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Understanding L1-L2 Fluency Relationship Across Different Languages and Different Proficiency Levels

Olga Vyacheslavovna Maletina
Brigham Young University - Provo

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Understanding L1-L2 Fluency Relationship Across Different Languages and Different Proficiency Levels

Olga V. Maletina

A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Master of Arts

Wendy Baker-Smemoe, Chair
Grant Lundberg
Troy Cox

Center for Language Studies
Brigham Young University

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ABSTRACT

Understanding L1-L2 Fluency Relationship Across Different Languages and Different Proficiency Levels

Olga V. Maletina
Center for Language Studies, BYU
Master of Arts

The purpose of this research was to better understand the relationship between L1 and L2 fluency, precisely, whether there is a relationship between L1 and L2 temporal fluency measures and whether this relationship differs across different languages and different proficiency levels. In order to answer these questions, L1 and L2 speech samples of the same speakers were collected and analyzed. Twenty-five native speakers and 45 non-native speakers of Japanese, Mandarin Chinese, Portuguese, Spanish, and Russian were asked to respond to questions and perform picture descriptions in their L1 and L2. The recorded speech samples were then analyzed by means of a Praat script in order to identify mean length of run (MLR), speech rate, and number of pauses. Several different statistical analyses were then performed to compare these L1 and L2 temporal features across different languages and different proficiency levels.

The results of this study indicate that there is a strong relationship between L1 and L2 fluency and that this relationship may play a role in L2 production. Furthermore, it was found that native languages differ in their patterns of L1 temporal fluency production and that these differences may affect the production of L2 temporal fluency. It was also found that L1-L2 fluency relationship did not differ at different proficiency levels suggesting that individual factors may play a role in L2 fluency production. Thus, it was found that an Intermediate speaker of Spanish, for instance, did not speak faster than an Intermediate speaker of Russian, suggesting that naturally slower speakers in their L1 will still speak slower in their L2. These results indicate that fluency is as much of a trait as it is a state. However, it was also found that not all of the L1-L2 language combinations demonstrated the same results, indicating that the L1-L2 fluency relationship is affected by the L2. These findings have different implications for both L2 teaching and learning, as well as L2 assessment of fluency and overall language proficiency.

Keywords: fluency, second-language acquisition, proficiency
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CHAPTER ONE
INTRODUCTION

There is no doubt that in the 21st century knowledge of a second language (L2) has become particularly important in today’s globalized world. Knowledge of a L2 may affect one’s ability to gain and sustain a successful career not just for educators or linguists and interpreters, but also for many professions where such knowledge did not play a crucial role just a few years ago. Thus, engineers and businessmen, for example, are at a higher demand if they know a L2 because their ability to conduct business can be used in more areas (e.g., engineers can purchase equipment on site in person), and more effectively (e.g., businessmen can negotiate a deal without an interpreter) (Dustmann, 1994). The same situation can also be seen among immigrants that are now pouring into the more economically developed countries around the world.

Due to the fact that fluency is such an important factor in oral proficiency, many second language speakers wish to improve their fluency (Tavakoli, 2011). However, because oral fluency is so complex, it may not be an easy skill to develop. Segalowitz (2007), for instance, claims that fluency is highly dependent on underlying cognitive processes that need to function efficiently, and that higher levels of some of the aspects of fluency can only be developed through “extensive exposure and practice with the target language in naturalistic communicative situations” (p. 184). Hence, according to Segalowitz (2007), higher levels of L2 fluency are likely to be developed only if a learner gets enough practice in real-life communication act. In addition, it is also believed that native speakers tend to speak faster and with fewer pauses naturally, and a debate of whether this native-like fluency can be achieved by non-native speakers is still on-going (Tavakoli, 2011).
There are several factors that are believed to make fluency difficult to achieve. Temple (2000), for instance, proposes that native-like oral fluency is restricted by non-native speakers’ working memory capacity limitations. Based on previous research, she states that fluency in oral speech is determined by how automatically the learner can engage in information and preverbal processing. In addition, Segalowitz (2007) claims that fluency is restricted by several factors, such as the ability to keep focus on information presented and process information semantically. Thus, according to recent research, L2 fluency is a phenomenon that might be determined by different factors and therefore may be difficult to achieve.

Due to such high interest in fluency and its attainment in L2, a significant amount of research has been done on understanding L2 fluency (Chambers, 1997; Cucchiarini, Strik & Boves, 2002; de Jong, Steinel, Florijn, Schoonen & Hulstijn, 2012; Derwing, Munro, Thomson & Rossiter, 2006; Derwing, Munro & Thomson, 2007; Derwing, Munro, Thomson & Rossiter, 2009; Kormos & Dénes, 2004; Larsen-Freeman, 2009; Segalowitz, 2007; Tavakoli, 2011; Temple, 2000). In its broader sense, fluency is often used synonymously with overall oral proficiency (Lennon, 1990). In its narrower sense, however, fluency is defined as the ability to produce fluent and smooth speech as a result of underlying cognitive processing and is often measured by temporal measures of speech such as rate of speech, mean length of run, repetitions, repairs, number and length of pauses, etc. (Kormos & Dénes, 2004; Segalowitz, 2007). This study explores more the narrow sense of fluency. These definitions of fluency are discussed in more detail in Chapter Two.

Although some research has shown that higher levels of fluency can be achieved over time (Trofimovich & Baker, 2006) (in special circumstances such as immersion (Trenchs-Parrera, 2009) or by means of special teaching techniques (Tanner & Landon, 2009)), other
research debates that L2 fluency is more of a trait (a permanent individual characteristic) which is dependent on cognitive factors (such as working memory, for example) of an individual language speaker (Towell & Dewaele, 2005), and that achieving higher level of fluency for a relatively dysfluent speaker seems to be highly unlikely (Raupach, 1980 as cited in Derwing et al., 2009). Moreover, some researchers also suggest that some aspects of fluency could be traitlike (an individual characteristic one is born with) while others statelike (an acquirable characteristic), and that is dependent on the L2 learner’s developmental level (Derwing et al., 2009).

Unfortunately, not a lot of research has been done to understand the relationship between L1 and L2 fluency. Although some studies have attempted to look more closely at fluency in L1 and L2 (Kormos & Dénes, 2004; Derwing et al., 2006; Derwing et al., 2007), very few studies have focused on the relationship of L1 fluency and L2 fluency across different proficiency levels and different languages (Baker-Smemoe, Dewey, Bown & Martinsen, under review; Derwing et al., 2009, de Jong et al., 2012). Moreover, most studies have focused on either one or two language groups at a time (often from the same language family) or had very few participants (Derwing et al., 2009). Examining the L1-L2 fluency relationship and its behavior may help provide the necessary knowledge for obtaining better fluency, and therefore, overall oral proficiency, for both L2 learners and L2 educators. In addition, this knowledge may help improve automatic speech recognition software (Bernstein, Van Moere & Cheng, 2010; de Jong & Wempe, 2009), as well as be used in high-stakes assessment (Bernstein et al., 2010).

The Present Study

In the modern-day world that keeps becoming more and more globalized, simply speaking a second language may not be enough. Today, learners are particularly interested in
speaking a second language fluently. May it be an academic language course, a job, or an immigration program, fluency is playing a more crucial role than ever before. For a L2 learner fluency can mean as much as getting a job outside the country and an opportunity to gain foreign experience or even immigrate to another country. One may find that his or her ability to find a job might be dependent on his/her ability to speak the language fluently. This, however, does not mean that the speaker has to be a native speaker. Derwing and Munro (2009), for instance, showed that native English speakers preferred non-native speech if fluency and comprehensibility (or “native speakers’ perception of intelligibility” (Derwing & Munro, 1997)) rated higher than that of the native speaker, thus showing that fluency in speech was more important than native-like performance. Dustmann (1994) provided an even more interesting fact in that matter. He claims that not only can employability be affected by speaking fluently, but also employees’ earnings. He found that migrants with high speaking and writing abilities (particularly oral fluency) received earnings that were higher by 10.5 percentage points than that of migrants with poor speaking and writing abilities. Thus, speaking fluency has real world applications and therefore needs to be given adequate attention.

As for the academic world, fluency seems to be an integral part of every domain of language education (Tavakoli, 2011). With the growing demand for communicative language learning, fluency has lately come to play a central role in the L2 classroom. With the demand for better oral fluency growing in the world, L2 teachers and programs are adapting to provide better instruction to improve communication skills and oral performance. Sometimes classroom instruction is even built around activities, which can help learners develop their L2 fluency (Tavakoli, 2011).
Fluency is also an important factor when it comes to assessing overall language performance. Both in the classroom and in language, testing fluency is fundamental in defining language proficiency (Tavakoli, 2011; Kormos & Dénes, 2004). Thus, defining fluency and measuring it should be one of the main goals of current L2 research. This will help to understand what fluency is and how we can facilitate obtaining better fluency. Our research attempts to shed more light into the study of fluency and provides valuable insight into the L1 and L2 fluency relationship.

The focus of the present study is one of the few attempts to better understand the relationship between native and L2 fluency; more specifically, it attempts to understand the relationship between L1 and L2 temporal features of a particular speaker and look into whether this relationship differs for different languages and at different proficiency levels.

The primary research questions are:

1. What is the relationship between temporal fluency features (i.e., speech rate, number of pauses, and mean length of run) in the L1 and L2?

2. Does the relationship between L1 and L2 temporal fluency differ at different L2 proficiency levels (as measured by the ACTFL scale)?

3. Do L2 speakers of different languages achieve different fluency levels at the same oral proficiency level (as measured by the ACTFL scale)? In other words, do intermediate L2 speakers of Spanish have a faster speech rate than intermediate L2 speakers of Russian? Can these differences be explained by differences in the average speech rates of native speakers of those languages?

In order to answer these questions the present study was designed to collect speech samples in L1 and L2 in order to analyze temporal features of oral performance. The participants
involved were asked to 1) narrate a simple story based on a picture prompt and 2) answer a question. All of the participants had to do this twice – once in their native language and once in their second language. The data was then collected and analyzed acoustically, which provided the necessary analyses of the temporal features of the speech samples collected.

The current study is organized in the following way: Chapter two of this thesis focuses on the review of literature on this topic and discusses what fluency is; Chapter three presents the methodology for the present study including participants involved and the instrument used; Chapter four discusses the results of the study after the data were collected and analyzed, and lastly, Chapter five summarizes the results and concludes the current thesis with the discussion of the findings of the present study.
CHAPTER TWO
REVIEW OF LITERATURE

Introduction

Some studies have attempted to understand L1 and L2 fluency (Chambers, 1997; De Bot, 1992, Segalowitz, 2007; Segalowitz, 2013; Tavakoli, 2011; Tavakoli & Skehan, 2005). Very few studies (Baker-Smemoe et al., under review; Cox & Baker-Smemoe, under review; de Jong et al, 2012; Derwing et al., 2009), however, investigated the relationship between L1 and L2 fluency, which can shed much light on understanding fluency and its relationship to overall oral proficiency.

The present study attempts to help gain better understanding of the relationship between L1 and L2 fluency by examining several language groups from different language families (English, Japanese, Spanish, Portuguese, Russian, and Chinese Mandarin). Moreover, this study will not only look into several different native languages, but will also compare the native speakers’ data to their own L2 data, and will attempt to establish the relationship between L1 and L2 fluency and see whether (and how) this relationship differs at different proficiency levels in different languages.

This section begins with a discussion of what fluency means and the difference between fluency and proficiency in current-day research. Section two looks at different types of fluency that are important to know in order to understand and measure fluency. Section three discusses the current research on fluency and discovers the gaps in the topic of L1 and L2 fluency relationship. Lastly, section four discusses the present study and presents the research questions.
What Is Fluency

Fluency vs. proficiency

The debate over how to describe fluency has been going on for several decades (De Bot, 1992; Chambers, 1997; Freed, 2000). Segalowitz (2010) claims that,

Different authors define [fluency] differently; moreover, in some languages (e.g. French, Russian) the exact equivalent to the term fluency does not exist. For most, the qualities that make speech fluent include fast speech rate, and the relative absence of undue hesitations, pausing, repetitions, and repairs. For some, fluent speech is also speech that is accurate, appropriate, and natural in terms of the conventions of language use (p. 240).

These different views on fluency lead to the ongoing debate over and the constant search for the most accurate definition of fluency.

Quite often in the second language teaching community fluency is used interchangeably with overall oral proficiency (Chambers, 1997; Kormos and Dénes, 2004). Tavakoli (2011) supports this view by stating that in its broader sense fluency is also called ‘global oral proficiency.’ This means that when it comes to second language fluency we often think of it as language proficiency. Indeed, oftentimes when we are asked about the level of our language proficiency, we say: “I’m fluent” or “I speak the language fluently” (Kormos and Dénes, 2004).

At times the notion of fluency may even mean “native-like” – the term often used to describe someone who is quite competent at speaking a foreign language (Chambers, 1997).

