THE EFFECT OF TOPIC ON RATE OF SPEECH

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This study reports on the influence of a given topic on rate of speech, one measure of oral fluency. Twenty college-level learners of Spanish from four learner populations participated in a thirty-minute interview. The four groups were classified as follows: fifth semester with no experience abroad (AH_1), seventh semester with no experience abroad (AH_2), seventh semester with one or two semesters abroad (SA), and first year students with experience in an intensive overseas immersion program (IM). A total of twelve common topics were found to appear within the course of each interview. A quantitative analysis followed, and an overall mean rate of speech was calculated for each topic across all participants' interviews. A Mixed Model was run to determine if significant differences occurred between topics and groups. Results showed that averaging among groups, there was a significant difference in the response according to topic as well as a significant interaction between Group and Topic, indicating that differences between groups depended on the topic discussed. Implications are drawn for future work on fluency measures, given the findings of the current analysis.

Key words: fluency, topic, study abroad, immersion, L2 Spanish

Los resultados del presente estudio muestran la influencia de un determinado tema en una medida de fluidez, la velocidad de habla. Un total de veinte aprendices de español de cuatro grupos distintos participaron en una entrevista de 30 minutos. Durante la recolección de datos todos los participantes estaban matriculados en una universidad pública de los EEUU. Los cuatro grupos eran: quinto semestre sin experiencia en el

extranjero (AH₁), séptimo semestre sin experiencia en el extranjero (AH₂), séptimo semestre con uno ó dos semestres de experiencia en el extranjero (SA), y estudiantes de primer año con experiencia en un programa de inmersión en el extranjero de carácter intensivo (IM). Durante el análisis de cada entrevista se encontró un total de doce temas comunes para todos los participantes. Se prosiguió con un análisis cuantitativo y se calculó una media total de velocidad de habla para cada tema a lo largo de las veinte entrevistas. Con el propósito de encontrar cualquier diferencia significativa entre los temas y los grupos de participantes se aplicó un modelo mixto, que reveló que había una diferencia significativa en la respuesta entre los temas así como una interacción entre grupo y tema, lo que significa que la cantidad de diferencias entre los grupos depende del tema discutido. Dados estos hallazgos, se plantean implicaciones para las investigaciones futuras en medidas de fluidez.

Palabras clave: fluidez, tema, estudio en el extranjero, inmersión, español como L2

1. Introduction

The last thirty years of research on fluency have been marked by intense research that has strived to uncover how fluency develops in the interlanguage of L2 learners and how it can be enhanced in a pedagogical approach. Although the core of the quantitative analysis on L2 fluency has focused on the measurement of temporal variables such as rate of speech (measured in words per second, or syllables per second, etc.) and so-called *disfluencies* (e.g., filled and unfilled pauses, repetitions, reformulations, etc.), other factors influencing fluency have also been examined. A number of studies have focused on the type of task that learners perform (e.g., Bygate, 1996; Ejzenberg, 1992; Skehan & Foster, 1999), on planning issues that influence fluency (e.g., Crookes, 1989; Foster & Skehan, 1996; Ortega, 1999; Wigglesworth, 1997, Yuan & Ellis, 2003), on the dimensions of fluency that affect native listener judgments such as hesitancy, foreign accent, and questions of accuracy and complexity (Cucchiarini, Strik, & Boves, 2002; Derwing, Rossiter, Munro, & Thomson, 2004); Ejzenberg, 1992; Freed, 1995; Lennon, 1990a; Riggenbach, 1991; Wennerstrom, 2000),

on comparisons of both L1 and L2 speech production (Deschamps, 1980; Raupach, 1980), on the effect of learning contexts on fluency (DeKeyser, 1991; Freed, 1995, 1998; Freed, Segalowitz et al. 2004, Towell et al., 1996; Temple 1992, 2000, 2005), and on longitudinal effects on fluency (Dechert, 1980; Lennon, 1990b; Towell, 1987).

While the aforementioned body of research has established a theoretical foundation from which to understand L2 fluency, it is not without methodological shortcomings. In trying to account for fluency gains by considering speech rate (words/syllables per minute/second) as a standard measure and by analyzing small fragments of oral production, these studies may have overlooked the potential impact of topic effect on fluency measures. García-Amaya (forthcoming) has shown that when the rate of speech of several turns is measured, learners show considerable ranges of variation.[1] His findings suggest that topic can have an impact, although that was not the principal focus of his investigation.

Although it is broadly accepted that speakers in general have difficulties elaborating on topics with which they are not familiar, it is still unknown how this lack of familiarity influences L2 fluency. Moreover, while psycholinguistic literature has considered the role of topic under the study of *disfluencies* in L1 speech (Merlo & Mansur, 2004; Schachter, Christenfeld, Ravina, & Biluis, 1991; Schachter, Rauscher, Christenfeld, & Crone, 1994), only a few studies have taken into account the role of topic in second language learning (e.g., Pulido 2003, 2004, 2007a, 2007b). In terms of the literature on L2 fluency, however, no study has yet to provide a detailed analysis of the effect that a given topic has on fluency measurements and on the quantitative analysis of temporal variables. The current study was designed to fill this gap in the research on L2 fluency. Additionally, by addressing a methodological issue that arises in studies of second language fluency this investigation tries to serve as a model for future work on temporal variables in oral production research.

The current analysis addresses the effect that topic may have on measures of fluency across different groups of learners. A detailed investigation of a variety of topics may provide a more insightful approach for accounting for possible developmental strategies to gain fluency in the

L2. The research goals of this paper are first, to expand on current research that examines the range of variation that is exhibited in fluency measures (García-Amaya, forthcoming); second, to analyze a possible correlation between topic effect and fluency; and finally, to examine the role of topic in L2 speech for four groups of learners of Spanish with different learning experiences. These results may have pedagogical implications with regard to the teaching of fluency (cf. Nation, 1989; Wood, 2001).

