: years, months	A school or work environment in which the language is spoken: years, months
French	0,5	0,4	5,0
Spanish	0	0	0
German	0	0	0

On a scale from 0 to 10, please select how much of the following factors contributed to you learning each language.
(0=did not contribute; 10=highly contributed)

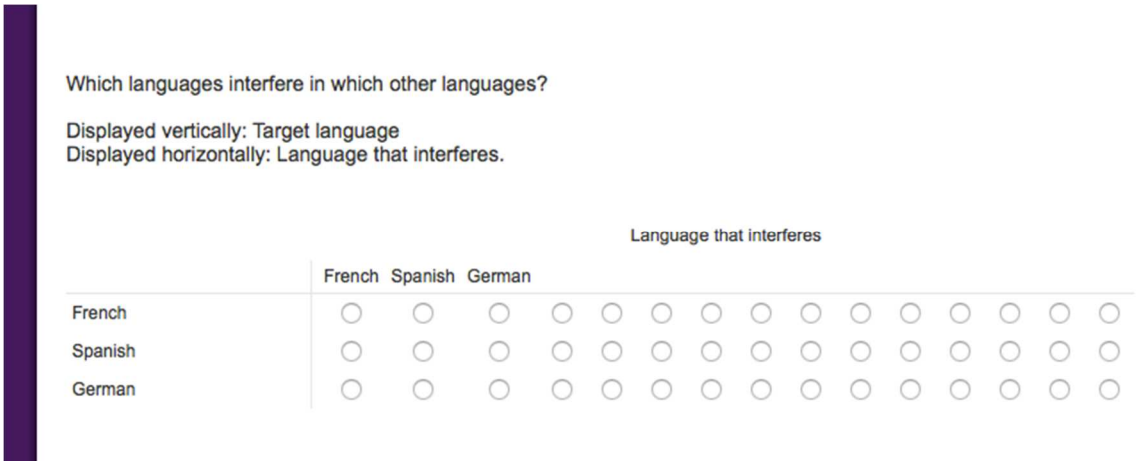
	Interacting with friends	Interacting with family	Reading	Language tapes/self-instruction	Watching TV	Listening to the radio	School or classroom	Summer camp
French								
Spanish								
German								

On a scale from 0 to 10, please rate to what extent you are currently exposed to each language in the following contexts:
(0=did not contribute; 10=highly contributed)

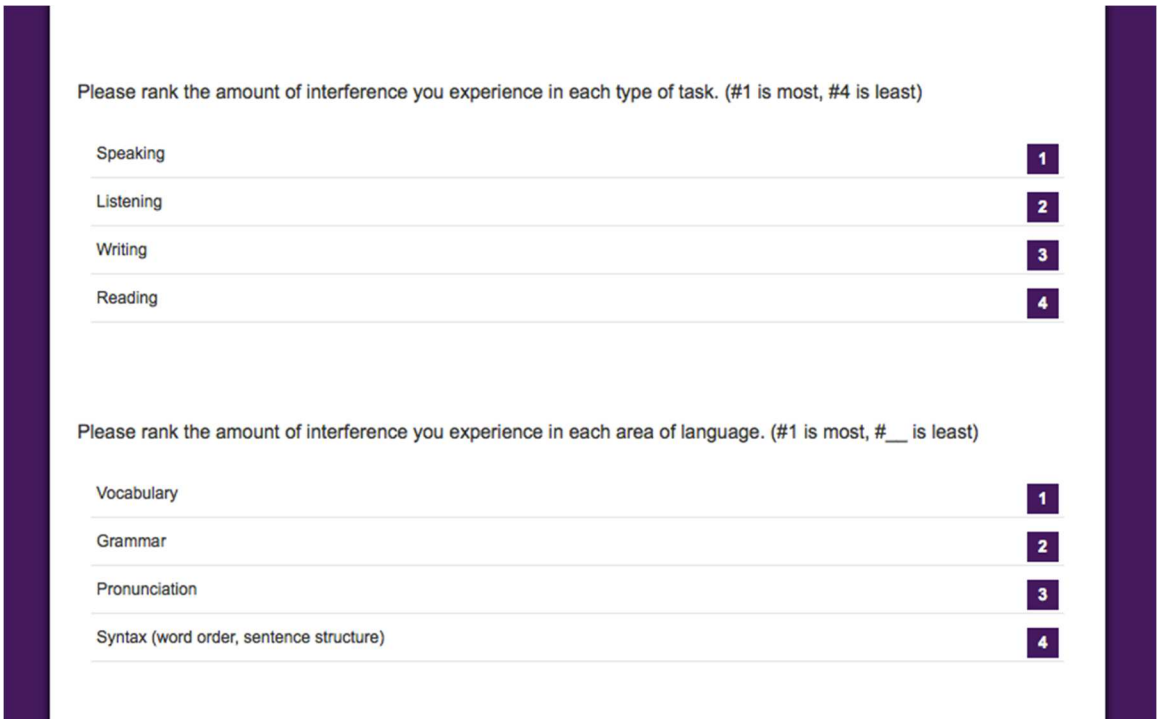
	Interacting with friends	Interacting with family	Reading	Language tapes/self-instruction	Watching TV	Listening to the radio	School or classroom	Summer camp
French								
Spanish								
German								