Oxford English Dictionary (as well as some others, such as “Encyclopedia of Language” and “The Concise Oxford Dictionary” (Chambers, 1997)) also gives a similar definition of fluency. In regards to language, the Oxford English Dictionary describes fluency as “smooth and
easy flow” and “readiness and smoothness [of speech]” (“Oxford English Dictionary,” n.d.).

Thus, again, fluency is seen as an overall language competency.

In his attempt to describe fluency, Fillmore (1979) gives it several characteristics. The first characteristic he gives conceptualizes fluency as the ability to speak at length, filling up the gaps (pauses) with talk. The second characteristic defines fluency as the ability to talk in a “semantically dense” manner without hesitations. The third characteristic describes fluency as the ability to speak in a wide variety of contexts. Lastly, a speaker must have all of the aforementioned speech characteristics to be called ‘fluent’ (p. 93). Tavakoli (2011) states that Fillmore’s “definition is very extensive, but it is unclear how this conceptualization differs from the definition of global oral proficiency.”

Thus, fluency is often defined as “spoken language competence,” (Kormos and Dénes, 2004) or an overall oral proficiency and, in this sense, is often used interchangeably with ‘proficiency’.

Types of fluency

Some researchers, however, see fluency as a more complex phenomenon. Tavakoli (2011) claims that definitions of fluency range from fluency being defined as “global oral proficiency” in its broader sense to speed of speech in its narrower sense. Moreover, some researchers see fluency as an even more complex phenomenon that absorbs both of these views of fluency. Segalowitz (2010), for instance, gives the following definition of fluency:

L2 fluency refers to the “features of L2 oral performance that serve as reliable indicators of how efficiently the speaker is able to mobilize and temporally integrate, in a nearly simultaneous way, the underlying process of planning and
assembling an utterance in order to perform a communicatively acceptable speech act.” (p. 47).

In this statement Segalowitz (2010) claims that fluency is a multifaceted phenomenon where oral performance is dependable upon the underlying processes in the mind responsible for converting thought into speech, and that these processes are revealed in oral performance features. Hence, he claims that there are at least three types of fluency – cognitive fluency, temporal, or utterance, fluency, and perceived fluency. They will be discussed next.

*Perceived fluency*

De Jong et al., (2012) describe perceived fluency as “inference listeners (raters) make on the basis of the utterance about speakers’ ability (about speakers’ cognitive fluency)”. In other words, it is the “impression” that a listener has of the speaker’s fluency (de Jong, 2012). This listener’s ‘opinion’ on a speaker’s fluency has been used to rate fluency in many studies (Kormos & Dénes, 2004; Cucchiarini et al., 2002; Rossiter, 2009). However, the rater’s perception of fluency may not be the best predictor of fluency scores because the fluency ratings are dependent on raters’ notions of fluency or the instructions they receive (de Jong et al., 2012). For instance, in some studies (Rossiter, 2009; Derwing, Rossiter, Munro, & Thomson, 2004), the raters received particular instruction on what constitutes fluency and what they should be looking for when rating speech samples (pauses, repetitions, false starts). However, in other studies (Kormos & Dénes, 2004; Cucchiarini et al., 2002), the raters did not receive particular instructions, which resulted in the raters using their own definitions of fluency. This, according to de Jong et al., (2012), may have an unpredictable outcome. They state, “It is therefore questionable whether defining fluency as a listener construct will result in the
best notion of fluency, especially when it is used as a component of speaking proficiency, as is the case in current oral proficiency assessment” (p. 896). Thus, perceived fluency may produce subjective results that could be dependent on a rater’s notion of fluency, and therefore produce inconsistent results (de Jong et al., 2012).

Cognitive fluency

Segalowitz (2007) refers to cognitive fluency as the ability to produce fluid (fluent) speech as a result of underlying cognitive processing related to productive and receptive language capability (i.e. ability to access words, phrases, sentences, etc. in the L2 easily). He states that in regards to language performance, fluency means “speaking or reading at an appropriate rate, speaking without undue hesitation or pauses, comprehending rapidly presented oral or written language, and the ability to perform under a range of social and physical circumstances” (p. 181). He adds, however, that a successful L2 learner not only needs the knowledge of syntax, phonology, morphology, etc., but also needs to “be able to implement that knowledge in an appropriately fluent manner” (p. 182), thus claiming that, in order for an L2 speaker to be fluent, the cognitive processing that transforms thought into speech has to function properly. In order to look more closely at cognitive fluency, one needs to know about the two main aspects of it – access fluidity and attention control.

Access fluidity. According to Segalowitz (2007), an important component of fluent speaking, reading, and listening is the process of “connecting words and expressions to their meaning,” which is also called access fluidity (p. 182). Access fluidity can be defined by several factors such as “speed of processing, stability of processing, the ballistic (unstoppable) nature of the processing, the effortlessness of processing,” etc. (Segalowitz, 2013, p. 242). He compares access control to mental traffic’s flow where one moves from point A to point B (where A is a
symbol and B is the symbol’s meaning) (Segalowitz, 2013). If there are many interruptions on the way, then the ability to move from point A to point B might be slowed down. He also claims, however, that this automatic processing may be slow by nature (Segalowitz, 2013). Thus, access control is an innate ability to process connecting words to meaning, and plays an important role in understanding and measuring fluency.

**Attention Control.** Another very important aspect of cognitive fluency is called *attention control*. Attention control is the “process by which a language user focuses and refocuses attention in real time as the message being communicated unfolds” (Segalowitz, 2007, p. 182). *The man stood under a window* and *There was a window right above where the man was standing* describe the same scene; however, each of these sentences carries an entirely different meaning because of different structure, function words, and other grammatical features that are being used to construct the sentences (Segalowitz, 2007). Thus, the ability to keep and shift attention when needed to achieve fluent speech is also an important aspect of cognitive fluency and needs to be considered while studying the topic of fluency.

Hence, attention control and access fluidity, among other cognitive abilities, are important aspects that underlie cognitive fluency and need to be paid attention to in Second Language Acquisition (SLA) research and L2 teaching when it comes to understanding and acquiring fluency in L2. Segalowitz (2007), for instance, claims that “laboratory-based measures of cognitive fluency may be able to contribute to the broader study of SLA, and reciprocally, research addressing broader communicative issues in SLA may make important contributions to our understanding of how and under what conditions cognitive fluency develops” (p. 185).
Utterance fluency

According to research in linguistics, psycholinguistics, and neurophysiology, it is the underlying cognitive processing that is responsible for production of speech. However, in order to evaluate and measure fluency many researchers agree on assessing temporal variables of fluency due to the difficulty of accessing processes of language production (Segalowitz, 2013; Chambers, 1997). Chambers (1997) gives a good example of why it is difficult by comparing such measure to figure skating,

Whereas appreciating a skill is a qualitative judgment (one is reminded of the mark for artistic interpretation in ice-skating implied by terms such as ‘smoothness’ or ‘ease’), a performance in real time has quantifiable aspects such as rate of speech, frequency and location of silences and hesitations. (p. 538).

Thus, in order to measure fluency, one needs to have some sort of variables that can be identified and measured (Chambers, 1997).

Tavakoli and Skehan (2005) suggest that there are three aspects of temporal fluency: breakdown fluency (the flow of speech without hesitations or pauses), speed fluency (the rate of speech measured in number of syllables per second), and repair fluency (how often speakers make corrections, use false starts or repetitions (Cox & Baker-Smemoe, under review; de Jong, 2012)). Thus, most studies that examine fluency, concentrate on temporal features of fluency (Cox & Baker-Smemoe, under review; de Jong, 2012) because some researchers claim that these features are closely associated with perceived and cognitive fluency (Cox & Baker-Smemoe, under review; Derwing et al., 2004; Derwing et al., 2006; Kormos & Dénes, 2004).

Speech rate, number of pauses and mean length of run were found to be good predictors of perceived fluency (de Jong et al., 2012) and were identified to be the most “related to
perceptions of fluency as well as overall oral proficiency” (Baker-Smemoe et al., under review; Cox & Baker-Smemoe, under review; Cucchiarini et al., 2002; Kormos & Dénes, 2004). These temporal features will be discussed in more detail below.

**Speech rate.** Speech rate (also called speaking rate (Towell, Hawkins & Bazergui, 1996)) is defined as the rate at which speech is produced, and represents “the number of syllables divided by total time” (de Jong et al., 2012, p. 912). According to de Jong and Wempe (2009), speech rate is used not only in SLA research, but also in speech and language pathology and in automatic speech recognition systems development. It is also one of the best predictors of perceived fluency (de Jong & Wempe, 2009; Kormos & Dénes, 2004).

**Pauses.** Pauses also constitute fluency and can be good predictors of fluency (Chambers, 1997; Tavakoli, 2011). Researchers distinguish between silent, or unfilled pauses (silences), and filled pauses (non-silent stops in phonation in the form of lexical or non-lexical fillers) (Chambers, 1997). The debate on how long a pause should be to be considered a pause is still on-going (Towell et al., 1996) with some researchers believing that a cut off point should be at as low as 100 milliseconds, while others as high as 400 milliseconds (Towell et al., 1996). For the purpose of this study silences of over 250 milliseconds or over were considered pauses (Cox & Baker-Smemoe, under review; de Jong et al., 2012). Although pauses are present in a speaker’s first language (Derwing et al., 2009), they are often considered to be one of the main characteristics of dysfluent speech, especially in L2 (Chambers, 1997). Chambers (1997) claims that, even though pauses are acceptable in L1, not all pauses are acceptable in L2. A study by Tavakoli (2011) supports this view, suggesting that it is not the number of pauses that influence a speaker’s perception of fluency, but rather where those pauses are produced. While ‘natural’
pauses are produced at the end of clauses or semantic units, ‘unnatural’ pauses occur in other places, thus “showing either lexical or morphological uncertainty” (Champbers, 2011, p. 539).

**Mean length of run (MLR).** Mean length of run (also, *mean length of utterance*) is determined by averaging the number of syllables produced between pauses of .25 seconds or above (Cox & Baker-Smemoe, under review, Kormos & Dénes, 2004; Towell et al., 1996). Several studies have shown that MLR is a strong predictor of fluency (Cucchiarini, Strik, & Boves, 2000; Kormos & Dénes, 2004). One study reveals especially interesting results. Towell et al. (1996) discovered that after having spent a certain amount of time abroad, a group of advanced learners of French showed higher levels of fluency not in regards to the amount of pauses or their utterance speed, but in the length and complexity of utterances between pauses, thus showing the importance of MLR in studying fluency.

These temporal features are considered to be some of the most important aspects of utterance fluency (Cox & Baker-Smemoe, under review), and are often used as measures of fluency, which can be measured manually or, thanks to the modern-day technology, by special software programs (Segalowitz, 2010). One such cost- and time-saving computer program is called Praat (Dutch for ‘talk’). It is a free software program that can analyze, synthesize and manipulate speech. It is widely used by phoneticians, and has recently received its popularity in SLA research due to the ability to measure temporal variables of speech production. In this study temporal features of fluency were measured by Praat and using scripts developed by de Jong and Wempe (2009).

Chambers (1997) states that although we are narrowing the meaning of fluency simply to temporal features, such constriction “provides a useful anchorage for a concept which is prone to vagueness and multiple interpretations” (p. 538). Hence, by narrowing it down to quantifiable
variables such as rate of speech, number of pauses, number of syllables per second, etc., researchers are able to have a solid set of measurable aspects of fluency which they can use to measure fluency. Thus, in a more narrow view fluency is described as a temporal phenomenon that is considered to be only one aspect of oral language proficiency (Kormos & Dénes, 2004). All of these utterance features are quantifiable and provide opportunity to measure and evaluate fluency.

Current Research on the Influence of L1 Fluency on L2 Fluency

Some of the goals of this research are to see how fluency is different at different proficiency levels and how temporal features differ by second language at the same proficiency level. This may have implications for L2 learning and teaching, as well as language assessment and ASR application because taking L1 fluency production into consideration when assessing L2 fluency may provide more accurate results in oral proficiency ratings (Segalowitz, 2010) which has important implications for L2 teaching and learning as well as L2 testing and SLA research in general. Unfortunately, there has not been much research done to provide sufficient information on this topic. Some of the most valuable research as it pertains to the topic of L1-L2 fluency relationship is discussed below.

One study by Tavakoli (2011) sheds light on how the temporal features of L2 learners differ from those of native-speakers. In the study, L2 learners and native speakers of English were compared in terms of number of pauses and total amount of silence in the end of clauses. Forty native speakers of English and forty L2 speakers were recorded narrating picture stories. The qualitative analyses showed that there were no significant differences in the number of pauses and the amount of pauses between the native speakers of English and the L2 speakers, but rather where those pauses and the silence occurred. It was found that native speakers tend to
pause at the end of the clause, while L2 speaker’s speech is characterized by mid-clause pauses. Although this study provides valuable information on formulaic characteristics of native-like fluency, it compares only native and non-native speakers of one language, and gives only general data on temporal features patterns across languages, not answering the question of whether individual temporal features transfer from L1 to L2.