This paper is organized as follows: Section 2 reviews the previous literature; Section 3 presents the research questions and the method used to describe the participants, data collection, and analysis. The results of the study are presented next in Section 4. Section 5 discusses the research and finally, Section 6 concludes the article.

2. Literature Review

The present review of the literature condenses three main venues of research on second language fluency. It reviews the different definitions of fluency that have been put forth in the research on L2 speech, the various tools employed to measure fluency, the effect of context of learning on fluency, and finally, the importance of topic in oral production for both native speakers and second language learners.

2.1. Perspectives on Fluency: Trying to Define the Concept

The first question that deserves attention concerns the definition of fluency. Almost every study addressing the topic of fluency in both L1 & L2 oral speech has tried to provide a definition for this term. With regards to research on L1 fluency, Schmidt (1992) cites Fillmore's (1979) classification of the characteristics of a fluent person. According to Fillmore, a fluent speaker is a fast speaker, one that is coherent, complex, and dense, one that knows what to say and when to say it, and finally one that is able to be creative with language (i.e., jokes, metaphors, etc.) when the situation requires it.

The terms *fluent* and *fluency* have also been used to make reference to L2 speakers, and numerous studies have tried to provide explanations of how these terms are understood by both experts and non-experts in the field of linguistics. As Freed (1995) mentions, there are a number of concepts that people have in mind when they are asked about fluency. In Freed (1995) and Freed et al. (2004), the authors mention that six educated adult native speakers (NSs) defined fluency as "speaking quickly and smoothly", "speaking without saying *um*, without hesitations", "being bilingual", "speaking perfectly", "the ability to make jokes in a language" and "talking easily" (2004:277). Chambers (1997) also comments that expressions such as "he speaks the language fluently" or "he is very fluent" (536) refer to someone who is speaking a foreign language. Although the previous statements may very well reflect the opinion of the general public, the field of SLA has been trying to define this topic for the last thirty years.

The term *fluency* is directly related to speech production in both first and second languages. Levelt has provided one of the most influential models to explain how speech is produced from a cognitive perspective. His 1989 model explains speech production as the combination of automatic and controlled processes that are responsible for generating the message. According to this model, the message to be uttered generates in the conceptualizer, is structured in the formulizer, and is finally realized in the articulator. According to Levelt, "most of the components underlying the production of speech function in a highly automatic, reflex-like way. This automaticity makes it possible for them [the components underlying the production of speech] to work in parallel, which is a main condition for the generation of uninterrupted fluent speech" (2). Even though the primary intention of Levelt was that this model be applied to first language production, a number of researchers have attempted to use it as the basis for other models of L2 speech (De Bot, 1992; Temple, 1992, 2000, 2005). Specifically, a number of researchers have tried to place the study of fluency at the core of our understanding of the relationship between psycholinguistics and L2 oral production.

While the literature provides psycholinguistic definitions of fluency such as that of Schmidt (1992) - who defines second language fluency as "an automatic procedural skill" (358) - others, like Lennon (1990b), have

equated fluency with proficiency and define the former as "the highest point on a scale that measures spoken command of a foreign language" (389). Wood (2001) also observes this ambiguous definition of fluency and points out how this term is normally used to describe performance but is sometimes also used instead to describe certain characteristics of proficiency. Indeed, Wood's perspective on fluency is in agreement with more recent research on this topic, as he establishes that fluency is linked to temporal variables of speech, and therefore to psycholinguistic aspects of oral production. Moreover, Chambers (1997) explains how the definition of fluency involves different characteristics of speech, and how some are measurable (e.g., rate of speech), while others, such as the perception of smoothness or ease of effortlessness can only be measured within the realm of qualitative judgments. These two basic ideas, a procedural skill (i.e., performing a procedure, which is a sequence of activities to achieve a goal) on the part of the speaker and a perception task on the part of the listener, are the basis for the more complete definition that Derwing et al. (2004) provide. These researchers have reached the following consensus on second language fluency: "second language fluency is an automatic procedural skill on the part of the speaker and a perceptual phenomenon in the listener" (656).

In terms of the relationship between fluency and foreign language pedagogy, studies have approached fluency as a skill that can be taught and improved in the classroom (e.g., Nation, 1989; Wood 2001). For Wood, the term fluency is "used frequently to describe language performance, yet it is often defined vaguely and used as a substitute for a group of aspects of proficiency in general" (574). Indeed, his perspective on fluency is in agreement with more recent fluency studies as he establishes that fluency is linked to temporal variables of speech, and therefore to psycholinguistic aspects of oral production. His main contribution is the establishment of a pedagogy of fluency that has as core elements the promotion of automaticity and formulaic language in classroom practice. Other psycholinguistic aspects considered along with fluency are lexical retrieval and its possible enhancement.

Other authors have investigated the role of formulas in L2 fluency. Chambers (1997) claims that formulaic units allow learners to produce longer and more fluent runs. According to Pawley and Syder (1983), the use

of memorized chunks allows the speaker to focus on rhythm, variety, a combination of memorized chunks, or the production of creative connections of lexical strings and concepts. Wood (2001) states that L2 pedagogy should facilitate the acquisition of formulaic competence as well as its automatization. According to Wood, the basic elements of fluency pedagogy are reflected in the integration of interaction and production, as well as in the attention to input and to the formulaic language available.

2.2. Measuring L2 Fluency

Currently, there is a lack of agreement with regard to the way fluency is measured. The most recurrent aspect to be measured in fluency studies is the temporal component of oral production, which according to Griffiths (1991), is comprised of: speech rate, articulation rate, and silent pause phenomena. On the other hand, Lennon, 2000 (cited in Derwing et al. 2004) points out that fluency is not only influenced by temporal variables, but also by an additional series of factors. Indeed, other ways of assessing fluency besides calculating rate of speech, include measuring a mean length of run (MLU), so-called *disfluencies*, which includes rate of pausing (both filled and unfilled pauses), repetitions, and reformulations among others.

