

**L2 Auditory Processing of Three Spanish Dialects.  
Comprehensibility and its Relationship with Accentedness and Familiarity**

by

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## Abstract

The purpose of this thesis is to explore the impact on comprehensibility judgments – the difficulty that listeners perceive they have in understanding an utterance – in the auditory processing of three dialects of Spanish by second language learners (L2) of Spanish. Previous research focused mainly on the comprehensibility of different dialects of English by L2 listeners, showing these listeners might judge one dialect as more difficult to understand than another. Similarly, in the current study, results show that L2 Spanish listeners judge some Spanish dialects as being more comprehensible than others. Furthermore, comprehensibility has been studied in relation to other two constructs, accentedness and familiarity. The Mexican dialect has been judged as being the most comprehensible, the least accented and the most familiar by L2 listeners.

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## 1. Introduction

In the past two decades, the construct of comprehensibility or the difficulty listeners perceive they have in understanding an utterance has received considerable attention, especially in the speech science and pronunciation fields, and to a lesser extent in the second language acquisition discipline. Traditionally, comprehensibility has been studied in relation to two other constructs, accentedness or listeners' perception of an accent with a different sound pattern than the accent of the local variety (Ockey and French, 2016) and intelligibility or listeners' actual understanding of an utterance (Munro & Derwing, 1995). Originally, implicit in this area of research was the assumption that if a listener perceives an utterance as heavily accented and low in comprehensibility (requiring considerable effort on the part of the listener), it might also be judged as slightly intelligible or understandable by the listener. However, research shows that although these three constructs are partly related to one another, they are independent; that is, a strongly accented speech is not necessarily incomprehensible, likewise, a slightly comprehensible speech does not necessarily have low intelligibility (Munro & Derwing, 1995; Munro & Derwing, 2008; Ockey & French, 2016; Saito et al., 2016; Thomson, 2017; Nagle, 2018; Munro & Derwing, 2020). Therefore, studies in this area focus mainly on studying the relationship among these three constructs: comprehensibility, accentedness, and intelligibility, and how L1 English listeners rate L2 English talkers (i.e., speakers who are producing the speech sample) on comprehensibility and accentedness, or how L2 English listeners rate L1 English talkers from different dialects on comprehensibility and accentedness.

Furthermore, comprehensibility and accentedness have been studied in relation to familiarity (listener's previous exposure to an L2), pointing to the fact that the more familiar a talker's dialect is to a listener, the more comprehensible the accent is perceived to be by this listener (Kennedy & Trofimovich, 2008; Carey et al., 2011; Winke & Gauss, 2013).



Thus, it is fundamental to study comprehensibility and its relation to accentedness and familiarity to understand the challenges that L1 or L2 listeners have in real-world communicative situations when they listen to an accent or dialect that is different from the one with which they are familiar. Furthermore, it is essential to understand if the perceived difficulty in understanding an utterance based on accentedness and familiarity with a particular accent or dialect can impact the listening comprehension. In what follows, the constructs of comprehensibility, accentedness, and familiarity will be defined.

### 1.1 Constructs under study

Comprehensibility has been defined consistently in the literature as listeners' perception of how difficult or easy an utterance or text is to understand (Munro & Derwing, 1995; Kennedy & Trofimovich, 2008; Saito et al., 2016; Kang et al., 2018; Nagle, 2018; McBride, 2015; Nagle et al., 2019; Kang et al., 2010). However, researchers like Isaacs and Trofimovich (2012) have confounded comprehensibility with other constructs like intelligibility, stating that comprehensibility can be included under a broader definition of intelligibility. Thomson (2017) stresses the importance of distinguishing the two constructs as intelligibility refers to the actual understanding of a speech, while comprehensibility pertains to the perception of the difficulty that L1 listeners or L2 listeners have when listening to L2 or L1 talkers (Ockey & French, 2016; Major et al., 2005).

Accentedness, one of the constructs thought to interact with comprehensibility, is mainly defined in the literature as listeners' perception of an accent that has a different sound pattern than the accent of the local variety (Munro & Derwing, 1995; Munro & Derwing, 2008; Kennedy & Trofimovich, 2009; O'Brien, 2014; Ockey & French, 2016; Kang et al., 2018). Nonetheless, researchers like Ockey and French (2016) use *accent* to refer to listeners' perception of a pattern different from the local variety, thus confounding it with accentedness.