One relatively early study that sheds some light on the relationship between L1 and L2 fluency was conducted by Riazantseva (2001) who examined the relationship between L2 proficiency and pausing patterns in the speech of Russian speakers of English. The participants were divided into two groups – the lower proficiency and higher proficiency group. The two groups were then recorded narrating on a given topic and describing a cartoon both in English and in Russian. The results showed that the relationship between L1 and L2 pausing patterns was stronger at the intermediate level than at the advanced level of proficiency. However, this study is limited in the amount of participants and the languages studied, thus, making it hard to know whether these results are generalizable to other languages (de Jong et al., 2012). Also, although both studies (Riazantseva, 2001 and Tavakoli, 2011) examined the relationship between L1 and L2 fluency, both of these studies involved two different groups of speakers – one group of speakers for the L1, and another group of speakers for the L2, hence, not providing L1-L2 fluency data of the same speaker. The current study, however, examines the L1-L2 fluency relationship of the same speakers, thus ensuring that L1 individual differences are taken into account (de Jong et al., 2012).

Another study provides more insight on how fluency in the second language is affected by fluency in the learners’ first language. Derwing, Munro, Thomson, & Rossiter (2009) conducted an investigation on Chinese Mandarin and Slavic (Russian and Ukrainian) speakers’
temporal features to see how first language temporal features affect learners’ temporal features in their second language and whether fluency can be transferred from one language to another, or it is independent from the native language’s influence. The study involved twenty Mandarin and twenty Slavic immigrants to Canada, who were enrolled in an ESL program. Over the course of 10 months the researchers tracked the participants’ accent and fluency development by recording their speech samples at the beginning of the study, two months after the study began, and 10 months after the initial recording. The researchers found that the correlation between L1 and L2 was stronger on the initial stages of language learning of Slavic speakers than of Mandarin speakers. In the more advanced stages, however, this correlation was not significant. Even though this study brings insight on two of our research questions (how do temporal features differ across languages and whether they transfer from the L1 to L2), the relationship between L1 and L2 fluency was found only at Time 1, and this relationship was stronger in Slavic speakers than Mandarin speakers. Also, the amount of languages involved in their study was not sufficient to obtain a clear picture of language specific differences in temporal features. Different families of languages are characterized by different patterns of pausing and overall speech rate, and therefore several different languages need to be looked at to obtain more reliable data on language-specific temporal features (de Jong et al, 2012; Segalowitz, 2010).

A more recent study (submitted for publication) that brings even more light on the L1 and L2 fluency relationship was conducted by a group of Brigham Young University professors who expanded the number of languages, thus examining the L1 and L2 fluency relationships across more L2s and more proficiency levels (which varied from Novice-High to Superior). For their study Baker-Smemoe, Dewey, Bown and Martinsen (under review) examined speech samples of over 80 native English speakers who spoke one of the five following languages: Russian, French,
German, Arabic and Japanese. In order to conduct the study, the researchers used 20-second segments from the official ACTFL Oral Proficiency Interviews that the students had already taken by the time of the study. Each of the segments was then analyzed for number and length of pauses, number of false starts, number of hesitations, number of syllables per second, number of runs, and mean length of run. The results revealed that certain fluency measures differ across different proficiency levels; however, this correlation was stronger at the main proficiency levels (less clear in the sublevels) and for the more advanced levels of proficiency (Advanced and higher). They also found that temporal measures differed across different languages (speakers of Arabic were less fluent than speakers of German, for instance). Although this study presents the first attempt to look into several languages and different proficiency levels, it does not provide native speaker fluency measures for all of the languages that were examined, and does not answer the question of how these fluency measures are compared to the fluency measures of native speakers, nor did it examine the L1 fluency of the participants.

Another recent study by de Jong et al. (2012) attempted to look at L1 and L2 fluency relationship. de Jong et al. (2012) examined fluency measures of 51 native Turkish and English learners of Dutch. In order to measure the participants’ temporal features they were asked to complete several speaking tasks in their L1 and L2 (Dutch), after which they were asked to take a Dutch vocabulary test which was intended to measure the participants’ overall Dutch proficiency. The results showed a relationship between L1 and L2 fluency, suggesting that L2 fluency may somewhat be predicted by L1 fluency. Moreover, this relationship was found across all three types of utterance fluency – breakdown, speed and repair fluency. However, the results have also shown that the relationship between L1 and L2 fluency did not differ for English and Turkish while other studies discovered the opposite (Derwing et al., 2009).
The most recent study was conducted by Dr. Cox and Dr. Baker-Smemoe of Brigham Young University (under review). In their study, they attempted to look more closely at the relationship between L1 and L2 fluency by examining speech samples of over 200 non-native speakers of English. The participants in the study were speakers of 20 different languages with main native languages being Korean, Spanish, Chinese and Portuguese. The participants were asked to take a computer-administered speaking test in both L1 and L2. The speech samples were then analyzed by means of Praat to identify mean length or run, number or pauses and speech rate. The results were then compared between L1 and L2 across different languages and proficiency levels. The results showed a strong relationship between L1 and L2 fluency features, and that these temporal features differed across different L1s. This indicates that the relationship between L1 and L2 proficiency is important to keep in mind when assessing L2 proficiency. The results did not show, however, that the correlations between L1 and L2 fluency features differed across different proficiency levels, suggesting that L2 fluency measures may be measuring not only the developmental state of the L2 system, but also a trait of the speaker (as one who speaks, for example, at a certain rate regardless of the language spoken). Although this study examined native speakers of many different L1s (Portuguese, Spanish, Korean and Chinese among them) learning L2, the current study is unique because it examines some of the L1-L2 language combinations that have not been explored before. The current study expands on the Cox and Baker-Smemoe (under review) study by not looking at speakers of different L1s (Japanese, Mandarin Chinese, Portuguese, Spanish and Russian) learning one L2 (English), but also different speakers of one L1 (English) learning different L2s (Japanese, Mandarin Chinese, Portuguese, Spanish and Russian). In addition, the current study will examine Japanese, which has not been explored as much as some of the other languages.
Thus, although some studies have attempted to look more closely at fluency in L1 and L2 (Derwing et al., 2009; Riazantseva, 2001; Tavakoli, 2011), very few studies have focused on the relationship of L1 fluency and L2 fluency across different proficiency levels and different languages (Baker-Smemoe et al., under review; Cox & Baker-Smemoe, under review; de Jong et al., 2012).

The Present Study: The Influence of L1 Fluency on L2 Fluency

As speaking a second language “fluently” has become one of the most desirable goals of an L2 leaner, fluency became one of the most researched topics in linguistics (Tavakoli, 2011). However, what “fluency” actually means is still a subject of discussion within the linguistic community (Kormos & Dénes, 2004; Chambers, 1997; Freed, 2000). Fluency can be described in many ways. In its broader sense one of the definitions characterize fluency as “global oral proficiency” (Tavakoli, 2011). In its narrower sense, however, fluency “usually refers to the best use of time constraints when speaking or to an uninterrupted stream of smooth and hesitation-free speech” (Tavakoli, 2011). In this study we will refer to fluency in its narrower sense, i.e. speech characterized by speech rate, number of pauses, length of pauses, and mean length of run).

Even though a lot of research has been done on what fluency is, very little comparative research has been done on how to identify the relationship between L1 and L2 fluency, and how fluency differs across languages and different proficiency levels (Baker-Smemoe et al., under review; Cox & Baker-Smemoe, under review). Many questions that could contribute a lot of valuable knowledge to this topic are still unanswered.

The following research questions guide the current study:
1. What is the relationship between temporal fluency features (i.e., speech rate, number of pauses, and mean length of run) in the L1 and L2?

2. Does the relationship between L1 and L2 temporal fluency differ at different L2 proficiency levels (as measured by the ACTFL scale)?

3. Do L2 speakers of different languages achieve different fluency levels at the same oral proficiency level (as measured by the ACTFL scale)? In other words, do intermediate L2 speakers of Spanish have a faster speech rate (for instance) than intermediate L2 speakers of Russian? Can these differences be explained by differences in the average speech rates of native speakers of those languages?

My study proposes to explore these questions and provide valuable answers that would help language teachers to be better at teaching and assessing fluency and overall language proficiency. In addition, the answers to these questions will also help better understand and more accurately describe fluency, and see how exactly L1 fluency differs from L2 fluency, and what can be done to help a second language learner to develop better fluency in L2 (Tavakoli, 2011).
CHAPTER THREE
METHODOLOGY

Introduction

The methodology of this study is be discussed in this chapter. The chapter begins with the description of participants involved in the study. The next section of the chapter reviews the demographics and language background questionnaire. The third section describes the instrument used in the study. The last section, in turn, discusses how the data were collected and analyzed.

Participants

The study took place in Provo, Utah (United States). All of the research subjects were residing in Utah at the time of recordings. The majority of participants were Brigham Young University students. Both native and non-native English speakers participated in the study. As part of the study all of the participants agreed to the Informed Consent form (see Appendix C for Informed Consent Form) and filled out a questionnaire about their language background, demographics, and experience in the languages they speak (see Appendix B for Questionnaire).

Questionnaire

All of the participants were asked to provide basic demographic information, such as age, gender, place of birth, native language; additional languages spoken, how they were learned, age of second language acquisition, how the second language was learned and how much it was used with friends, at school, work, church, at home and overall, and the level of proficiency participants rated themselves at on a scale from 1 to 10 (with 10 being “native-like”). (See Appendix B for complete questionnaire.)
Demographics

The total number of participants in the study is 70, 34 females and 36 males. Their average age was 24.1 years old. Table 1 presents more detail by language groups.

Table 1

Number, Language, Age, and Gender of Participants

<table>
<thead>
<tr>
<th>Language</th>
<th>Number</th>
<th>Average Age</th>
<th>Male/Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japanese</td>
<td>5</td>
<td>26.2</td>
<td>1/4</td>
</tr>
<tr>
<td>Mandarin</td>
<td>5</td>
<td>25.2</td>
<td>0/5</td>
</tr>
<tr>
<td>Portuguese</td>
<td>5</td>
<td>25</td>
<td>1/4</td>
</tr>
<tr>
<td>Russian</td>
<td>5</td>
<td>28.6</td>
<td>0/5</td>
</tr>
<tr>
<td>Spanish</td>
<td>5</td>
<td>24.2</td>
<td>2/3</td>
</tr>
<tr>
<td>Total/Average</td>
<td>25</td>
<td>25.8</td>
<td>4/21</td>
</tr>
</tbody>
</table>

Second language acquisition questions

About 37% of all participants spoke a third language or more languages to some degree (40% of all the native speakers and 35.5% of all the non-native speakers reported they spoke another language besides the languages they were tested in). More demographics data are discussed below.

Non-native (native English) Speakers

The non-native speakers were drawn from a pool of BYU students over the course of two years. The first students were invited to participate in the study during Winter semester of 2011.
The last data for non-native speakers were obtained during Winter semester 2013. For the purpose of this study all of the non-native speakers were required to have taken the Official ACTFL Oral Proficiency Interview in their second language. Thus, only students enrolled in capstone language courses were invited to participate. Students enrolled in these courses are required to take an OPI as part of the capstone class, so no additional arrangements for OPIs had to be made. Therefore, the subjects in the study were drawn from Japanese 495, Chinese Mandarin 495, Portuguese 493, Spanish 493, and Russian 492. The students were invited to participate in the study in the form of announcements during class and/or by email. As a reward for participation, the students were offered 10 dollars in cash. The first few students, however, whose samples were taken during Winter semester 2011, were offered 5 dollars in cash, but this reward was raised to 10 dollars later due to insufficient interest in participating in the study. The total number of non-native speakers who participated in the study is 45: 13 Spanish speakers (5 female and 8 male), 9 Russian speakers (2 female and 7 male), 8 Portuguese speakers (3 female and 5 male), 8 Japanese speakers (all male), and 7 Chinese Mandarin speakers (3 female (one considered herself functionally bilingual in English and Mandarin) and 4 male). We did not have the OPI data for 5 of the non-native speakers (3 of them were bilingual and the other two did not provide their OPI data), so they were not included in any of the statistics ran where the OPI data was considered. The average age of the non-native language participants was 24.4 years old. (See Table 1).

Due to the fact that the majority of non-native speakers were enrolled in BYU capstone courses, their level of ACTFL proficiency ranged between Intermediate Mid to Superior.

Most of the participants in the non-native group (the native English speakers group) started learning their L2 after the age of 15. Only 8 people out of 45 started learning their L2
before the age of 15 (not considering the bilingual speaker). The majority of the group had learned their L2 at the age of 19. This can be explained by the fact that a lot of the participants are BYU students who have gone to another country to serve a full-time proselyting mission for the Church of Jesus Christ of Latter-Day Saints at the age of 19 or 21. This was when many of them started learning their L2 (see Table 2).

The average time spent learning L2 for the whole group was 5.6 years (std(X) = 2.89) with 5.9 years for Japanese (std(X) = 1.05), 7 for Mandarin (std(X) = 4.17), 5.1 for Portuguese (std(X) = 2.1), 4 for Russian (std(X) = 1.15), and 6.1 years for Spanish (std(X) = 3.5) (see Table 3.2).