With regards to how rate of speech can be calculated, the literature presents a number of procedures. While some authors calculate it in words per minute (Ejzenberg, 1992; Freed, Segalowitz et al. 2004; Lennon, 1990b; Segalowitz & Freed, 2004) and in words per second (Binnenporte et al. 2005) - that is, by examining a given fragment and dividing the total number of words by the total amount of minutes or seconds in which the fragment is uttered - others calculate rate of speech in syllables per minute (e.g., Towell et al. 1996) and in syllables per second (García-Amaya, forthcoming; Temple, 1992). In an article on pausological research in an L2 context, Griffith (1991) mentioned that a measurement of words per minute was not accurate enough to be used in L2 research. Others, such as Ejzenberg (1992), have defended the use of words per minute to study fluency in L2 English speech production. She claims that native speakers of Portuguese and other Romance languages (e.g., Spanish and Italian) use a pattern of articulation in which when they produce English words they add to the original number of

syllables. Therefore, a word such as *Spain* can be pronounced as a two-syllable word [e.g., es-'pein], when it only has one in English [e.g., 'spein]. According to Ejzenberg, this syllabic addition is a pronunciation transfer and using syllables per second as fluency measure could provoke a miscalculation.

These measurements often include or exclude the pause time, and for the most part, it is the responsibility of the researcher to define what is included or excluded in each measure of rate of speech. For instance, Chambers (1987) defines rate of speech as the number of syllables uttered per second; she includes both *articulation rate* and *pause time* in this measure. Chambers agrees with Towell (1987) in using syllables per second to also measure *articulation rate.* According to these authors, this measure provides information about the number of syllables per second produced in actual speech yet excluding the time taken by pauses. In Chambers' words, speech rate is a more comprehensive measure than *articulation rate* and *pausing time*. According to her, rate of pausing is not as relevant for the perception of fluency as the location, the length, and the reason of pauses in discourse.

Although the study of pauses is not a focus of the present investigation, it is still relevant to mention its importance in the research on L1 and L2 speech production. These investigations have been very influential for the study of fluency measures. In this line, a number of researchers have attempted to investigate the role of pauses in L2 production. Griffiths (1991) reviews studies on L2 research along with studies on temporal variables and assesses that this "one of the least distinguished sectors of applied linguistics research" (359). According to Griffiths, only two out of seven studies in Chaudron's 1985 review of classroom investigations mentioned pause phenomena. In addition, Griffiths criticizes that previous pausological research in L2 speech (until 1991) had barely considered the ample results obtained for L1 productions and had not employed the specific and accurate measures that were habitual in this type of research.

The role of pauses in L1 oral speech was investigated in early psycholinguistic experiments in the tradition of Goldman-Eisler's

pausological studies. O'Connell & Kowal, 1980 (cited in Griffiths, 1991) define *pausology* as "the behavioral investigation of temporal dimensions of speech" (8). Although Goldman-Eisler herself never used the term *pausology*, her studies made her the founder of this subfield of applied linguistics/psycholinguistics. In one of Goldman-Eisler's most cited studies on pausing (1958), she showed that participants asked to guess the next word in a transcription of spontaneous speech required more guesses for words that had been preceded by a hesitation than those that were preceded by another word. This is a crucial finding since it may suggest that (using Shriberg's terminology, 1994) the unit of encoding is the word and filled pauses represent the vocalization of a processing mechanism in which a word is retrieved and also articulated. Clark and Fox Tree (2002) indicate that "in (L1) conversation – the prototypical form of language use – fluent speech is rare" (22), and in the same way Chafe (1980), comments on the importance of pausing in native speech production as claims that speaking is a creative act that goes beyond reproducing stored material, including both thoughts and language which need adaptations and remodeling.

The studies mentioned thus far have considered rate of speech as a temporal variable that should be measured to reach a fluency measure. But what remains an issue is the length of the fragment under analysis. So far, well-known fluency studies such as Freed & Segalowitz et al. (2004), Segalowitz & Freed (2004), and Temple (1992, 2005), among others, have reached fluency measures by analyzing small fragments of oral production. Temple (1992, 2005) analyzed 22 samples of L2 spontaneous spoken French of 11 second year French learners. Each of the eleven samples recorded at the beginning and at the end of an academic semester lasted approximately two minutes. Freed, Segalowitz & Dewey (2004) compared the production of 28 students of French as an L2 in three different contexts of learning (i.e., traditional or at home (AH), domestic immersion in a second language environment (IM), and study abroad (SA)). In their investigation, a total of 4 minutes of each student's recording, 2 minutes at each testing time, were selected for analysis. The analysis included two 1-minute segments extracted from each student's pretest and posttest oral interview. Segalowitz & Freed (2004) analyzed two 2-minute segments, thus giving 4 minutes of pretest interview and 4 minutes of posttest interview for each student. Although these two studies present an improvement from the two 45-second samples

analyzed by Freed (1995b), they still fail to provide an accurate measurement of L2 fluency given the range of variation that learners produce. This issue has already been noticed by García-Amaya (forthcoming), who has proven that the analysis of multiple turns (i.e., the longest 15 turns) in longer conversation shows a considerable range of variation for a single learner's rate of speech throughout a sociolinguistic interview. To the best of my knowledge, García-Amaya (forthcoming) is the only study that calculates fluency measures by taking into account more than one turn from a single recorded sample (i.e., longest 15 turns per participant). García-Amaya (forthcoming) advocates a more thorough analysis of speech production that calculates rate of speech (along with other fluency measures) based on a mean of different samples of a particular speaker's production. This procedure seems to provide a more accurate measure that helps balance the existing range of variation.