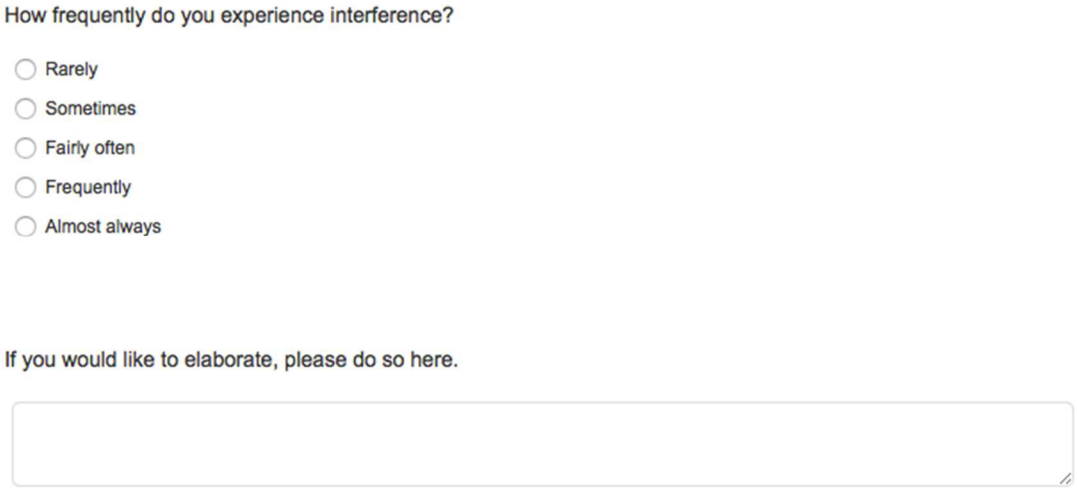


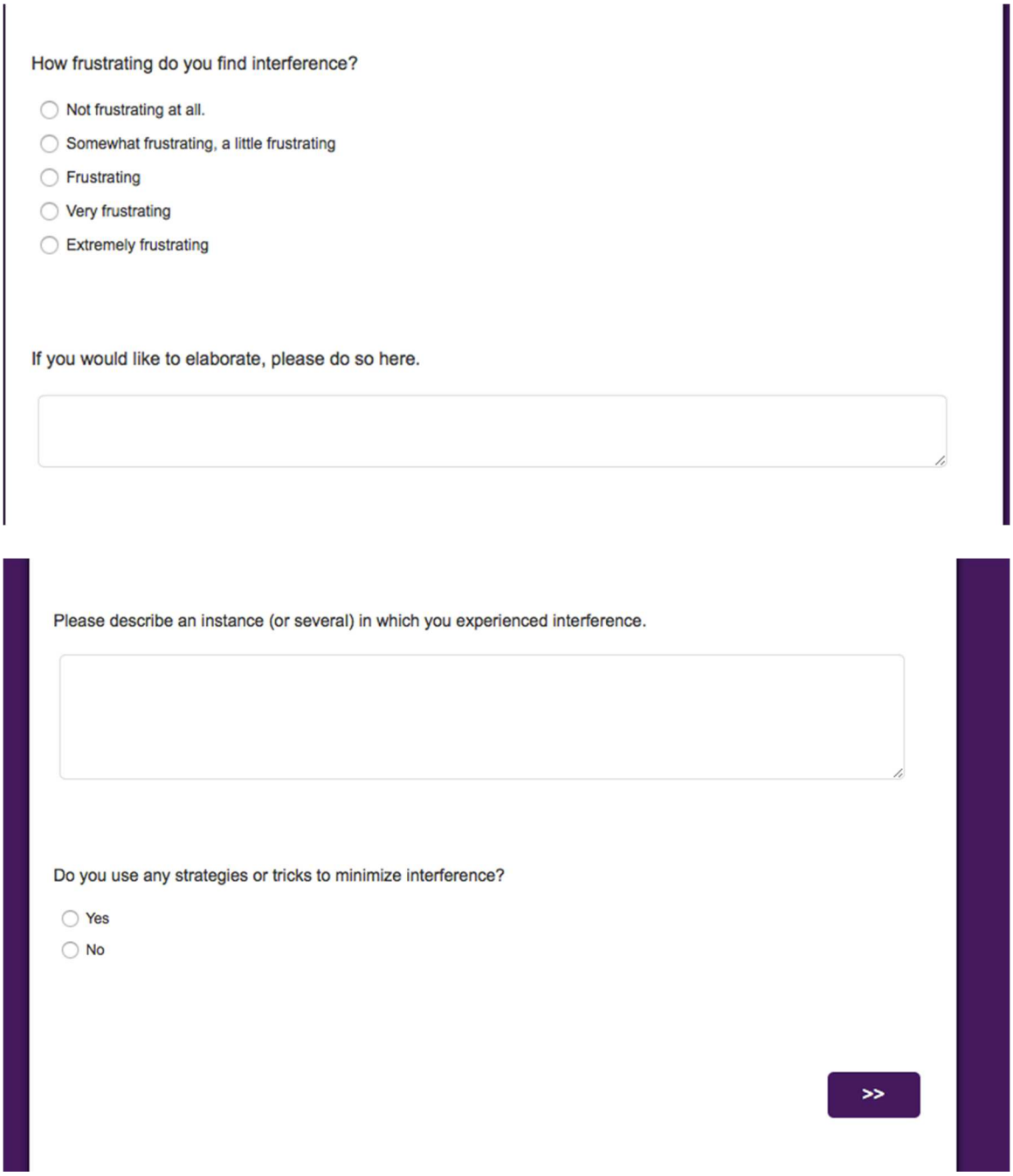
If a participant answered "yes" to either "Do you experience language interference?" or "In the past, have you experienced language interference," the following questions were displayed:



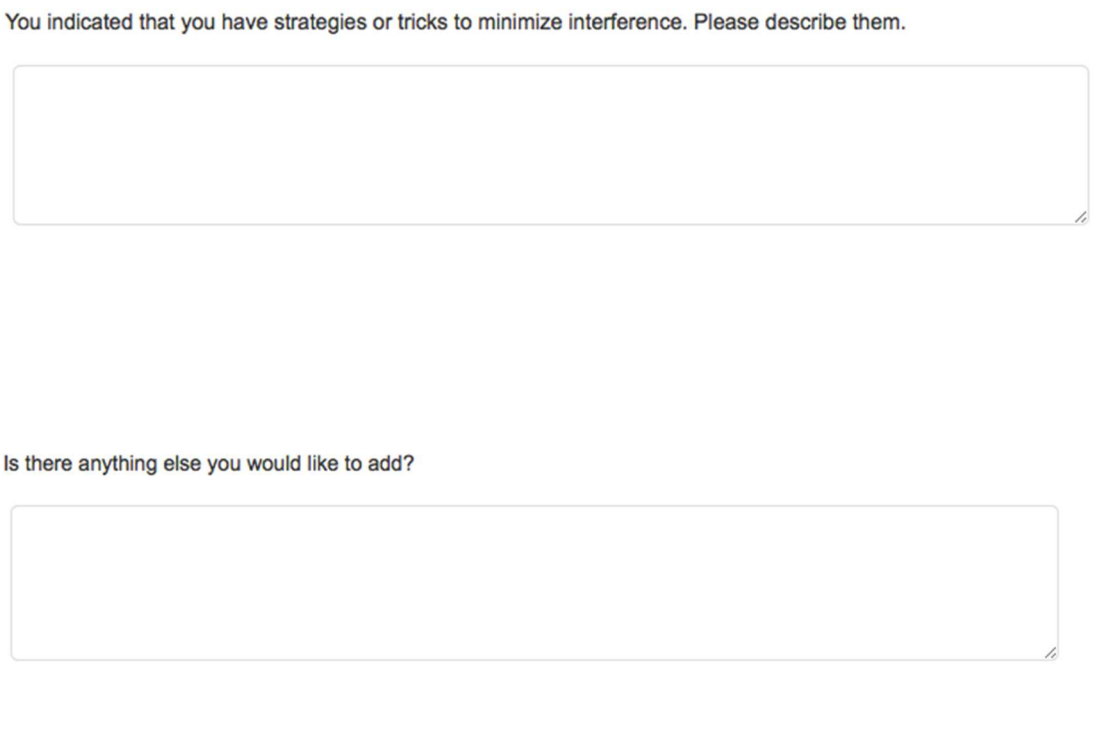
For the following two questions, participants clicked and dragfed each item into the appropriate order.