Table 2

<table>
<thead>
<tr>
<th>Language</th>
<th>Age Started Studying</th>
<th>Years Studying</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average</td>
<td>Standard Dev</td>
</tr>
<tr>
<td>Japanese</td>
<td>11.2</td>
<td>3.2</td>
</tr>
<tr>
<td>Mandarin</td>
<td>9.6</td>
<td>3.1</td>
</tr>
<tr>
<td>Portuguese</td>
<td>15.0</td>
<td>5.5</td>
</tr>
<tr>
<td>Russian</td>
<td>11.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Spanish</td>
<td>12.6</td>
<td>5.2</td>
</tr>
<tr>
<td>Total/Average</td>
<td>11.9</td>
<td>4.5</td>
</tr>
</tbody>
</table>

L2 Speakers

<table>
<thead>
<tr>
<th>Language</th>
<th>Age Started Studying</th>
<th>Years Studying</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average</td>
<td>Standard Dev</td>
</tr>
<tr>
<td>Japanese</td>
<td>16.3</td>
<td>3.7</td>
</tr>
<tr>
<td>Mandarin</td>
<td>15.3</td>
<td>5.3</td>
</tr>
<tr>
<td>Portuguese</td>
<td>18.3</td>
<td>4.8</td>
</tr>
<tr>
<td>Russian</td>
<td>19.1</td>
<td>0.9</td>
</tr>
<tr>
<td>Spanish</td>
<td>17.9</td>
<td>2.8</td>
</tr>
<tr>
<td>Total/Average</td>
<td>17.5</td>
<td>3.9</td>
</tr>
</tbody>
</table>
The average number of months spent in conversation classes in the non-native group was 6.7, on pronunciation – 7.5, on writing – 10, on culture – 8.5, and on grammar – 10.8 months. (See Table 3).

Table 3

*Average Months Spent on Learning Conversation, Pronunciation, Writing, Culture, and Grammar in Formal Class Setting*

<table>
<thead>
<tr>
<th>Language</th>
<th>Conversation</th>
<th>Pronunciation</th>
<th>Writing</th>
<th>Culture</th>
<th>Grammar</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 Speakers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japanese</td>
<td>14.8</td>
<td>11.6</td>
<td>13.2</td>
<td>2.2</td>
<td>39.4</td>
</tr>
<tr>
<td>Mandarin</td>
<td>16.0</td>
<td>15.6</td>
<td>26.8</td>
<td>7.2</td>
<td>44.0</td>
</tr>
<tr>
<td>Portuguese</td>
<td>17.4</td>
<td>12.8</td>
<td>15.8</td>
<td>8.0</td>
<td>11.0</td>
</tr>
<tr>
<td>Russian</td>
<td>9.2</td>
<td>4.0</td>
<td>9.8</td>
<td>2.4</td>
<td>14.0</td>
</tr>
<tr>
<td>Spanish</td>
<td>12.0</td>
<td>8.0</td>
<td>8.4</td>
<td>8.0</td>
<td>7.1</td>
</tr>
<tr>
<td>Total/Average</td>
<td>13.9</td>
<td>10.4</td>
<td>14.8</td>
<td>5.6</td>
<td>23.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Language</th>
<th>Conversation</th>
<th>Pronunciation</th>
<th>Writing</th>
<th>Culture</th>
<th>Grammar</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2 Speakers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japanese</td>
<td>13.4</td>
<td>17.1</td>
<td>19.4</td>
<td>16.6</td>
<td>17.4</td>
</tr>
<tr>
<td>Mandarin</td>
<td>8.1</td>
<td>5.1</td>
<td>8.9</td>
<td>4.3</td>
<td>7.6</td>
</tr>
<tr>
<td>Portuguese</td>
<td>3.9</td>
<td>4.3</td>
<td>6.1</td>
<td>6.1</td>
<td>6.7</td>
</tr>
<tr>
<td>Russian</td>
<td>3.6</td>
<td>4.1</td>
<td>5.6</td>
<td>4.8</td>
<td>11.4</td>
</tr>
<tr>
<td>Spanish</td>
<td>5.6</td>
<td>7.3</td>
<td>10.2</td>
<td>10.1</td>
<td>10.8</td>
</tr>
<tr>
<td>Total/Average</td>
<td>6.7</td>
<td>7.5</td>
<td>10.0</td>
<td>8.5</td>
<td>10.8</td>
</tr>
</tbody>
</table>

The average time spent on speaking L2 for the non-native group at home was 17%, at school – 36.8%, at work – 13%, at Church – 12%, with friends – 23%, and overall – 24%. The percentage of time spent on L2 in the non-native group was considerably lower than that in the native group. This can be explained by the fact that the native language participants (the non-native English speakers) lived in an English speaking country (the United States) and therefore
had more opportunity to practice their L2, whereas the non-native participants had fewer opportunities to do so (See Table 3).

Table 4

*Average Time Spent on Speaking L2 at Home, at Church, at Work, at School, with Friends, and Overall Given in Percent*

<table>
<thead>
<tr>
<th>Environment</th>
<th>L1 Speakers</th>
<th>L2 Speakers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Avg. Time Spent</td>
<td>Avg. Time Spent</td>
</tr>
<tr>
<td>Home</td>
<td>50.80%</td>
<td>17.07%</td>
</tr>
<tr>
<td>Church</td>
<td>76.88%</td>
<td>12.07%</td>
</tr>
<tr>
<td>Work</td>
<td>62.11%</td>
<td>13.42%</td>
</tr>
<tr>
<td>School</td>
<td>86.84%</td>
<td>36.83%</td>
</tr>
<tr>
<td>Friends</td>
<td>53.00%</td>
<td>23.17%</td>
</tr>
<tr>
<td>Overall</td>
<td>68.80%</td>
<td>24.27%</td>
</tr>
</tbody>
</table>

The average rating for the participants’ L2 knowledge that they gave themselves was 7.14.

*Native Speakers*

The non-native English participants (the native speakers of the languages examined in this study) were also mainly either Brigham Young University or Brigham Young University’s English Language Center students. They were invited to participate personally by email or word of mouth. They were not offered any reward for their participation beforehand, due to the legal restraints concerning international students. Some of them, however, received fruit as a “thank you.” The total number of native speakers who participated in the study was 25: 5 Spanish speakers (2 male and 3 female (1 of them considered herself functionally bilingual in Spanish and English)), 5 Russian speakers (all female), 5 Portuguese speakers (1 male and 4 female), 5 Japanese speakers (1 male and 4 female), and 5 Mandarin speakers (all female). Their age ranged
between 19 and 35 (See Table 1). Twenty participants out of 25 started learning English before the age of 15 with the earliest age of learning being 5 and latest being 23 (not considering the bilingual speaker who learned both languages at birth). Most of the participants started learning English at school in their own countries, and only one participant started learning English upon her arrival to the United States (see Table 2).

The average time spent on learning English overall for all the native speakers was 12.08 years (std(X) = 5.25) with the average of 11 years for native Japanese speakers std(X) = 4.82), 15.2 years for native Mandarin speakers (std(X) = 5.67), 8.8 for native Portuguese speakers (std(X) = 4.07), 16 years for native Russian speakers (std(X) = 2.90), and 9.4 years for native Spanish speakers (std(X) = 3.67) (see Table 2).

Most of the participants reported having to take classes in their L2. 13.9 months was reported to have been spent on conversation classes, 10.4 months on pronunciation, 14.8 months on writing, 5.6 months on culture, and 23.1 months on grammar (See Table 4).

The average rating that the native participants gave themselves for overall English language knowledge was 7.16 out of 10.

The average time spent on speaking English as L2 at home for this group was 50.8%, at school – 86.8%, at work – 62.1%, at church – 76.9%, with friends – 53%, and overall – 68.8% of the time (see Table 4).

Instrument

The instrument consisted of one question and one picture prompt for each L1 and L2 resulting in two L1 and two L2 oral samples in total. For this study it was decided to use questions and picture prompts because they both provide spontaneous speech at the same time controlling for the content, and approximate proficiency level of speech production. All of the
picture prompts and questions were distributed on paper (See Appendix C and D). The participants were first asked to answer one of the two offered questions and then proceed to the picture prompt task. All of the participants were asked to respond in English first and then in their native or second language. Thus, about 2/3 of the participants (45 total) completed their first task in their L1 (English) and then in L2; and 1/3 of the participants (25 total) completed their first task in their L2 (English) and then in their native language (Japanese, Chinese Mandarin, Russian, Portuguese or Spanish). Because all of the questions and picture prompts were different, the order in which the participants completed their task in would most likely have little to no effect on the participants’ oral performance.

Questions

The questions required production of a spontaneous response, and were open-ended questions that encouraged participants to provide argumentation for their answers. For instance, one of the questions asked participants to give advice to their friend who is trying to decide whether she should accept a summer job after graduation or not (see Appendix C for Questions for English, and Appendix D for Questions for native language/L2).

Picture prompts

The picture prompts also differed for L1 and L2. The first picture prompt for L1 presented an image of young people at birthday party (see Appendix C). In a short prompt before the picture the participants were asked to describe a birthday party in America to their foreign friend who had never been to an American birthday party before. The image was offered to the participants as a help tool to gather ideas for their answer.

The second picture prompt for L2 consisted of a set of six frames that represented six different house chores (see Appendix D). In the prompt before the picture the participants were
asked to tell a friend why they are not able to meet for a study group (their friends are coming to visit out of town and they have to prepare to receive them). The images in the picture are intended to help them with ideas while giving the answer.

**Data collection**

In order to collect speech samples necessary for the project, the participants were asked to record themselves speaking. The samples were recorded on the computer by means of free software called Audacity. Audacity lets users record sound and transform it into a desired format. All of the samples were saved in WAV format for later analyses. Most of the data for non-native speakers were recorded in a BYU Apple computer lab where participants came to record themselves. Since many participants had never used Audacity or an Apple computer before, they were shown how to record themselves prior to the recordings. They were then free to start whenever they pleased and were in control of their own time. Since at times there were several participants recording at the same time, there was a slightly higher level of noise and possible discomfort related to that, but it did not affect the participants’ speech samples. Most of the native speakers’ data were collected by means of a personal Apple laptop that belonged to the author.

After the students were shown how to use the software and the Apple computers, they were then explained what they were supposed to say. The participants were asked to record themselves speaking in two languages. After recording two answers in English, the participants proceeded to answer the next two questions in their L2 or native language. Everyone was encouraged to speak for about 1 minute to 1.5 minutes for each answer. However, the participants were in control of their own time and sometimes went under or over the proposed time limit. There were no samples that were significantly shorter than the proposed length,
however, those samples that were significantly longer (by a minute or more) were cut to fit the proposed length before they were analyzed.

**ACTFL Oral Proficiency Interviews**

The level of participants’ L2 was obtained through the Center for Language Studies at Brigham Young University, which courteously provided the records for OPI scores of students who participated in the current study. As it has been mentioned earlier, only those students that have taken the OPIs (provided by the Center for Language Studies) as part of their capstone classes were invited to participate.

The Oral Proficiency Interview (OPI) is a type of assessment of a speaker’s language ability. It was designed by the American Council on the Teaching of Foreign Languages (ACTFL) and is widely used in academics, in government agencies and in the private sector. Unlike some of the other language tests, OPI measures a learner’s *functional* speaking ability, or the ability of a speaker to function effectively in real-life situations. It is important to mention that the OPI is a criterion-referenced test. This means that it is not designed to assess a speaker’s language skill based on a particular course or curriculum content. Rather, it is a test designed to measure learner’s overall speaking ability. In other words, the ACTFL OPIs focus on what the speaker *can* do with language, rather on what the speaker *cannot* do. This assessment is done by conducting a structured 10- to 30-minute conversation between a certified interviewer and a language learner. During the interview, the interviewer carefully observes the interviewee’s ability to carry out global tasks (from enumerating to such complex tasks as expressing your opinion through hypothesis), to show the extent of content and context domains (ability to perform in formal or informal settings and cover different topics), to show accuracy and
comprehensibility (how well a speaker is understood), and demonstrate the ability to organize speech (from words to phrases at the Novice level to extended discourse at the Superior level).

According to the ACTFL rating scale, there are five major levels of language performance: Novice (communication is minimum by means of rote utterances and words), Intermediate (can create with language and handle simple conversation), Advanced (can narrate and describe), Superior (can hypothesize and discuss concrete and abstract topics), and Distinguished (highly proficient and highly articulate speakers whose speech is sophisticated, succinct, filled with cultural references and resembles written discourse).

All of the major levels besides Superior and Distinguished levels are also divided into three sublevels (low, mid and high), which basically define how “comfortable” a speaker is at that particular level. Thus, language learners that are not able to consistently show their ability to sustain some of the functions of the Intermediate level, but are able to perform all of the functions of the Novice level, these speakers will be rated at the Novice-High level.