Furthermore, their operationalization of accentedness via a strength of accent scale encompasses both familiarity with an accent and comprehensibility, thus making their results difficult to interpret.

Intelligibility, the third construct associated with comprehensibility, has been consistently described in the literature as listeners' actual understanding of an utterance (Munro & Derwing, 1995; Munro & Derwing, 2008; Kennedy & Trofimovich, 2008). Intelligibility studies have operationalized this construct in numerous ways, such as counting the percentage of the words transcribed correctly by the listeners, giving listeners a true/false questionnaire about the speech they heard, asking listeners to answer comprehension questions, and then writing a summary of what they heard. These numerous methods of operationalizing intelligibility across research studies sometimes confounds intelligibility with comprehensibility, which is the general ability that a listener has in understanding a talker. Thomson (2017) examine the methods used in previous research to measure intelligibility. He also advises on the need to distinguish between intelligibility and comprehensibility, since the first one refers to "what the listener actually understands" while the second refers to the "effort that the listener makes in understanding an utterance", as explained by Munro and Derwing (1995). However, the ability to understand an L2 talker might depend on the ease of understanding, thus the constructs of intelligibility and comprehensibility are closely related. Since intelligibility is beyond the scope of this thesis, it will not be included in the literature review. To learn more about intelligibility and the way it has been measured see Munro and Derwing (2008) and Kang et al. (2020).

Familiarity is traditionally associated in research with both comprehensibility and accentedness. In general, familiarity with an accent is described as listeners' previous exposure to an L2 or, in the case of an L1 listener, it is the exposure to an L1 dialect that is different from the listener's accent (Adank et al., 2009; Ockey & French, 2016; Major et al., 2005). Winke

and Gass (2013) state that L1 listeners' familiarity with an accent can influence their ratings about comprehensibility and accentedness of L2 talkers' speech. Specifically, they define accent familiarity as the "interlanguage knowledge" that L1 listeners earned through the acquisition of the talkers' native language as an L2 in the past. Some researchers also define familiarity as "interlanguage speech intelligibility benefit," that is, a listener who is familiar with the talker's accent will rate it as highly comprehensible, while a listener who is unfamiliar with the talker's accent will rate it as slightly comprehensible (Kang et al., 2010; Carey et al., 2011; Winke & Gass, 2013).

Various methods have been proposed in the literature to measure the constructs of comprehensibility, accentedness, and familiarity. Specifically, some researchers assess comprehensibility using a 9-point Likert scale (Munro and Derwing, 1995; Isaacs and Trofimovich, 2012). Thomson (2017) explains that there have been concerns about the usage of different scales in previous studies, but they "appear to be largely unfounded" (p.10) and he cites Munro (2017) who "concluded that the widely used 9-point scale captured comprehensibility as well as any other" (p.10).

Recent research studies have tried to find other ways to measure comprehensibility in relation to accentedness. For example, Kang, Rubin & Pickering (2010) argue that studies measure comprehensibility on a 7 or 9-point Likert scale are not highly reliable because the listeners' ratings of comprehensibility on a scale can be influenced by factors such as listeners' familiarity with the accent of the L2 talker. To account for this issue, they developed a scale in which listeners have to use five different 7-point bipolar Likert scales to measure comprehensibility: easy/hard to understand, incomprehensible/highly comprehensible, needed little effort/lots of effort to understand, unclear/clear, and simple/difficult to grasp, to investigate if there is a relationship between the subjective comprehensibility ratings of the L1

listeners and the suprasegmental features of the L2 talkers, such as pitch, tone, stress, measured through a computer-assisted analysis.

As in the case of comprehensibility, accentedness has been rated using a 9-point Likert scale. Thomson (2017) observes that many studies use the same scalar ratings to assess accentedness, but none explain why they use certain descriptors. There are studies as Saito, Trofimovich, and Isaacs (2016) that describe 1 = “not accent” and 9 = heavily accented”, but other studies as Isaacs and Trofimovich (2012) describe 1 = “heavily accented” and 9 = “not accented at all”. However, Thomson (2017) determined that using different descriptors is not an issue, unless researchers want to compare their results to other studies.