2.3. Fluency Studies and Learning Contexts

The most researched learning environments in the field of SLA are the study abroad (SA) context and the formal classroom "at home" (AH) context. Since these two environments offer different opportunities of exposure to the target language and are radically different in terms of location, the field of SLA has debated for many years which is superior in terms of L2 gains. Research has shown that each context has its strengths and its weaknesses, and although there has traditionally been a consensus that the SA context is better, empirical research has demonstrated that this is not always the case (see Collentine and Freed 2004 on grammatical competence), and that there are many aspects of each context that have yet to be investigated.

Although this section of the literature review will center on the impact of learning contexts on fluency, it is worthwhile to mention the advances that were made with the publication of Freed (1995a), which expanded our knowledge on learning contexts from both methodological and critical perspectives. Along with Coleman (1996), this was the first volume on second language acquisition research devoted specifically to study abroad programs. The volume provides an overview of studies that had investigated SA vs. AH programs as well as questions on the validity of studies done

during the previous decades. Moreover, it includes a plethora of studies that report on language performance from different quantitative and qualitative perspectives which present more precise and accurate methodologies than previous research on learning contexts. Overall, these studies show that language learners in a SA program speak more and with less pauses, at a faster rate of speech, and are also able to express more complex ideas (Freed, 1995). Lafford (2006), in an overview of study abroad vs. classroom contexts on Spanish SLA, reports that while the SA context is generally better in terms of L2 gains, this is not the case for all domains of linguistic structure.

Interestingly, the findings on research done in the SA and AH context have overlooked the role of IM settings as a third individual learning context. The literature reveals that the term *immersion* has been used to define an intense program where learners spend most of their time attending classes, talking and interacting in an L2 context but is based in the native country of the learners (e.g., the US based French IM program investigated by Freed, Segalowitz, & Dewey 2004). Another example of an immersion program is the one that takes place abroad but that has rules about not using the L1 such as the intensive summer program investigated in García-Amaya (forthcoming), Geeslin, García-Amaya, Hassler, Henriksen & Killam (2008), Geeslin, Willis & Henriksen (2008), and also in the present investigation. In this intensive overseas immersion program learners attended four hours of formal instruction on a daily basis and approximately two hours of activities (i.e., sports, theatre or singing) each afternoon. Finally, all learners were expected to abide by a strict no-English rule.

As can be seen, the lack of agreement with regard to the term *immersion* presents a challenge for proper definition of these different programs, but the main difference is the location of the program (i.e., overseas or local setting). In fact, the type of overseas immersion program previously described previously seems to resemble the one studied in Freed, Segalowitz, & Dewey (2004) in terms of number of classes, contact hours and duration. Their study investigated second language fluency in French by comparing AH formal language classrooms, an intensive summer immersion program (IM), and a study abroad (SA) setting. The authors found that the IM program made significant gains in oral performance (i.e., total number of

words spoken, length of the longest turn, rate of speech, and speech fluidity). Although the SA showed statistically significant gains with respect to the AH group, it did not improve as much as the IM group. Finally, the AH group did not achieve significant gains. In a more recent study, García-Amaya (forthcoming) also found that the learners in an (IM) group provided the fastest rates of speech.

2.4. Topic Effect in L1 and L2 Research

A number of studies in L1 English have considered the importance of topic with regards to the production of *disfluencies*. Although these studies did not examine rate of speech directly (typically measured in syllables per second, words per minute, etc.), they did calculate rate of *disfluencies* which are directly connected to speech production and speech perception. In this line, Schachter et al. (1991) investigated *disfluencies* in lectures and found that those of social science contained more *fillers* than those of humanities. In this study as well as in Schachter et al. (1994) the authors suggested that speakers have a tendency to use more *fillers* when they have to decide from a larger set of options.

Bortfeld, Leon, Bloom, Schober, & Brennan (2001) examined *disfluency rates* in a large corpus of task-oriented conversations. The participants were grouped in male-female dyads and had to discuss objects that were familiar to them such as photographs of children, in addition to unfamiliar ones, such as black and white abstract geometric forms. Each dyad was required to complete four trials, each one consisting of matching a set of picture cards (i.e., photographs of children and tangrams). Among the factors included in Bortfeld et al.'s study were speakers' ages, task roles, and relationships between speakers, gender, and also difficulty of topic domain. The results showed that more *fillers* were produced to discuss pictures of children than tangrams, a result that contradicts previous findings which showed that *fillers* were due mainly to planning difficulties. The authors indicated that the elevated amount of *fillers* that appeared during the picture of children trials are produced by males with higher positions and they suggest that there could be a certain inequity between males and females with regards to this type of picture.

In another L1 English study, Merlo and Mansur (2004) studied the relationship between lexical fillers, repetitions and topic during oral descriptive discourse of adult NSs of English. Participants had to describe the most familiar and unfamiliar topics. Differences were found between familiar and unfamiliar topics in that more attributes (e.g., physical characteristics, functionality of the object) were provided when the topic was familiar (e.g., refrigerator) than when it was not (e.g., helicopter). Overall, participants could describe very familiar and very unfamiliar topics very well. Although not explicitly addressed by the authors, this result may be due to the fact that there was not enough topic variability, and even those that were supposed to be less familiar were also common to the participants. Although information about whether or not participants were familiar with helicopter terminology was not provided, it is reasonable that one can speculate that they had seen one before.

With regard to research on topic effect in L2, only a few studies have considered the effect of topic in second language acquisition. One exception is the work of Pulido, who has carried out two studies on reading proficiency and topic familiarity. Pulido (2003) reveals robust effects of reading proficiency, differential effects of topic familiarity, and isolated effects of passage sight vocabulary. Pulido (2004) also studies the relationship between topic familiarity and passage comprehension and intake, and gain and retention of new lexical items, topic familiarity. Leeser (2007) investigates the interaction of topic familiarity and working memory capacity and its influence of beginning Spanish learner's comprehension and processing of future tense morphology. The results indicated consistent effects for topic familiarity on all the tasks. Also, the experience that participants had with the texts' topics also appeared to be an important variable for the significant findings for working memory.