ACTFL OPIs have consistently shown their reliability in assessing overall oral proficiency in over 19 languages (Henning, 1992; Surface & Deirdorff, 2003; Thompson, 1995) and serve the purpose for the current study.

Data analyses

After the data was collected, the tracks were then broken down into two parts – the native and the L2 sections. This resulted in two independent tracks per each participant (one in L1 and one in L2). Each segment was then checked for quality of sound making sure there was no noise because this could affect the quality of analyses when the tracks are run in Praat script. This was done manually, listening to each single track in Audacity, a computer audio recorder and editor. While checking the tracks for sound quality, they were also checked for track duration. It was
decided that each response should not take less than 30 seconds and no more than 1.5 minutes in length. There were no short tracks, and those tracks that were longer than 1.5 minutes were cut to fit the set length. The tracks were then saved in WAV format for further analyses.

The segments were then analyzed for rate of speech, number of pauses and mean length of run using the Praat script developed and described in de Jong and Wempe, 2009. In order to determine speech rate, the Praat script first identifies the syllable nuclei (which is the central part of a syllable and is most commonly represented by a vowel). This helps calculate the number of syllables, which are then used to determine speech rate (which is essentially, the number of syllables per second) (de Jong & Wempe, 2009). Pauses are represented as “any length of silence over 250 ms” (Cox & Baker-Smemoe, under review) and are identified as the number of pauses per second. Mean length of run is identified by the average number of syllables produced between pauses (Cox & Baker-Smemoe, under review).

Statistical Analyses

To analyze the data that was collected and computed by means of Praat, several different statistical analyses were used. All of the data were checked and were found to be normally distributed.

In order to determine whether there was a relationship between L1 and L2 temporal features of the same speaker (Question 1), the data were compared using bivariate Pearson correlations for each of the temporal measures (MLR, speech rate, number of pauses) for L1 and L2 separately.

Then the study proceeded to analyze whether this relationship differed at different L2 proficiency levels. Due to the insufficient amount of speakers for each proficiency level, all of
the languages were divided into two major groups – a low proficiency group and a high proficiency group. Also, because we did not have the data on proficiency for the native speakers in their L2 (English), we excluded them from this analysis. In order to find whether there was a relationship between L1 and L2 temporal fluency measures at different proficiency measures, we also ran bivariate Pearson correlations on each of the measures for each proficiency group. We further compared the data by running a series of one-way ANOVAs in order to identify whether there was a significant difference between the L1 and L2 fluency measures between the low and the high proficiency levels.

Lastly, in order to determine how the L1 and L2 affect the L1/L2 fluency relationship, we first ran a series of one-way ANOVAs to see whether the native speakers differed in their speech rate, MLR and number of pauses in their native languages. We then ran one-way ANOVAs to identify whether there the non-native speakers differed in terms of their proficiency. And lastly, we ran bivariate Pearson correlations in order to see whether the relationship between L1 and L2 temporal fluency measures differed in terms of proficiency with respect to the L2 (homogeneity of variance was checked for all ANOVAs).

**Conclusion**

This chapter discusses the methodology of the current study explaining how the study was conducted. This chapter first describes the participants and the instrument used in the study. It then describes how the data was collected and analyzed. The results of the current study are discussed in Chapter Five following the current section of the study.
CHAPTER FOUR

RESULTS

The purpose of this study was to see whether there is a relationship between L1 and L2 fluency and how this relationship changes across different languages and different proficiency levels. Specifically, the study focused on temporal features (mean length of run, number of pauses and speech rate) of one L2 (English) and five L1s (Russian, Spanish, Portuguese, Japanese and Mandarin Chinese). The results from Chapter Three are discussed in this chapter.

In order to answer these questions, the results were calculated by means of several statistical analyses. To analyze some results Pearson correlations were used, while question 3 and part of question 2 were analyzed using a series of one-way ANOVAs. More detail about these analyses is given in the order of the presented questions above – i.e., the chapter addresses question 1 first which then is followed by questions 2 and 3.

Research Question 1

What is the relationship between temporal fluency features (i.e., speech rate, number of pauses, and mean length of run) in the L1 and L2?

The main focus of this study was to determine whether there is a relationship between L1 and L2 fluency measures. In order to answer this question, the mean length of run, speech rate and number of pauses of a particular speaker in his/her L1 were compared to the same temporal fluency measures in his/her L2. However, we first needed to find these measures. This was done by means of Praat, which helped us identify the number of pauses and the number of syllables (which was then used to calculate speech rate and MLR).
The scores of all the non-native and native speakers of each of the six (English included) languages were included in the analysis. The average scores for each of these measures are given in Table 5 below. These measures demonstrate that the participants had a faster speech rate, fewer pauses, and a longer mean length of run in their native language versus their second language.

Table 5

*The Average syllables per second (speech rate), number of pauses and mean length of run for all of the native languages and non-native languages with standard deviation included in parentheses.*

<table>
<thead>
<tr>
<th>Language</th>
<th>Speech Rate</th>
<th>Number of Pauses</th>
<th>Mean Length of Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>3.29 (.52)</td>
<td>.287 (0.073)</td>
<td>12.58 (5.51)</td>
</tr>
<tr>
<td>L2</td>
<td>2.87 (.45)</td>
<td>.35 (.088)</td>
<td>8.93 (3.37)</td>
</tr>
</tbody>
</table>

We ran bivariate Pearson correlations on each of the measures to determine the relationship between L1 and L2 fluency measures and these scores are given in Table 6 below.

Table 6

*Bivariate Pearson Correlations on speech rate, number of pauses and mean length of run*

<table>
<thead>
<tr>
<th>Temporal feature</th>
<th>L1 Speech Rate</th>
<th>L1 number of pauses</th>
<th>L1 mean length of run</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2 speech rate</td>
<td>.613**</td>
<td>-.341**</td>
<td>.497**</td>
</tr>
<tr>
<td>L2 number of pauses</td>
<td>-.199</td>
<td>.711**</td>
<td>-.558**</td>
</tr>
<tr>
<td>L2 mean length of run</td>
<td>.394**</td>
<td>-.635**</td>
<td>.668**</td>
</tr>
</tbody>
</table>

**p<.001

As demonstrated in Table 6, correlations between L1 and L2 temporal measures are quite strong. L1 and L2 speech rate are correlated at .613, L1 and L2 pauses at .711, and L1 and L2
mean length of run at .668. In other words, these results suggest that the relationship between the different measures in L1 and L2 is quite strong.

Research Question 2

Does the relationship between L1 and L2 temporal fluency differ at different L2 proficiency levels (as measured by the ACTFL scale)?

Because there were too few speakers at each proficiency level, the participants were divided into two major proficiency levels – low (from Intermediate-Mid to Advanced-Low) and high (from Advanced-Mid to Advanced-High). Due to the relatively low number of speakers in each proficiency level (only 1-2 L2 speakers for each proficiency level), we divided the speakers into two major proficiency groups as it is mentioned above. (See Table 7 for the descriptive statistics for both groups). For this analysis we excluded the native speakers of the languages because we did not have proficiency data for them in their L2 (English). We ran bivariate Pearson correlations on each of the measures for each proficiency level (low and high) separately.

Table 7

The number of speakers and OPI proficiency levels per each L2 in higher and lower proficiency groups

<table>
<thead>
<tr>
<th>L2</th>
<th>Lower Proficiency Group</th>
<th>Higher Proficiency Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IM</td>
<td>IH</td>
</tr>
<tr>
<td>Japanese</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Mandarin</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Portuguese</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Russian</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Spanish</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>
The results for the low proficiency group are shown in Table 8 below.

Table 8

_Bivariate Pearson correlations on speech rate, number of pauses and mean length of run for lower proficiency group (Intermediate-Mid to Advanced-Low)_

<table>
<thead>
<tr>
<th>Temporal feature</th>
<th>L1 Speech Rate</th>
<th>L1 number of pauses</th>
<th>L1 mean length of run</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 Speech Rate</td>
<td>1</td>
<td>-0.357</td>
<td>0.603**</td>
</tr>
<tr>
<td>L1 number of pauses</td>
<td>-0.357</td>
<td>1</td>
<td>-0.906**</td>
</tr>
<tr>
<td>L1 mean length of run</td>
<td>0.603**</td>
<td>-0.906**</td>
<td>1</td>
</tr>
<tr>
<td>L2 speech rate</td>
<td>0.517**</td>
<td>0.206</td>
<td>0.035</td>
</tr>
<tr>
<td>L2 number of pauses</td>
<td>-0.111</td>
<td>0.721**</td>
<td>-0.682**</td>
</tr>
<tr>
<td>L2 mean length of run</td>
<td>0.423</td>
<td>-0.460*</td>
<td>0.603**</td>
</tr>
</tbody>
</table>

**p<.001

As we can see from Table 8, the correlations between L1 and L2 temporal measures for the low proficiency group are also quite strong. L1 and L2 mean length of run is correlated at 0.603, L1 and L2 number of pauses at 0.721, and L1 and L2 MLR is correlated at 0.517.

The same analysis was done for the high proficiency group and is shown in Table 9 below.

Table 9

_Bivariate Pearson correlations on speech rate, number of pauses and mean length of run for lower proficiency group (Advanced-Mid to Advanced-High)_

<table>
<thead>
<tr>
<th>Temporal feature</th>
<th>L1 Speech Rate</th>
<th>L1 number of pauses</th>
<th>L1 mean length of run</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 Speech Rate</td>
<td>1</td>
<td>-0.616**</td>
<td>0.784**</td>
</tr>
<tr>
<td>L1 number of pauses</td>
<td>-0.616**</td>
<td>1</td>
<td>-0.902**</td>
</tr>
<tr>
<td>L1 MLR</td>
<td>0.784**</td>
<td>-0.902**</td>
<td>1</td>
</tr>
<tr>
<td>L2 speech rate</td>
<td>0.676**</td>
<td>0.206</td>
<td>0.432*</td>
</tr>
<tr>
<td>L2 number of pauses</td>
<td>-0.184</td>
<td>0.598**</td>
<td>-0.547**</td>
</tr>
<tr>
<td>L2 MLR</td>
<td>0.451*</td>
<td>-0.222</td>
<td>0.651**</td>
</tr>
</tbody>
</table>

**p<.001. *p<.005
As demonstrated in Table 9, L1 and L2 mean length of run for the high proficiency group is correlated at .651, L1 and L2 number of pauses is correlated at .598, and L1 and L2 speech rate is correlated at .676.

These correlations demonstrate that the relationship between L1 and L2 temporal fluency measures are quite strong for both levels of proficiency.

In order to identify the difference between the low and the high proficiency levels, we ran a series of one-way ANOVAs comparing the speech rate, the MLR and the number of pauses of both proficiency levels. We ran these analyses to determine whether there was a significant difference between the low and high proficiency groups in terms of their L1 and L2 fluency measures. Our dependent variable in these analyses was one of the fluency measures (L1 speech rate, MLR, pauses, L2 speech rate, MLR, pauses) and the independent variable was group (low or high proficiency). For each of these analyses, we did not find a difference between the low and high proficiency groups. In other words, the two proficiency levels did not differ from each other in terms of speech rate, MLR, or pauses in either the L1 and L2 (all F’s (1, 43) < 1.14, all p’s > .353, all $\eta^2_p$’s < .128).
Research Question 3

Do L2 speakers of different languages achieve different fluency levels at the same oral proficiency level (as measured by the ACTFL scale)? In other words, do intermediate L2 speakers of Spanish have a faster speech rate than intermediate L2 speakers of Russian? Can these differences be explained by differences in the average speech rates of native speakers of those languages?

The final research question sought to determine how native language and L2 may affect the L1/L2 fluency relationship. To answer this question, we first examined the difference between the non-native and native speakers’ production of speech rate, MLR and pausing in the L2. Table 10 below gives a comparison of the native speakers and non-native speakers of the languages examined in this study.