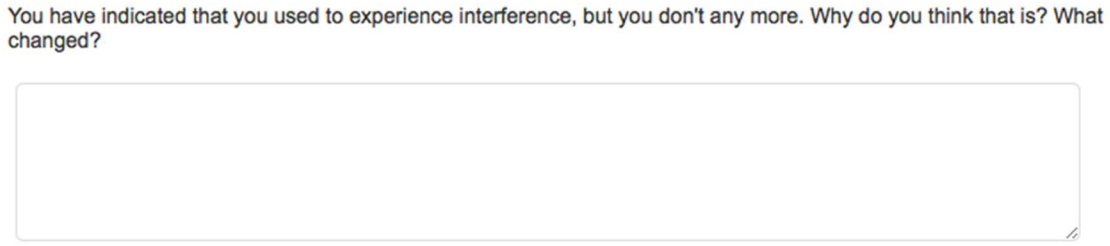




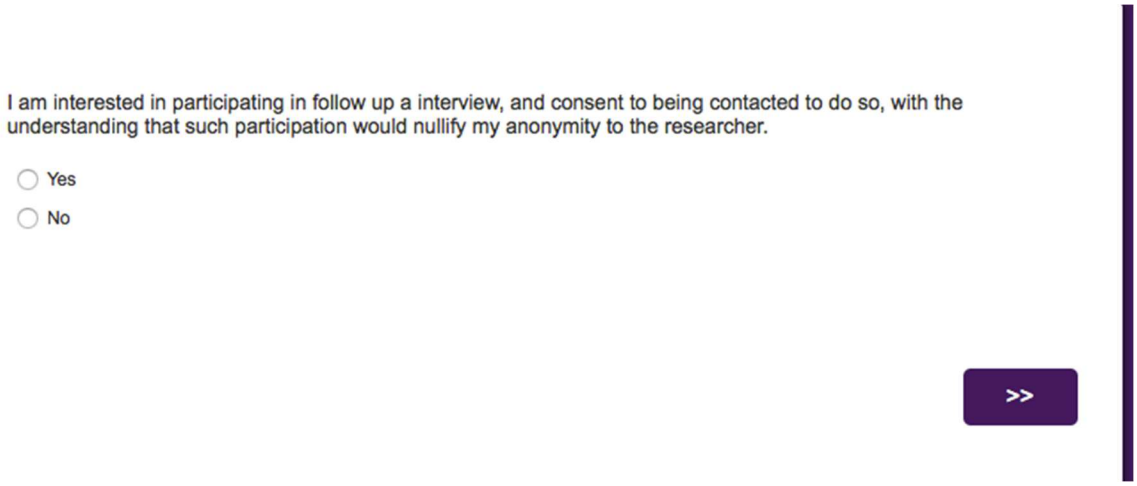
If the participant answered "yes" to "Do you use any strategies or tricks to minimize interference?" the below question "You indicated that you have strategies or tricks to minimize interference. Please describe them." was displayed.



If a participant answered “no” to “Do you experience language interference?” AND “yes” to “In the past, have you experienced language interference?” then the following question was displayed:

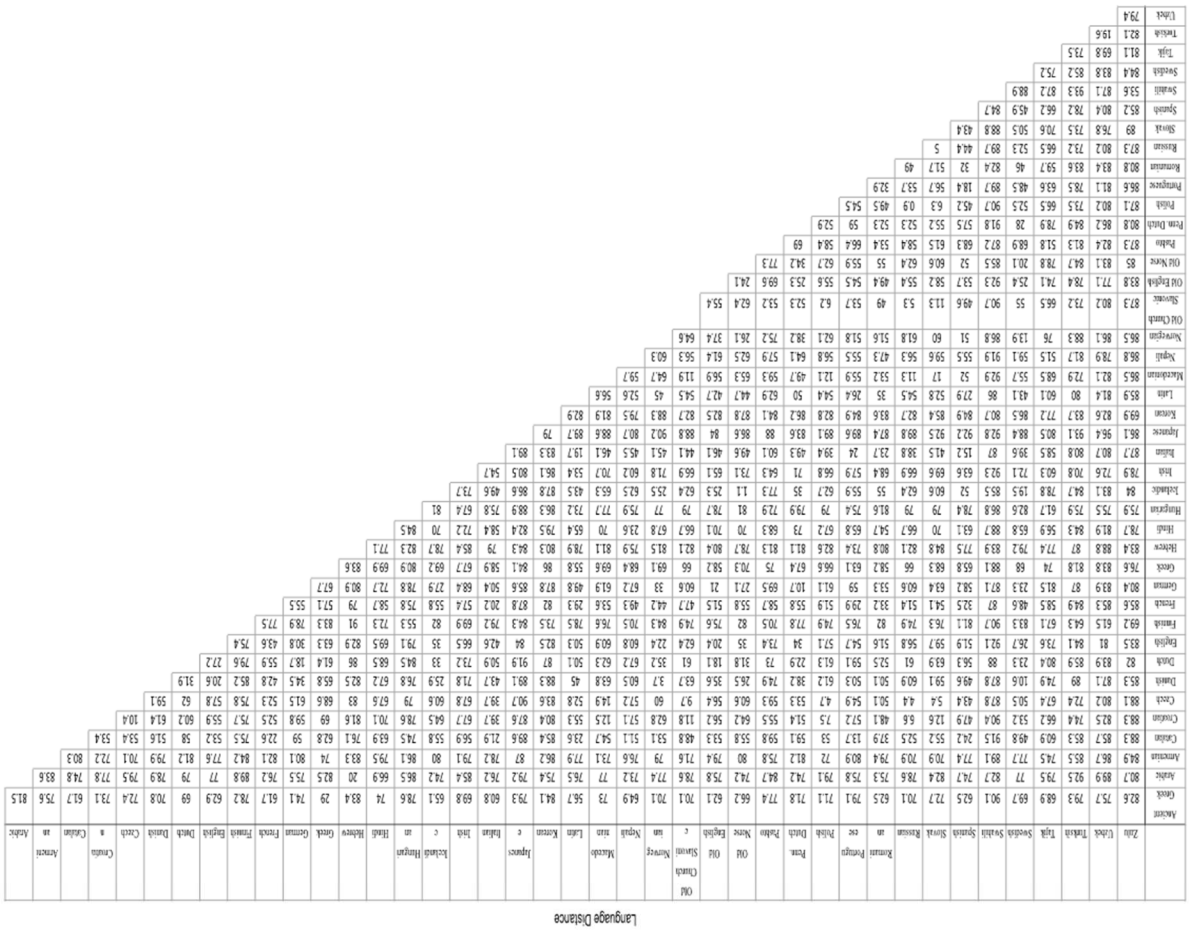


6. Follow up interview



If the participant selected “yes,” the following item was displayed. If they selected “no,” the survey was ended.

APPENDIX B



APPENDIX C

Table 19: Integrating dominance, order, and distance

	no relation		very remotely similar		remotely similar		similar		very similar		Total
Organized by dominance											553
i stronger and earlier	25	8.9	19	6.8	66	23.6	112	40	58	20.7	280
i stronger and same time	0	0	0	0	1	50	0	0	1	50	2
i stronger and later	6	11.8	1	2	17	33.3	18	35.3	9	17.6	51
i stronger, total	**31**	**9.3**	**20**	**6**	**84**	**25.2**	**130**	**39**	**68**	**20.4**	**333**
balanced, i ealier	3	9.4	1	3.1	7	21.9	14	43.8	7	21.9	32
balanced, same	0	0	0	0	0	0	14	93.3	1	6.7	15
balanced, i later	2	6.7	2	6.7	6	20	13	43.3	7	23.3	30
balanced, total	**5**	**6.5**	**3**	**3.9**	**13**	**16.9**	**41**	**53.2**	**15**	**19.5**	**77**
i weaker, earlier	4	13.3	2	6.7	9	30	12	40	3	10	30
i weaker, same	0	0	0	0	0	0	0	0	1	100	1
i weaker, later	11	9.8	9	8	24	21.4	52	46.4	16	14.3	112
i weaker, total	**15**	**10.5**	**11**	**7.7**	**33**	**23.1**	**64**	**44.8**	**20**	**14**	**143**