This literature review has presented a summary of the issues that have been at the core of the research on fluency. First, although definitions of fluency have been provided in previous works, there is no general agreement as to how this term should be defined. Second, the specific variables in empirical research on fluency are numerous, and research methodologies studying L1 fluency have yet to be extended to L2 fluency. Third, the impact on L2 fluency of context of learning, and in particular of

overseas IM programs, has yet to be fully explored. Finally, although the effect of topic has been explored in work on *disfluencies* in L1 English and within the realm of L2 reading comprehension no study has yet to determine its impact on L2 oral fluency.

3. The Current Study

3.1 Research Questions

This investigation is guided by the following research questions:

1. Is there an overall effect for topic on oral fluency (for all learners)?

2. Is there a topic effect for specific groups of learners?

3.2 Participants

A total of twenty adult NS of English learners of L2 Spanish from a large Midwestern university participated in the study. All participants ($n=20$; M age = 19.7 years, $SD = 1.20$) were recruited through email. Each participant met with the researcher in a quiet location in which the informed consent (approved by the Human Subjects IRB) and the language and learning background questionnaire was presented. Once the participants read the information and agreed to sign the consent form, they participated in a sociolinguistic interview with the researcher. A table included in the Appendix summarizes the participants' experience with Spanish as a second language. All twenty learners reported that they had taken introductory classes of Spanish at the pre-University and University levels.[2] For the purpose of this study the twenty learners were divided into 4 groups according to their Spanish learning experience:

AH$_1$ Group ($n=5$). This group consisted of 3 males and 2 females ranging in age from 18-19 years ($M = 18.8$, $SD = .446$). The 5 participants

were enrolled in a Hispanic culture class (the second class that counts credit-wise towards the Spanish major or minor) and had studied Spanish in a formal traditional at-home context only and had never studied abroad. Learners in this group average 4.8 years of pre-University classroom instruction and 2.6 semesters of University classroom instruction.

AH$_2$ Group (*n*=5). This group consisted of 3 females and 2 males ranging in age from 19 to 21 years (*M* = 20.4, *SD* = .89). The 5 participants were enrolled in an introductory course in Hispanic Linguistics (a more advanced class than the Hispanic culture class in the Spanish minor or major) and had never studied Spanish abroad. All 5 participants had been enrolled in a number of University-level Spanish classes in the lower and upper divisions. They had studied Spanish in traditional at-home context and had never studied Spanish abroad. Learners in this group average 6 years of pre-University instruction and 5.6 semesters of University classroom instruction.

IM Group (*n*=5). This is one of the two study abroad groups analyzed in the current study. It consisted of 3 males and 2 females who participated in an intensive overseas immersion program in the north of Spain for 7 weeks. The 5 subjects ranged in age from 18 to 19 years (*M* = 18.4, *SD* = .547). They were all first year students enrolled in a number of courses counting towards the Spanish minor or major, (i.e., Hispanic culture, Hispanic literature introductory class and conversation). In addition to abiding by a no-English rule during their stay in Spain, these participants attended 4 hours of formal instruction on a daily basis and approximately two hours of activities (i.e., sports, theatre or singing) each afternoon. In addition to spending 7 weeks abroad, learners in this group average 6 years of pre-University classroom instruction and 1 semester of University classroom instruction.

SA Group (*n*=5). This group consisted of 5 females ranging in age from 21 to 22 years (*M* = 21.2, *SD* = .44). Learners in this group average 6 years of pre-University classroom instruction, 5.8 semesters of University classroom instruction, and 10.2 months in a study abroad program at the college-level in a Spanish-speaking country. By the time the interview was

recorded, they were taking the same introduction to Hispanic Linguistics course that the AH$_2$ participants were taking.

3.2. Data Collection

The researcher conducted a sociolinguistic interview with each of the participants. Each interview dealt with a variety of topics such as their travel plans, how to cook a favorite dish, plans for the future, who would win the next presidential elections, what they would do if they won the lottery, providing a family description, etc. During the sociolinguistic interviews, each question was presented individually so that each topic could be developed separately. The participants were never interrupted during their responses; the interviewer waited to take his turn in order to encourage further elaboration after a natural pause by the interviewee. Also, when the participants left a topic open, the interviewer prompted for more information. All interviews were recorded with an Olympus DS-2 digital voice recorder. The oral data were then transcribed and analyzed for rate of speech.

3.3. Analysis

The primary metric that was chosen to measure fluency in the current investigation was that of syllables per second. Although there is no general consensus as to which fluency measure is the most appropriate for this type of study, the measurement of syllables per second was chosen due to the fact that Spanish is a syllable-timed language. Additionally, previous studies on L2 French and Spanish have employed this measurement in their analyses (Temple, 1992, 2005; García-Amaya, forthcoming).

In order to analyze a possible effect of topic on fluency measures, it was necessary to identify those topics that had been developed by all participants. Of all the topics that appeared in the sociolinguistic interview, only twelve were repeated in the entire set of participant interviews. These topics are: 1. travel; 2. cooking and food; 3. plans for the future; 4. politics; 5. five million dollar lottery; 6. movie plot; 7. university life; 8. family

description; 9. personal description; 10. fears; 11. accidents; and 12. second language instructor.