Table 10

*The average syllables per second (speech rate), number of pauses and mean length of run of native and non-native speakers for each language (standard deviations are included in parentheses)*

<table>
<thead>
<tr>
<th>Language</th>
<th>Native speaker speech rate</th>
<th>Native Speaker MLR</th>
<th>Native speaker pauses</th>
<th>Non-native speaker speech rate</th>
<th>Non-native Speaker MLR</th>
<th>Non-native speaker pauses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese</td>
<td>3.39 (0.34)</td>
<td>15.17 (7.04)</td>
<td>0.25 (0.08)</td>
<td>2.75 (0.36)</td>
<td>7.36 (2.57)</td>
<td>0.41 (0.09)</td>
</tr>
<tr>
<td>English</td>
<td>3.18 (0.48)</td>
<td>11.79 (4.18)</td>
<td>0.28 (0.06)</td>
<td>2.80 (0.47)</td>
<td>8.55 (3.24)</td>
<td>0.35 (.08)</td>
</tr>
<tr>
<td>Japanese</td>
<td>3.02 (.45)</td>
<td>9.13 (4.49)</td>
<td>0.36 (0.082)</td>
<td>2.73 (0.47)</td>
<td>7.22 (2.19)</td>
<td>0.39 (0.08)</td>
</tr>
<tr>
<td>Portuguese</td>
<td>3.43 (0.56)</td>
<td>12.09 (2.45)</td>
<td>0.28 (0.02)</td>
<td>3.04 (0.455)</td>
<td>9.95 (3.44)</td>
<td>0.32 (0.05)</td>
</tr>
<tr>
<td>Russian</td>
<td>3.62 (0.37)</td>
<td>12.12 (1.87)</td>
<td>0.30 (.02)</td>
<td>2.74 (0.26)</td>
<td>9.36 (3.31)</td>
<td>0.32 (0.09)</td>
</tr>
<tr>
<td>Spanish</td>
<td>3.88 (0.37)</td>
<td>19.23 (8.94)</td>
<td>0.23 (0.06)</td>
<td>3.15 (0.39)</td>
<td>10.69 (3.30)</td>
<td>0.31 (0.05)</td>
</tr>
</tbody>
</table>
We first ran a series of one-way ANOVAs to determine whether the native speakers differed in their speech rate, MLR and pauses across the 6 languages. We found the following. The six languages did differ in terms of speech rate ($F(5, 63) = 3.13, p = .014, \eta_p^2 = .199$). Post-hoc Tukey tests revealed that the Japanese native speakers had a significantly slower speech rate and the Spanish speakers had a significantly higher speech rate than speakers of the other languages. The other languages fell in between these two. Similar results were found for MLR ($F(5, 63) = 2.97, p = .018, \eta_p^2 = .19$), with the Japanese speakers having the lowest MLR, Spanish the highest, and the other languages in between. Finally, the analysis of pausing across the native speakers also revealed a significant difference between the languages ($F(5, 63) = 2.41, p = .046, \eta_p^2 = .161$). Post-hoc Tukey tests revealed that the Spanish native speakers used the smallest number of pauses than any other language, while Japanese native speakers used the highest number of pauses. All of the other languages fell between these two.

These results suggest that native languages differ in their average speech rate, MLR, and number of pauses, and also may suggest that the non-native speakers have different models for how quickly they should speak and how much they should pause. In our case, for instance, analyses revealed that at least two languages significantly differed in their L1 and L2 MLR. As we can see from Table 10, the MLR of the native speakers of Spanish was almost double that of non-native speakers of Spanish (19.23 (8.94) vs. 10.69 (3.30), while Chinese Mandarin is more than double that of the non-native speakers of Chinese Mandarin (15.17 (7.04) vs. 7.36 (2.57)). This means that both Spanish and Chinese Mandarin non-native speakers should be speaking for longer periods of time between pauses to sound more native-like. Thus, non-native speakers could greatly benefit from paying attention to such patterns in their respective L2s.
We next examined whether the non-native speakers differed from each other in their production of their respective native languages. In doing so, we first determined whether the non-native groups differed in terms of proficiency ability. We ran a series of one-way ANOVAs with the fluency measures as the dependent variable (the scores were changed to a numerical scale) and L2 language (Chinese, Japanese, Portuguese, Russian, Spanish) as the independent variable. We did not include those with English as their L2 in this analysis because we did not have their proficiency levels. This analysis revealed that there was no difference in proficiency across the five language groups in their L2 (F(4,41) = 1.38, p = .259, \( \eta^2 = .130 \)) – all of the languages averaged around an Advanced-Low-Advanced-Mid level.

Next, we ran a similar series of one-way ANOVAs with L2 speech rate, MLR, and number of pauses across the non-native speaker groups and found no differences (all F’s < 1.88, all p’s > .11, all \( \eta^2 \)'s < .13. Thus, we did not find that there was a difference in the groups in terms of their proficiency level – we did not find that an advanced L2 speaker of Chinese had a slower speaking rate in Chinese than did an advanced L2 speaker of Spanish in Spanish. This result allowed us to assume that any differences in speech rate, MLR and number of pauses would not be related to proficiency level, but to the L2 that they speak. This is especially noteworthy, since analyses revealed that the non-native speakers did not differ in terms of proficiency in their respective non-native languages.

We then ran statistics to see whether the relationships between L1 and L2 temporal fluency measures differed by the L1-L2 combination examined. The L1-L2 correlations of different temporal measures by L1-L2 combination are listed in Table 11.
Table 11

*L1-L2 fluency relationship by language*

<table>
<thead>
<tr>
<th>L1-L2</th>
<th>L1-L2 speech rate correlations</th>
<th>L1-L2 MLR correlations</th>
<th>L1-L2 pausing correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>English-Japanese</td>
<td>.739*</td>
<td>.688*</td>
<td>0.089</td>
</tr>
<tr>
<td>English-Chinese</td>
<td>.826*</td>
<td>.915*</td>
<td>0.31</td>
</tr>
<tr>
<td>English-Portuguese</td>
<td>.824*</td>
<td>.964*</td>
<td>0.557</td>
</tr>
<tr>
<td>English-Russian</td>
<td>0.388</td>
<td>0.287</td>
<td>.783*</td>
</tr>
<tr>
<td>English-Spanish</td>
<td>.731**</td>
<td>.652*</td>
<td>.790**</td>
</tr>
</tbody>
</table>

* = p < .05. ** = p < .01

While we found strong correlations on all of the fluency measures for the Spanish group, not all of the languages demonstrated the same pattern. Thus, Portuguese, for example resembled Spanish in similar MLR and speech rate correlations, but failed to show statistical results in the number of pauses. This, however, may be explained by an insufficient number of participants, because other studies have shown opposite results (Cox & Baker-Smemoe, under review). It is also interesting that both Japanese and Chinese languages demonstrated high correlations for MLR and speech rate, while the L1-L2 pausing correlations were extremely low. Another interesting result was observed in L1-L2 MLR and speech rate correlations of Russian. While L1 and L2 relationship in regards to the number of pauses was high, such relationship in MLR and speech rate was not significant.

**Conclusion**

The results of the current study showed that the correlations between L1 and L2 fluency features are quite strong, suggesting that fluency is as much of a trait as it is a state and that achieving higher levels of fluency is possible but may be dependent on our cognitive processing abilities (such as access fluidity and access control).
It was also found that the L1-L2 fluency relationship stays the same at all the proficiency levels among the five languages examined, supporting the view that L2 fluency is as much a trait as it is a state. Thus, these results indicate that no matter what proficiency level the speakers reach, the individual characteristics of L1 fluency will affect L2 fluency. That is, if a speaker is naturally slow in his L1, he/she will most likely carry this trait to his/her L2 and will speak slower than other speakers of the same level. These individual differences should be accounted for when assessing L2 fluency and overall oral proficiency in order to give such speakers accurate ratings.

Our final question attempted to see whether L2 speakers differ in their fluency measures at the same proficiency level across different languages and how these differences can be explained. After examining MLR, speech rate and number of pauses of the native speakers across different languages (L1s), it was found that some of the languages did differ in temporal fluency production. For example, the analysis showed that native Spanish speakers’ MLR and speech rate were significantly higher than in other languages, and native Spanish speakers also produced the smallest number of pauses. Native Japanese speakers, however, had the lowest MLR and speech rate, and the highest number of pauses. The other languages did not differ from each other in terms of these fluency measures. Keeping in mind such differences in L1 and how they are followed by L2 speakers, may help language learners improve their L2 fluency.

In the second part of the last question we examined whether the non-native speakers achieve different fluency levels at the same proficiency levels and found no statistical differences. That is, we did not find that an Advanced speaker of Spanish spoke faster than an Advanced speaker of Japanese at the same proficiency level. These results suggest that speakers
may transfer their L1 norms to their L2 and that such individual differences should be taken into account in SLA, especially in assessment of oral proficiency.

For the last part of our final question we examined L1-L2 fluency relationship more closely, by looking at how it compared across different L1-L2 combinations. Although not all of the correlations were high, most of the correlations were found to be significant suggesting that considering L1 fluency in L2 fluency assessment may be important.

This and other findings from Chapter Four are further discussed in Chapter Five.
CHAPTER FIVE

CONCLUSION

The results discussed in Chapter Four are discussed in greater detail in this section of the study. The chapter first discusses the finding to the research question 1 and then proceeds to discuss the findings to questions 2 and 3.

The overall results of the study confirmed that there is a relationship between L1 and L2 temporal fluency measures. It was also found that the L2 one learns may affect the speaker’s L2 fluency. The speaker’s L2 proficiency, however, may not play such a significant role. The results and the implications of the current findings will be discussed further below.

Research Question 1

What is the relationship between temporal fluency features (i.e., speech rate, number of pauses, and mean length of run) in the L1 and L2?

The main focus of the study was to find whether there is a relationship between L1 and L2 fluency. In order to do this, the number of pauses, speech rate and MLR of speakers in their L1 were compared to the same temporal features of the same speakers in their L2. Our findings confirmed the findings of previous research studies – just as in previous studies (de Jong et al., 2012; Cox & Baker-Smemoe, under review) we also found significant correlations between L1 and L2 temporal fluency measures. Although the correlations between L1 and L2 fluency measures were slightly lower than in some previous studies (for instance, in our study the correlations were the following: .613 for speech rate, .711 for number of pauses and .668 for MLR vs. .83 for speech rate, .64 for number of pauses and .70 for MLR in Cox and Baker-Smemoe (under review)), they were still significant and demonstrated a strong relationship.
These findings confirm the suggestion of Derwing et al. (2009) that fluency is as much of a trait as it is a state. As Cox and Baker-Smemoe (under review) state, “L2 fluency features are more than just a reflection of the developmental ability to access L2 grammar and lexicon or the state of L2 development. Instead, these individual differences may also reflect differences in access fluidity and attention control in the first language as well as in the second language.” In other words, these results demonstrated that the ability to reach higher fluency levels in L2 may be possible, but it is dependent on our cognitive processing constraints (such as access fluidity and attention control) and not just on our knowledge of vocabulary or syntax (Segalowitz, 2007). Such knowledge is important because it sheds light onto what the possibilities are of a language speaker and may help us understand which parts of L2 fluency are related to “trait” and which to “state.” As Segalowitz (2007) states, “laboratory-based measures of cognitive fluency may be able to contribute to the broader study of SLA, and reciprocally, research addressing broader communicative issues in SLA may make important contributions to our understanding of how and under what conditions fluency develops” (p. 185).

Even though these results mirror those of earlier studies, their contribution is still important. Both de Jong et al. (2012) and Segalowitz (2010) have suggested that more research should explore the relationship between L1 and L2 fluency. Thus, although multiple studies have been conducted to examine the relationship between L1 and L2 fluency (Derwing et al., 2009; Riazantseva, 2001; de Jong et al., 2012), only a few studies compared L1 and L2 fluency measures of the same speakers (Cox & Baker-Smemoe, under review). It is important to compare temporal L1 and L2 fluency measures of the same speakers because of several reasons and these are discussed below.
First of all, such measures provide more reliable data in terms of accounting for individual differences of the participants. For example, two different learners of English are being tested for their proficiency level in English. One of the learners seems to speak a little slower and uses more pauses and hesitations in his/her speech affecting his/her fluency. Should this learner be rated at a lower proficiency level? However, the tester might not know that the learner that speaks a little slower in English is actually a naturally slower speaker in his/her L1, while the second learner naturally speaks fast and uses few pauses in his/her L1. It seems that these are individual traits that these particular learners hold. Should we then take this particular trait into account considering that it might be affecting L2 fluency? Segalowitz (2010) proposes that we should, suggesting to gather both L1 and L2 data of an individual speaker and to calculate corrected fluency measures in order to take into account L1 disfluencies. Summarizing Segalowitz (2010), de Jong et al. (2012) state, “If it is the case that such corrected scores of L2 fluency better reflect disfluences that L2 speakers exhibit because of L2-specific difficulties in formulating and articulating L2 speech, it follows that such corrected scores are better predictors of L2 proficiency than are the uncorrected measures of L2 fluency and found that the corrected measures of fluency were better predictors of L2 fluency” (p. 3). In fact, in their recent study de Jong et al. (2012) compared corrected and uncorrected measures of fluency and discovered that the stronger the relationship between L1 and L2 fluency measure, the better this measure could predict the L2 fluency behavior.

Second, taking L1 fluency into account is important when it comes to proficiency assessment and high-stakes testing. Cox and Baker-Smemoe (under review) propose that in an ideal situation where “the native language of the examinees is homogenous” and “the baseline fluency is constant,” ASR testing of L2 oral proficiency might work well. When speakers have...
different language backgrounds, however, such practice might not give accurate results. Taking into account the differences of Spanish and Mandarin learners of English examined by Pellegrino (2011), Cox and Baker-Smemoe (under review) propose that if “Mandarin and Spanish speakers were taking an ASR-scored speaking test in English, the differences in their English speech rate could be affected by their native language background.” This, in turn, may affect their overall proficiency ratings and result in a lower proficiency level for the Mandarin speakers since their speech rate was slower than that of the Spanish speakers.