Organized by order in which they were acquired											553
i earlier and stronger	25	8.9	19	6.8	66	23.6	112	40	58	20.7	280
i earlier and balanced	3	9.4	1	3.1	7	21.9	14	43.8	7	21.9	32
i earlier and weaker	4	13.3	2	6.7	9	30	12	40	3	10	30
i earlier, total	**32**	**9.4**	**22**	**6.4**	**82**	**24**	**138**	**40.4**	**68**	**19.9**	**342**
same, i stronger	0	0	0	0	1	50	0	0	1	50	2
same, balanced	0	0	0	0	0	0	14	93.3	1	6.7	15
same, i weaker	0	0	0	0	0	0	0	0	1	100	1
same, total	**0**	**0**	**0**	**0**	**1**	**5.6**	**14**	**77.8**	**3**	**16.7**	**18**
i later and stronger	6	11.8	1	2	17	33.3	18	35.3	9	17.6	51
i later and balanced	2	6.7	2	6.7	6	20	13	43.3	7	23.3	30
i later and weaker	11	9.8	9	8	24	21.4	52	46.4	16	14.3	112
total, i weaker	**19**	**9.8**	**12**	**6.2**	**47**	**24.4**	**83**	**43**	**32**	**16.6**	**193**

APPENDIX D

Interview Consent Form

Thank you for your interest in participating in a follow-up interview. This is a research project investigating at how multilinguals manage interference, with an eye toward recognizing strategies that may be useful to budding multilinguals.