While the majority of the topics were developed in just one turn, others were developed in more than one turn, depending on the participant. Overall, participants used between sixteen and twenty-three turns to elaborate on the twelve topics. Once all turns were located and labeled per topic, each turn was analyzed for rate of speech. This measure was calculated by dividing all syllables of all English and Spanish words appearing in the turn by the total number of seconds the participant took to produce the given turn. When a participant developed a topic in more than one turn, a second mean was obtained for all the turns that addressed the same topic. Next, a third mean was obtained for each topic developed for all the participants in each group. Finally, a mean of means was calculated for each group of participants so that the behavior of the different groups could be observed. Although some of the participants used some English words during the interview, this study will only account for their use of Spanish.[3]

4. Results

I now turn to the results of the analysis. It is important to bear in mind that the goal of this project was to quantify the effect that a given topic had on fluency measures for four groups of L2 learners of Spanish: AH_1, AH_2, SA, & IM. I first examine the ranges of rate of speech that exist for each group of learners. This is provided in Table 1 to help the reader become acquainted with the nature of the speech samples that were analyzed. The data reported in Table 1 take into account the full set of turns that was subject to investigation. That is, the minimum and maximum values of the ranges correspond to the rate of speech of single turns. In a number of occasions in order to calculate the rate of speech for a specific topic that was developed in more than one turn, a mean was obtained for the rate of speech of all the turns that covered the same topic.[4]

Table 1. Range of measurement for rate of speech for all groups (all the turns included)

AH$_1$	AH$_2$	IM	SA
.66-4.33	.88-4.14	1.12-4.93	.66-4.48

As can be observed, the ranges of rate of speech are quite similar for all groups of learners. If the AH$_1$ group - whose participants have no experience abroad and the lowest level of Spanish, is compared to the SA group - whose participants have spent a semester abroad and have the highest level of Spanish, very similar ranges can be observed: .66-4.33 syllables per second, and .66-4.48 syllables per second, respectively. The AH$_2$, with a range of .88-4.14 syllables per second, shows that its fastest turn is slower than the same turn for the AH$_1$ (i.e., 4.33 vs. 4.14). Only the participants in the IM group present a higher value than the other three groups both for the slowest turn (1.12) and the fastest turn (4.93).

Table 2. Range of mean rate of speech (all groups included)

AH$_1$	AH$_2$	IM	SA
1.46-2.18	2.13-2.55	2.69-3.26	2.26-3.12

Table 2 shows the ranges of the means of rate of speech of each group for all participants. The ranges of mean rate of speech present very different results from those in Table 1. In fact, the ranges in Table 2 increase according to the different levels of proficiency. While the AH$_1$ group, whose participants had the least exposure to Spanish, present a mean range between 1.46 and 2.18 syllables per second, the three other groups surpass 2 syllables per second in their means (2.13-2.55 for the AH$_2$; 2.69-3.26 for the IM; and 2.26-3.12 for the SA). As can be seen, only learners in the IM and SA groups (i.e., those with experience abroad) overcome the limit threshold of 3 syllables per second on their fastest productions. The IM overcomes this threshold in the *cooking* and *food* topic, and both the IM and SA overcome this threshold when talking about the *travel* topic. With regard to participants in the groups with no experience abroad, participants from the AH$_1$ group only overcome 2 syllables per second when they develop the *family description* topic and the one of *plans for the future*. Finally, the AH$_2$ group

does not show too much variability (between 2.13 for the *fears* topic and 2.55 for the *travel* one).

Table 3. Percentage of the difference between the fastest and slowest turn

| AH_1	AH_2	IM	SA
33.03%	16.50%	17.50%	27.60%

Table 3 reports the percentage of the difference between the fastest and slowest mean rate of speech for the slowest and fastest topic for each of the learner groups. As the table indicates, the two groups that show the largest difference in rate of speech between topics are the AH_1 (33.03%) and the SA (27.60%). Bear in mind that the AH_2 and the SA were taking the same introductory class at the University and the only difference between these learners is that the SA learners had spent one semester abroad.

Figure 1 shows the group means for rate of speech for the twelve topics under analysis. In order to plot these topics, I first included the response of the AH_1 group in an ascending order, from the slowest topic (i.e., *five million dollars*) to the fastest topic (i.e., *plans for the future*). Next, the results for each topic for the remaining three groups were plotted in this fixed order. As can be observed from the data displayed in Figure 1, a number of topics such as *five million dollars* are found among the topics developed within the slowest turns for all groups. Other topics such as *travel* appear among the topics that are developed within the fastest turns. The underlying reason why topics influence rate of speech will require further research. Using Figure 1 as a landmark, I will center on the line of the AH_1 group as a point of reference for faster and slower topics. Topics with which learners were faster (e.g., those at the left end in Figure 1) show the larger number of turns. Moreover, six topics that prompted more turns are also among the fastest ones. Learners used between 6 and 9 turns to develop the *plans for the future* (ranked fastest in Figure 1), between 5 and 8 turns for the *family description* (ranked 2nd fastest turn in Figure 1), between 5 and 12 turns to *travel* (ranked 3rd fastest in Figure 1), between 5 and 12 turns for *university life* (ranked 4th in Figure 1), between 15 and 27 turns for *personal description* (ranked 5th fastest in Figure 1), and between 6 and 14 turns for

politics (ranked 9th fastest in Figure 1). Although the correspondence is not exact, topics that prompted more than five turns per learner group were also among the fastest ones.[5]

In order to obtain a better understanding of these data, two statistical procedures were run. For the current analysis, the dependent variable was rate of speech, and the two independent variables were Group and Topic. Descriptive statistics for these variables and inferential statistical analyses are provided below.