Third, de Jong et al. (2012) and Segalowitz (2010) also proposed that the L1-L2 fluency relationship should be observed in more languages. Although some previous research studies have explored this relationship between several different languages (Riazantseva, 2001), English-French (Tom & Deawale, 2005), Slavic (Russian and Ukrainian)-English/Chinese Mandarin-English (Derwing et al., 2009), Turkish-Dutch and English-Dutch (de Jong et al., 2012), some of these studies involved only a few participants for some of the languages observed. In addition, the current study is unique in that it has examined fluency in L1s and L2 combinations that have not been examined before. For example, Cox & Baker-Smemoe (under review) examined a group with several different L1s (Spanish, Portuguese, Chinese, Korean) learning the same L2 (English). By contrast, the current study examined both speakers of one L1 (English) learning several different L2s (Spanish, Portuguese, Chinese, Japanese, and Russian) and several speakers on different L1s (Spanish, Portuguese, Chinese, Japanese, and Russian) learning one L1 (English). Interestingly, even given this large different in L1-L2 combinations, the strength of the L1-L2 relationship remained high. Such results suggest that results from earlier studies can be generalized to any L1-L2 combinations and strengthens the argument that these results are results of individual processing constraints of language, both L1 and L2.
In addition, the results of the current study are significant because most of the studies have looked only at one or two languages at a time (de Jong et al., 2012; Derwing et al. 2009; Riazantseva, 2001), while this study, along with the study by Cox & Baker-Smemoe (under review), is examining many different languages. For example, Cox and Baker-Smemoe (under review) examined only a few Japanese speakers and very few other studies (Smemoe et al., under review) involved Japanese. The present study adds to the current research in exploring both – the native speaker data and more data in some other, less explored languages (Japanese). It is important to examine many languages in the same study because different studies often use different methodologies while examining L1/L2 fluency relationship. For example, studies differ in how they define pausing, speech rate and other temporal fluency features, making comparisons across studies difficult if not impossible.

Research Question 2

Does the relationship between L1 and L2 temporal fluency differ at different L2 proficiency levels (as measured by the ACTFL scale)?

Our next finding confirmed that L1 and L2 fluency relationship did not differ at different proficiency levels. We found that for the lower proficiency group L1 and L2 MLR correlated at .603, L1 and L2 speech rate correlated at .517, and L1 and L2 number of pauses correlated at .721. For the higher proficiency group were the following: L1 and L2 fluency correlated at .651, L1 and L2 speech rate correlated at .676 and L1 and L2 number of pauses correlated at .598. All of these correlations were significant at p<.001. In addition, a series of one-way ANOVAs demonstrated that there was no difference between the higher and the lower proficiency group in terms of their L1 and L2 fluency measures.
These results indicate that, no matter what proficiency level a speaker achieved (higher or lower), the relationship between fluency measures in the L1 and L2 is still the same. Thus, a L2 speaker of Spanish will have a faster speech rate, fewer pauses and a smaller MLR at the more advanced level of language learning, but this relationship would still reflect the speaker’s L1 MLR, mean length of run and number of pauses, suggesting that there may be individual differences involved (Cox & Baker-Smemoe, under review). For instance, if a slower L2 speaker of Russian speaks slowly at a lower proficiency level, these individual differences will transfer to the more advanced proficiency level, and the slower speaker will still speak more slowly than some of his/her other peers even at advanced levels. Thus, according to our findings, L1 fluency affects L2 fluency no matter what level of proficiency we are looking at. In other words, these results strengthen the argument that L2 fluency is as much a trait as it is a state, since the relationship between the L1 and L2 stays quite similar regardless of proficiency level. Thus, these individual differences should be accounted for when measuring L2 fluency and overall oral proficiency. de Jong et al (2012), for instance, after examining L1 and L2 fluency in their study conclude, “that research into L2 speaking will benefit from utilizing corrected measures of L2 fluency by sampling both L1 and L2 speech” (p. 17).

It may be that this relationship differs if one were to look at L1/L2 fluency relationship over time. However, when Derwing et al (2009) did so, they found a weaker relationship between L1 and L2 fluency among Russian speakers and even more so among Mandarin speakers as they improved in proficiency. This, according to Derwing et al. (2009), indicates that the relationship between L1 and L2 fluency is complex and is not straightforward because it may be dependent on a variety of factors (e.g.: speakers’ proficiency levels and cognitive factors as
well as L1 structural properties). Thus, Derwing et al (2009) suggest that “on-going longitudinal research” is necessary to better understand this relationship.

However, Cox and Baker-Smemoe (under review) claim that Derwing et al.’s (2009) findings in regards to a weaker relationship between L1 and L2 fluency measures over time may be attributed to the fact that the amount of participants in the study conducted by Derwing et al. (2009) may not be generalizable because there were only 30 participants whose fluency was examined. They also claim that the definition of proficiency presented by Derwing et al (2009) in their study was slightly different, and therefore, resulted in less proficient levels than that of Cox and Baker-Smemoe (under review). Therefore, since Cox and Baker-Smemoe (under review) used the same instrument to measure the speakers’ proficiency levels, we can claim that this is true for the current study as well and that the participants in Derwing et al.’s study (2009) were less proficient by our measure. Thus, the current study is exploring different proficiency measures as well as different languages. In light of these findings, Cox and Baker-Smemoe (under review) suggest that “it might be beneficial to examine more fine-grained levels of proficiency (especially at lower levels) to determine if the L1-L2 fluency relationship changes in early stages of L2 acquisition as the L2 system becomes more automatized and controlled.” In either case, the results of this study, combined with those of Cox and Baker Smemoe (under review) suggest that such factors as Derwing et al (2009) hypothesize may affect the L1-L2 fluency relationship (proficiency, L1 and L2 structural differences) may not hold out as factors that affect this relationship since we found such differences did not affect this relationship.
Research Question 3

Do L2 speakers of different languages achieve different fluency levels at the same oral proficiency level (as measured by the ACTFL scale)? In other words, do intermediate L2 speakers of Spanish have a faster speech rate (for instance) than intermediate L2 speakers of Russian? Can these differences be explained by differences in the average speech rates of native speakers of those languages?

Our final question attempted to examine whether L2 speakers of different languages achieve different fluency levels at the same oral proficiency levels (according to the OPI ACTFL scale). In order to answer this question we first examined the differences between L1 and L2 fluency measures (MLR, number of pauses and speech rate). According to our findings, some of the six native languages (English included) that were examined differed in MLR, speech rate and number of pauses. The analysis showed that native Spanish speakers’ MLR and speech rate were significantly higher than in other languages, and native Spanish speakers also produced the smallest number of pauses. Native Japanese speakers, on the other hand, had the lowest MLR and speech rate, and the highest number of pauses produced in their speech. The other languages did not differ from each other in terms of these fluency measures.

These results provided important knowledge in regards to L2 learning because L2 learners may want to keep native speaker fluency patterns in mind when acquiring their L2. Looking more closely at the pattern between different fluency measures of native speakers of different languages and how those patterns are followed by L2 speakers may help L2 speakers improve their L2 fluency. For instance, Table 4.5 demonstrates a gap between L1 MLR and L2 MLR (19.23 (8.94) vs. 10.69 (3.30)) among Spanish speakers. An even bigger gap is observed between L1 and L2 MLR of the Japanese speakers ((15.17 (7.04) vs. 7.36 (2.57)). In this case,
both Japanese and Spanish L2 speakers should increase their speaking time between pauses, which will help them sound more native-like. Thus, the non-native speakers may benefit from following the L1 speakers fluency patterns, which may improve their fluency and overall oral proficiency.

Interestingly enough, according to our results, the non-native speakers of Spanish and Japanese seemed to follow in part the fluency patterns of the native speakers of Spanish and Japanese. In particular, the non-native Spanish speakers had the highest MLR and speech rate, and the smallest number of pauses than the non-native speakers of the other languages. Similarly, the Japanese non-native speakers had the slowest speech rate, lowest MLR and most pauses of the non-native speakers just as the native Japanese speakers had the slowest speech rate, etc., of the native speakers. Such findings may suggest that learners are adept at attempting to imitate the fluency features of the language they are learning.

However, after examining whether L2 speakers of different languages achieve different fluency levels at the same oral proficiency level, we discovered that there was no statistical difference in temporal measures of fluency across the L2 speakers—regardless of the language that they spoke. In other words, we did not find that an Advanced speaker of Spanish, for instance, had a statistically significant faster speaking rate than an Advanced speaker of Japanese in Japanese. In other words, it seems that at the same proficiency level, all of the non-native speakers demonstrate similar temporal features across all of the L2s. These results may suggest that language learners transfer their L1 fluency norms to their L2. One study that demonstrated such phenomenon was conducted by Riazantseva (2001). In her study the pausing patterns of native Russian speakers in their L2 (English) appeared to be following the pattern of their L1 (Russian). According to Riazantseva (2001), “these nonnative pausing patterns could add a
foreign element to the speech even if the nonnative speaker otherwise speaks the language well” (p. 521). Thus, such language specific patterns should be taken into account when learning an L2 (Cox & Baker-Smemoe, under review; Riazantseva, 2001).

However, it may be that our results are not generalizable because we examined only 45 participants (English was not included because we did not have the OPI data for it). Also, the differences in proficiency between the lower and the higher proficiency groups were very slight. After all, the lower proficiency group ratings ranged from Intermediate-Mid level to Advanced low, and the higher proficiency group ranged from Advanced-Low to Advanced- High level of proficiency according to the ACTFL OPI scale. Thus, a more detailed analyses with more participants, preferably at each particular level of proficiency should be performed.

For the third part of the question we looked at the relationship between L1 and L2 temporal features and L2. This analysis helped us see whether the L1 and L2 relationship differed across different L1-L2 combinations. Our results showed significant correlations between L1 and L2 temporal features on almost all of the L1-L2 combinations. All of the languages, however, showed their own particular pattern in the correlations L1-L2 fluency measures. Thus, for instance, Spanish was the only language that showed high correlations on all three temporal measures that we examined. The Portuguese group came close to this result and showed even higher correlations than the Spanish group in regards to MLR and speech rate, but it failed to show significant correlation on the number of pauses. This is interesting because this correlation, even though it was not high, existed in the Cox and Baker-Smemoe (under review) study. While these two languages are very similar to English, and we could hypothesize that the relationship between fluency measures across such similar languages will always be high, it is puzzling that in our study the correlation between L1 and L2 number of pauses was not
significant. Even though this correlation was not high enough, it came quite close to being significant, and the reason it did not reach that point may be that we did not have enough participants (only 8 vs. 37 in Cox and Baker-Smemoe study (under review)). These results are important because they shed more light on how the relationship between L1 and L2 fluency measures affect L2 fluency. The strong correlations suggest that such a relationship may play a role in L2 fluency production. Thus, looking at L1 fluency production may be beneficial when identifying L2 fluency of speakers of certain L2s (perhaps especially those that are quite similar to the L2) because these results indicate that L1 fluency may have affect on L2 fluency production, and therefore corrected measures of fluency may provide more accurate results on L2 fluency ratings.

It is also interesting why L1-L2 fluency relationship was significant for both MLR and speech rate for Japanese and Mandarin Chinese groups, but was not significant for the number of pauses. While Cox and Baker-Smemoe (under review) found a strong correlation between L1 and L2 pausing in Japanese (unlike in our study), they also found a weaker relationship between L1-L2 number of pauses in Korean. Thus, if we were to hypothesize that our differences in L1-L2 pausing pattern from that of Cox and Baker-Smemoe (under review) could be explained by the fact that we may not have enough participants, why would Cox and Baker-Smemoe (under review) find a weaker relationship in Korean even though they examined 27 participants? Such phenomenon could be explained by the fact that such languages differ from English in their pausing patterns. While pauses in English indicate uncertainty or help the speaker gather his/her thoughts before the next utterance, pausing patterns in such languages as Japanese, Mandarin Chinese and Korean carry more of a pragmatic role and therefore are used differently (Kim,
This is important because it may indicate that L1 fluency affects how L1-L2 fluency relationship influences the L2 fluency production.

It is also interesting that Russian was the only language that demonstrated high correlations in only one temporal measure—number of pauses. The correlations between L1 and L2 MLR and speech rate, however, were not significant. What could explain this difference is also puzzling. However, one explanation may shed some light into this phenomenon. In her analysis of Russian language speech rate Stepanova (2011) found that men spoke substantially faster than women while producing spontaneous speech. Since all of the native Russian participants were female, and most of the non-native Russian speakers were male, we could assume that these results were not as accurate as they could be. Thus, further analyses of this relationship conducted with a more generalizable sample is needed.

Another explanation for this phenomenon may be that Russian differs from English on several levels with grammar being particularly distinct. Even though Japanese and Mandarin Chinese also differ from English significantly (tones in Chinese, or cultural identifiers in Japanese), their grammar is relatively simple in comparison to Russian with its gender, number and case markers, as well as mobile stress position. Such factors may slow down speech because of additional tall on cognitive processing, which is required to process all this information. This causes L2 fluency to be more of a ‘state’ for Russian than a ‘trait.’