The interview will likely take 30-45 minutes, depending on the length of your answers. It may be conducted by phone, Skype, or Google Chat, based on your preference. During the interview, you will be asked more detailed questions about your experiences with language learning and linguistic interference. There is minimal risk involved; no more than is experienced in daily life. There are no direct benefits for participation. No participant will be referred to by name in any publication or presentation.

Participation is voluntary. Your decision whether or not to participate will not affect your relationship to Minnesota State University, Mankato, nor will a refusal to participate result in a penalty or loss of benefits. You may discontinue participation at any time by ending the interview. You may keep a copy of this consent form for your records.

With your permission, an audio recording may be made of the interview. You may consent to the interview without consenting to the recording, in which case no recording will be made. Recordings will not be played back in any presentation, and no participant will be referred to by name in publication or in presentation. The recording will be stored on a password-protected computer until the end of the project, at which time it will be erased.

This phase of the project has been approved by MNSU's IRB Board (IRBNetID: 870250). If you have any questions about your rights as a participant, please contact the IRB Administrator, Dr. Barry Ries, at 507-389-1242 or barry.ries@mnsu.edu

Please print and sign the attached consent form, and return it via any one of the following methods:

1. Scan and email to multilinguisticinterference@gmail.com.
2. Take a digital photograph and email to multilinguisticinterference@gmail.com.
3. Fax to 507-389-5887 ATTN: Amanda Ruskin, World Language & Cultures
4. Mail to Amanda Ruskin, World Languages & Cultures, AH 227, Minnesota State University-Mankato, Mankato, MN 56001. Postage will not be provided or reimbursed.

The signed consent form must be received before the interview can be conducted.
I have read and consent to participating in the follow-up interview.

name signature date

I consent to being recorded (please initial) _____
I do not consent to being recorded (please initial) _____

APPENDIX E

Follow Up Interview Questions

1. Which languages interfere with which other languages? For example, when you intend to speak [language X], which other languages come to mind (if any)?
2. Have you made an effort to keep up with all of your languages, or have some gone dormant?
    a. Which have gone dormant?
3. Describe your general attitude towards making mistakes in a language.
    a. How does this compare more generally to your attitude towards your own mistakes?
    b. Are there factors that may make you judge yourself more harshly than you normally would?
4. When you struggle to find a word in the target language:
    a. What do you do?
    b. Are you able to communicate the idea?
    c. Do you eventually find the word? If so, when?
    d. How does it feel?
    e. How is this process affected by emotional states? For example, when you are angry, or very hurt, or experiencing any kind of strong emotion.
5. In your opinion, how similar or different are your languages?
    a. If they are more similar:
        i. In what ways are they similar?
        ii. Do you try to use those similarities to your advantage? In what way?
        iii. How effective are those attempts?
    b. If they are more different:
        i. In what ways are they different?
        ii. Does your awareness of the differences influence your thought process when you are figuring out how to say something? (i.e., this adjective would go after the noun in French, but German is different so the adjective must go before) In what ways?
        iii. How effective are those attempts?
6. When you first began to experience interference, what do you wish your teacher(s) had told you about it?
7. Do you feel learning languages has shaped your personality, or the person that you have become? In what way(s)?
8. Language teachers:
    a. How do you handle your own language interference in the classroom?
    b. How do you handle your student's language interference?
    c. What effect do you think it is having?
9. Is there anything else you would like to tell me?