Figure 1. Group mean rate of speech per topic
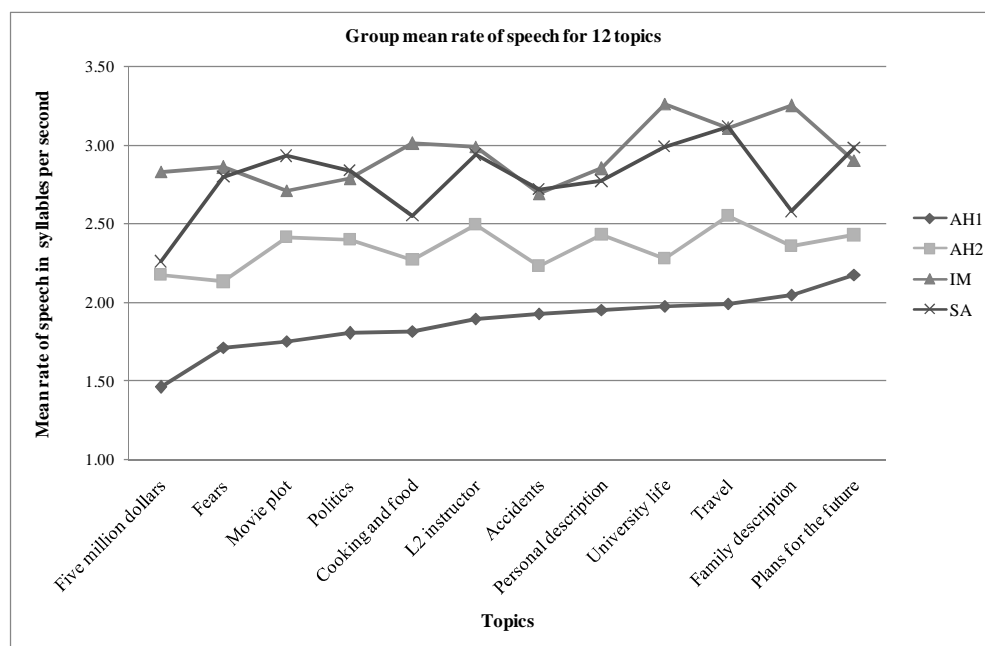
A Mixed Model is a statistical procedure that analyzes the relationship between groups and topics with respect to rate of speech.[6] The type III of fixed effects provided by the Mixed Model showed three statistically significant results that can shed light on the tendencies that the

participants share with regard to the rate of speech in which the topics are developed.

In terms of results, the Mixed Model showed that averaging across topic, there is a significant difference in the response among the four groups ($F_{(3,16)}=3.89$, $p=.029$). Second, averaging across all groups, there is also a highly significant difference in rate of speech among topics ($F_{(11,16)}=10.54$, $p<.001$). Third, there is also a significant interaction between Group and Topic ($F_{(33,16)}=3.20$, $p=.008$), which means that the differences in rate of speech between groups depends on the topic discussed.

5. Discussion

The first portion of this analysis examined the ranges of the rate of speech measurement for each group of learners (Table 1). In comparison to García-Amaya (forthcoming), who analyzed the 15 longest turns of the interview for his 25 participants (20 Spanish L2 learners and 5 native speakers), the current investigation presents a different analysis that was necessary in order to analyze the effect of topic. In the current study, it was necessary to analyze a larger amount of turns for each participant, since as was previously mentioned, responses to some topics spanned more than one turn. Also, the goal was to include data for the twelve topics that appeared in the twenty interviews, implying that the turns analyzed here were not necessarily the 15 fastest turns produced by each speaker. The current approach has shown that learners from four learning contexts (AH$_1$, AH$_2$, IM, and SA) can produce turns with the same rate of speech. For example, the data in Table 1 shows that all learner groups have strikingly similar rate of speech ranges (from ~.6 to ~4.2). The IM group, however, demonstrated a slightly higher range, from 1.1 to 4.9. Looking at the data from Table 2, which reports mean rate of speech for all groups for turns relating to the topics analyzed here, a somewhat different pattern can be observed. There, it is observed that learners with experience abroad (IM & SA) provide higher ranges than learners without experience abroad (AH$_1$ & AH$_2$). For example, the IM and SA learners are those that exceed the 3 syllables per second threshold.[7]

Keep in mind that another research goal of this investigation was to understand the impact of topic effect on fluency measures on four groups of L2 Spanish learners. In order to determine the exact nature of topic effect in the learner data, a Mixed Model was run, which helped determine the nature of topic effect in learner production. The statistical analysis showed a significant difference in rate of speech among the four groups for the topics used ($F(3,16)=3.89$, $p=.029$). This result indicates that significant differences in speech rate exist across the four learner groups. The second result showed that averaging across all groups, there was a highly significant difference in speech rate among topics ($F(11,16)=10.54$, $p<.001$). The third result showed that there was a significant interaction between the factors Group and Topic ($F(33,16)=3.20$, $p=.008$), implying that not all groups of learners speak about the twelve topics with comparable rates of speech.

Although a given topic should ideally have the same effect on rate of speech for all groups, it can be observed that this was not the case for the data analyzed here. That is, while we would expect the difference in the mean rate of speech of each group to be a function of proficiency (i.e., that more advanced groups should speak at a faster rate for a given topic), the results extracted from the current data set show the opposite. Specifically, group speech rate means were a function of topic in addition to level of proficiency. This type of variability associated with topic effect has not been addressed in previous studies of fluency. Such results demonstrate that in order to account for fluency measures, one must ensure that the topic of conversation is controlled.

These results also show that it is insufficient to measure small samples of speech, as has been the practice in studies such as Freed et al. 2004 and Segalowitz & Freed, 2004, who measured 1-minute and two 2-minute recording samples respectively. Since the participants of the current study produced their most complex turns (i.e., more words and more time) in different moments of the interview, it is reasonable to believe that previous studies on fluency that have accounted for rates of speech in different levels of proficiency may have missed the effects that topic had on oral production. Another focus of this study was to analyze the impact of context of learning on L2 fluency. As Derwing et al. (2004) mention, "the relationship between exposure to the L2 and fluency is complex" (660). There is little doubt that

the results obtained from the current study support this claim. While there is certain parallelism between the two groups with experience abroad (SA & IM), regarding the mean rate of speech with which the participants develop each topic, the sharpest differences occurred in the performances of these two groups that studied overseas (IM & SA).