**Implications**

The results of this study indicate that there is a strong relationship between L1 and L2 fluency and that this relationship may play a role in L2 production. Furthermore, we discovered that native languages differ in their patterns of L1 temporal fluency production and that these differences may affect the production of L2 temporal fluency. We also found that L1-L2 fluency
relationship did not differ at different proficiency levels suggesting that L2 fluency individual factors may play a role in L2 fluency production, but they do differ depending in part on the L1-L2 combinations examined. These findings have different implications for both language teaching and learning, as well as language assessment.

As it was mentioned in Chapter 1, L2 fluency is an important factor when it comes to language learning. For an L2 learner L2 fluency may mean an opportunity of getting a better job or immigrating to another country. Moreover, Dustmann (1994) claims that it is not only one’s employability that may be affected by one’s L2 fluency, but also one’s earnings. Thus, Dustmann (1994) discovered that employees with higher writing and speaking abilities (particularly, oral fluency) received more in earnings than immigrants with lower writing and speaking ability by 10.5 per cent. In addition, Derwing and Munro (2009) discovered that native speakers preferred non-native speech if fluency and comprehensibility rated higher than that of native speakers, suggesting that fluency is an important factor that may surpass native language ability. Thus, better understanding of fluency with respect to learning, teaching and assessment of fluency is necessary in today’s globalized world.

Our findings suggest that it is important to take individual differences of speakers into account when assessing L2 fluency because this may help provide more accurate ratings of a learners L2 fluency and, in turn, overall oral proficiency. Since Japanese native speech, for instance, is characterized by a significantly slower speech rate than that of native Spanish speech, a native Japanese speaker may be rated lower in his/her overall oral proficiency simply because he/she is a slower talker (in both his/her L1 and L2). Thus, as it was mentioned in this chapter, Cox and Baker-Smemoe (under review) propose that in a situation where an interviewer is assessing oral proficiency of speakers with the same language background disregarding L1
fluency may work, but such ideal situations are not always likely to happen. The ACTFL OPI raters, for example, conduct interviews with native speakers of different backgrounds; thus, assessing language proficiency in situations that are far from being homogenous. This, however, is not limited to assessment conducted by individuals. It is also important in ASR testing (Cox & Baker-Smemoe, under review). Correcting measures of temporal fluency in L2 taking into account variance in L1 fluency may produce more accurate results in ASR grading of L2 fluency and overall oral proficiency in general.

In addition, these findings may help L2 educators guide their L2 students in their quest for achieving better speaking ability. Knowing a speaker’s particular fluency patterns may help L2 educators teach L2 better because they will know what needs to be given attention to. Scanlan (1987), for instance, offers several different ideas on improving pausing patterns in American speakers of French (from teaching students to drawl specific vowels in particular French words to teaching students the words and phrases they can use to fill their pauses). Pinpointing such differences to the L2 learners may help them become aware of their fluency patterns and see where they need improvement. Trenchs-Parera (2009) examined how formal instruction in L2 disfluences (such as unfilled pauses, drawls, self-repetitions and others), would affect L2 fluency development of learners after a study abroad. It was found that such instruction helped the participants of the study to “project themselves as more linguistically self-confident and more fluent.” Trenchs-Parera (2009) states, “Certain dysfluency phenomena such as self-repetitions, unfilled pauses, and non-lexical fillers are never actually mentioned in classrooms, in contrast to lexical fillers which tend to be addressed directly… If these oral phenomena are dealt with in the classes … learners may not approach the SA feeling that they lack the necessary skills to succeed abroad…” Thus, it is important to address such issues in L2 classrooms.
Our findings, in general, confirm the view that cognitive processing is important when it comes to L2 acquisition. As it was mentioned in Chapter 2, production of speech (either L1 or L2) is highly dependent on underlying cognitive processing, and therefore, cannot be disregarded when it comes to SLA.

Limitations

The limitations of the current study primarily have to do with the relatively small number of participants. Only 45 non-native speakers and 25 native speakers (5 per each native language) were examined in the study. While those analyses that required the data from all of the participants regardless of language might have provided reliable results, other analyses had to be adjusted to fit the number of participants. Thus, instead of looking at each individual level of proficiency, the participants had to be divided into two groups – the higher and the lower proficiency group. This, in turn, reduced the number of participants even more.

Another limitation of the current study is that only few proficiency levels were looked at. As it has been just mentioned, because there were too few participants per each proficiency level, all the non-native participants had to be divided into major proficiency groups. It would be more beneficial to look at each ACTFL OPI proficiency level separately.

Another limitation of the study is the age of the participants. The average age of the participants is only 24.9 with maximum age being 35 and minimum – 19. This sample, unfortunately, does not represent very well the overall population of the growing community of L2 speakers.

Also, the present study looked only at three measures of temporal fluency (mean length of run, speech rate and number of pauses). It may be beneficial to look at other measures of temporal fluency as well, such as length of pauses, number of filled pauses and hesitations, etc.
This would provide better understanding of L1 and L2 fluency and the relationship between them.

**Suggestions For Future Research**

Future research may benefit from taking the following direction. First, it should address the relationship between L1 and L2 fluency using a bigger pool of participants of different age and different backgrounds. A bigger number of participants will provide opportunities to provide more significant differences in the data, thus showing a clearer picture in the relationship between L1 and L2 fluency. Having a bigger number of participants would also help distinguish between all of the levels of proficiency according to the ACTFL scale and therefore, obtain more fine-grained results in regards to fluency relationship at different proficiency levels.

Looking at fluency over time may also help us better understand L1-L2 fluency relationship. According to Derwing et al (2009), “extensive longitudinal investigations are necessary to establish the long-term relationship between the L1 and L2 fluency” (p. 555). This may help us understand how and why L1 and L2 fluency are correlated and what role this relationship plays in the production of L2. Thus, it may be beneficial to investigate this relationship over a period of time.

Also, it would also be interesting to examine more languages. For instance, languages that are more distance from English than Spanish or Russian and even Japanese or Mandarin Chinese. For instance, it would be interesting to look at such languages as Finnish. Also, one may distinguish between the families of languages while looking into the relationship between L1 and L2 fluency – for instance, dividing between such language families as Germanic, Romance, Slavic, Indic and others and looking at the relationships between them as well. It would be also interesting to look at sign languages and compared their correlations with the
spoken languages. All of this may help us better understand L1 and L2 fluency relationship and provide opportunities to improve our teaching, learning and assessing the L2 fluency and overall oral proficiency.

Conclusion

It was found that the relationship between L1 and L2 fluency is strong and that it may play a role in the production of L2 fluency. It was also found that languages differ in their L1 fluency production and that these differences may also affect L2 fluency. It was also found, however, that the relationship between L1-L2 fluency measures did not differ at different proficiency levels indicating that the individual factors may also play a role in L2 fluency production.
REFERENCES


http://www.oed.com/view/Entry/72066


http://scholarspace.manoa.hawaii.edu/handle/10125/20516


APPENDIX A

INFORMED CONSENT FORM

Consent to be a Research Subject

Introduction

This research study is being conducted by Professors Wendy Baker Smemoe, Jennifer Bown, Dan Dewey, and Rob Martinsen, as well as Olga Maletina, at Brigham Young University to determine the relationships among fluency in your native language, fluency in your second language, and your overall oral proficiency in your second language. You were invited to participate because you are studying a language here at BYU and have recently participated in an Oral Proficiency Interview.

Procedures

If you agree to participate in this research study, the following will occur:

• you will be required to complete a brief demographic questionnaire.
• you will be asked to respond to 3 questions or prompts in your second language.
• you will be asked to respond to 3 similar questions or prompts in your target language.
• your responses will be audio recorded for future analysis.
• these recordings will take place in an office at BYU.
• the researcher may contact you later to clarify your interview answers for approximately fifteen (15) minutes.
• your total time commitment is estimated at a maximum of 20 minutes.

Risks/Discomforts

There are minimal risks for participation in this study. You may, however, feel some discomfort when answering questions or when being audio recorded.

Benefits

There will be no direct benefits to you. It is hoped, however, that through your participation researchers will learn more about the relationship between fluency and proficiency and may be able to assist American Council on the Teaching of Foreign Languages in developing an automatically-rated test of proficiency.

Confidentiality

Example:
The research data will be kept on a password protected computer and only the researchers will have access to the data. At the conclusion of the study, all identifying information will be removed.

Compensation

Participants will receive a $5.00 gift card to the BYU Bookstore for completing the questionnaire and recordings.

Participation

Participation in this research study is voluntary. You have the right to withdraw at any time or refuse to participate entirely without jeopardy to your class status, grade, or standing with the university.

Questions about the Research

If you have questions regarding this study, you may contact Dr. Jennifer Bown at Jennifer_bown@byu.edu or (801) 422-3207 for further information.

Questions about Your Rights as Research Participants

If you have questions regarding your rights as a research participant contact IRB Administrator at (801) 422-1461; A-285 ASB, Brigham Young University, Provo, UT 84602; irb@byu.edu.
Statement of Consent
I have read, understood, and received a copy of the above consent and desire of my own free will to participate in this study.

Name (Printed): ____________________  Signature ____________________  Date: _______
APPENDIX B

QUESTIONNAIRE

Language Background Questionnaire

1. First Name:______________________   2. Last name:______________________

3. email: _________________________

4. What language do you speak besides English (the one for which you recently took or will take an OPI)?

5. Do you speak any other languages? Is so, which ones? (please also briefly explain how you learned them – at home, in school, etc.)

6. Current age:____________________

7. Date of Birth:___________________

8. Place of Birth:___________________

9. How old were you when you first learned your second language? ________________

10. For how many years have you studied your second language? _________________

11. Please list any second language classes you have taken:

<table>
<thead>
<tr>
<th>Type of Class:</th>
<th>Number of Months:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second language (L2)</td>
<td></td>
</tr>
<tr>
<td>Conversation</td>
<td></td>
</tr>
<tr>
<td>L2 Pronunciation</td>
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<td>L2 Writing</td>
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<td>L2 Culture Class</td>
<td></td>
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<tr>
<td>L2 Grammar Class</td>
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</table>

12. Please rate your second language (L2)-speaking ability on a scale of 1 to 10. Rating a “1” means that you don’t speak your L2 at all. Rating a “10” means that you are a native-like speaker of your L2.
16. Have you taken the OPI? ___yes ____no

17. If you have taken the OPI, what was your score? __________________

18. When did you take the OPI? ________________

19. Amount of Time You Speak your Second Language

Please estimate and circle the percentage of time that you speak Korean every day:

At home: 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

At school: 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

At work: 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

At church: 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

With friends: 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Overall: 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
APPENDIX C

PICTURE PROMPT FOR L1

Imagine that you are spending your junior year in Moscow. You are talking with your Russian friend Rita about her plans after graduation. She is debating whether to accept a summer job in her field or to travel for the summer. Rita asks you for your advice. After Rita asks her question, advise her, from your point of view, on what to do.

While studying in St. Petersburg, you are discussing the growing population of homeless people in Russia with your teacher, Maksim Pavlovich Sokolov. He remarks that it is outrageous that the government is paying so little attention to the problem. He argues that it is the responsibility of the government to care for the homeless. Professor Sokolov asks you for your opinion on whose responsibility it is to care for the homeless. After he asks you for your opinion, explain your position to him, giving clear reasons to support your views.

3. Directions for the picture:

Imagine that you’re staying with Russian friends in Moscow. You and your friends are at a birthday party. One of your friends, Marina, has never been to the United States. She asks you to describe what birthday parties are like in the US. You may use the picture below or your own experience as a source for ideas.
APPENDIX D

PICTURE PROMPT FOR L2

Imagine that you are an exchange student at Moscow State University. One of your professors, Mikhail Ivanovich Smirnov, has invited you to give a short talk describing some problems facing the American education system at a round-table discussion on the topic of contemporary problems in education. After Professor Smirnov asks you to speak, thank him for the invitation and begin to describe some problems facing the American education system today. Note that you are NOT expected to give a complete talk in the time allotted. You only need to begin your talk and continue until the time is up.

During a conversation you are having with Nina Ivanovna Borisova, a visiting teacher from Russia, the topic turns to foreign language study in U.S. high schools. Mrs. Borisova asks you what you think the effects would be if every high school student in the United States were required to study a foreign language throughout high school. After Mrs. Borisova asks her question, tell her what you think the possible consequences might be if such a requirement were established.

3. Friends from out-of-town have just called to say that they will be visiting you tonight, so you have telephoned a Russian-speaking classmate, Anya, to tell her you will not be able to meet with your study group this afternoon. Anya asks you why you won’t be able to come. Based on the sequence of pictures shown, tell your friend the many things you are going to do to prepare for the visit of your guests.
Say as much as you can.
Speak clearly.

1. SUPER MART
2. Vacuuming the living room
3. Cleaning the bedroom
4. Throwing trash in the bin
5. Emptying the laundry basket
6. Watering the flowers