With regard to the pedagogical implications of the current findings, it can be said that any approach to L2 teaching, and especially the teaching of fluency, could benefit from these findings. The findings of the current study imply that it is necessary for learners to receive exposure to and elaborate on a variety of topics in the classroom. This is in line with studies which have approached fluency as a skill that can be taught and improved within a teaching methodology (e.g., Nation, 1989; Wood 2001). In Nation's (1989) model, for example, learners prepare a four-minute talk, but in the end they are only given between two or three minutes to deliver the talk. In his experiment, Nation found that in all cases except for one, the rate of speech increased while the number of hesitations, repetitions, and false starts diminished. Wood's (2001) model of fluency is based on the automatic processing and retrieval of formulaic language units in oral production. By combining automatization, creative construction and formulaic competence, Wood develops a model to improve L2 fluency that includes a series of activities such as 4/3/2 (based on Nation's (1989) model), shadowing, mingle jigsaw, and production tasks. The latter, for example, consists of talking spontaneously about a random topic in dyads. After this dialogue, the rest of the group is expected to comment on the production, the speed of delivery, pauses and hesitations, and other characteristics of the production.

Certainly, models such as those developed by Nation (1989) and Wood (2001) could benefit from the findings of the present study. The current results have shown that not all learner groups (nor individuals) speak about a given topic with the same rate of speech. From the standpoint of foreign language methodology, this implies that students should be motivated to speak about a wide range of topics as they interact with peers and with instructors. Otherwise, there may be a bias towards one or another topic of discussion within a given level of instruction (e.g., family). Future research on the improvement of fluency needs to devise a way of integrating

a wide range of topics into the foreign language classroom. So far, the aforementioned models have failed to take this into account.

6. Conclusions and Future Directions

The results of the current analysis have shown that topic effect is of crucial importance not only for speech rate, but also in terms of the total amount of speech produced. It has been shown in speech samples taken from four groups of L2 Spanish learners with different learning backgrounds, there is a topic effect on learners' rate of speech. Although all learner groups present significant differences for rate of speech and all topics present significant differences as well, there is a significant interaction between Group and Topic, implying that not all groups of learners speak about the twelve topics that were analyzed with comparable rates of speech. These findings show that previous psycholinguistic accounts of fluency may have missed important differences in learner groups and across topics by measuring small speech samples and by not addressing the impact that a given topic has on learner production. Thus, the methodology advocated here, in which numerous turns and longer time intervals of speech are analyzed, provides a more comprehensive view of the combination of factors that contribute to L2 fluency. These findings are intended to motivate both psycholinguists and L2 researchers to develop new methodologies for the development of fluency where the topics available to the learners are controlled for both familiarity and complexity.

In terms of future research, follow-up projects would benefit from an analysis of the syntactic/grammatical complexity underlying the full set of speech samples that were analyzed here. What remains to be learned is what syntactic structures or how filled pauses (e.g., ah, ahm, eh, ehm, mhm, etc.) affect the planning process in oral production. Lastly, it is yet to be fully ascertained which learner level benefits the most from a SA or IM experience as well as what motivational aspects are necessary to obtain gains from a SA program. It has been shown here that the IM participants maintained somewhat faster rates of speech than the SA participants. The difference was not especially robust, so future work could benefit from a more detailed comparison of these two learner groups.

Acknowledgments

Notes

[1] In this study, I adopt Levinson's (1983) definition of a turn: "a turn is a time during which a single participant speaks, within a typical, orderly arrangement in which participants speak with minimal overlap and gap between them" (295-296).

[2] One female mentioned that in addition to English, she also considered Urdu and Panjabi as L1s.

[3] Most of the words used by the L2 learners were English discourse markers (also known as lexical fillers): *like, you know,* etc. García-Amaya (2006) proposed that advanced L2 learners of Spanish use Spanish discourse markers as a strategy to gain oral fluency. Future research should address the role of these structures both in English and Spanish in the oral speech of the L2 learners in this study.

[4] Those turns that were not related to topics (most of them were used to interact with the interviewer) were not considered in this analysis. Evidently, these turns represent another type of oral production, and future research should address this other aspect of learners' oral fluency.

[5] All topics that were not developed at least in one turn by all twenty participants in all learner groups (e.g., AH_1, AH_2, IM, SA) were discarded from the study.

[6] First, a 2-way ANOVA was performed but subsequently abandoned as the test for sphericity was strongly rejected ($p=.004$). Next, it was necessary to find a better fitting model for this type of data that includes only 4 groups with multiple repeated measures of rate of speech, and a Mixed Model was chosen as it is more flexible in how it adjusts for the correlation within subject.

[7] Another unexpected finding pertains to the fact that most topics that prompted a higher number of turns also resulted on higher fluency. Although a more thorough analysis should be devoted to this aspect by future studies, it is plausible to surmise that frequency of occurrence of these topics in classroom setting (e.g., *plans for the future*), along with the grammar and/or vocabulary might be one of the underlying reasons to explain both the higher level of fluency and the multi-turn development. Perhaps *five million dollars* topic was among the slowest turns for all learner groups because of the hypothetical setting that it entails, as well as the need to use yet-to-be-attained constructions such as the subjunctive, etc. This interpretation is certainly speculative, and a more qualitative approach to these data will be needed in order to clarify these assumptions.

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Appendix

Table 4. Language experience

Group	Participant	Years of pre-University classroom instruction	Semesters of University classroom instruction	Months spent abroad
	John	6	3	0
	Hannah	6	3	0
AH1	Helen	4	1	0
	Bill	4	3	0
	Peter	4	3	0
	Average	4.8	2.6	0
	Daniel	6	7	0
	Sara	6	4	0
AH2	Ryan	6	7	0
	Rebecca	6	6	0
	Eve	6	4	0
	Average	6	5.6	0
	David	6	1	2
	Patrick	6	1	2
IM	Kim	5	1	2
	Matt	7	1	2
	Kathryn	6	1	2
	Average	6	1	2
	Mila	6	4	12
	Carrie	6	7	13
SA	Heather	6	7	12
	Maryl	6	4	7
	Liz	6	7	7
	Average	6	5.8	10.2

First version received: July 2008.

Final version accepted: November 2008.