In addition to the 9-point Likert scale, researchers assess both comprehensibility and accentedness by measuring linguistic or suprasegmental factors associated with the rating of these two constructs, such as rate, pause length, lexical stress, pitch, segmental errors, grammar accuracy (Isaacs & Trofimovich, 2012; Kennedy & Trofimovich, 2008; Winke & Gauss, 2013; Kang, Rubin & Pickering, 2010; Munro & Derwing, 2020; Saito et al., 2016). Some of the factors are more strongly related to comprehensibility, while others are related to accentedness, as will be presented in the upcoming paragraphs.

Researchers have studied accent familiarity in relation to comprehensibility since they predicted that the more a listener is familiar with an accent the higher the ratings on comprehensibility. This is true both for L1 listeners listening to L2 talkers (Carey et al., 2011; Winke & Gass, 2013) and for L2 learners who listen to L1 talkers (Ockey & French, 2016), but also for L1 listeners who listen to L1 talkers (Adank et al., 2009). In terms of accent familiarity, several measurements have been proposed in the literature. Nagle (2018) creates a background questionnaire in which the L1 Spanish listeners answer specific questions about their proficiency both in English and Spanish to indicate both their familiarity with L2 Spanish speech on a 9-point Likert scale, as well as their previous interaction with nonnative speakers

of Spanish on a 4-point Likert scale. Similarly, Winke and Gass (2013) assess accent familiarity with a background questionnaire about their previous exposure to other languages (both at home and school), their language use experience (for example if they lived abroad), and about their majors and minors. Other studies, such as Ockey and French (2016), develop a familiarity questionnaire through a 4-point Likert scale in which the L2 English listeners indicate how familiar they are with each of the different English varieties (Standard American English, Australian English, British English, other (Canadian, etc.), and nonnative English).

In sum, previous research highlights the importance of studying the construct of comprehensibility in relation to the other constructs. The present study explores L2 Spanish comprehensibility, along with its relationship with both accentedness and familiarity with an accent.

## 2. Previous research on comprehensibility

A review of previous studies on comprehensibility points to the fact that research in this area is addressed from different perspectives. First, most of the studies on comprehensibility focus on how L1 English listeners perceive the speech of L2 English talkers. Specifically, how L1 English listeners perceive the accents of L2 English talkers who have different L1 backgrounds.

In other investigations, L2 English listeners rate L1 English talkers from different English dialects (World Englishes). More recently, there has been a shift in comprehensibility research from a mainly English-centered focus to include other languages, like Spanish (e.g., Nagle, 2018; McBride 2015). Nagle studies L1 Spanish listeners rating L2 Spanish talkers whose native language is English.

The current study directs comprehensibility research to a new perspective by focusing on how comprehensible the speech of L1 Spanish talkers (representing three different Spanish

dialects) is to L2 Spanish listeners and what is the interaction of this construct with accent familiarity and accentedness. In the following subsections, relevant research studies on comprehensibility and its relationship to accent familiarity and accentedness are reviewed according to who is the talker (speaker) and the intended listener.

### 2.1. L1 English listeners rating L2 English talkers on comprehensibility and accent familiarity and-or accentedness

Munro and Derwing (1995) study the impact of comprehensibility ratings and foreign accents on L1 English listeners' processing time of sentences produced by L2 talkers. Specifically, the researchers investigate the relationship between comprehensibility and accentedness and whether previous exposure to foreign-accented speech has an impact on how the listeners rate the two constructs. In their study, 20 L1 English listeners rate 40 sentences produced by ten L2 English talkers whose native language is Mandarin Chinese and a control group of L1 English talkers both on comprehensibility and accentedness. Participants first decided if the utterances were true or false, and each response was time-measured. Then, participants assessed both comprehensibility and accentedness using two 9-point Likert scales. The scale for comprehensibility went from 1 = "not difficult to understand" to 9 = "very difficult to understand". The scale for accentedness went from 1 = "no foreign accent at all" to 9 = "very strong foreign accent". Results show that, as expected, the ratings for accentedness were lower (i.e., no foreign accent) for the L1 English talkers than for the L2 English talkers. Similarly, results show that the ratings for comprehensibility were lower (i.e., very easy to understand) for L1 English talkers than for L2 English talkers. Furthermore, the impact of comprehensibility on the response times found significant results, while accentedness showed a non-significant impact. This result supports the idea that the two constructs are only partially related but are independent. Moreover, analyses were conducted to measure whether

participants' previous self-reported exposure (i.e., familiarity) to accented speech had an impact on comprehensibility and accentedness. Results showed non-significant effects between comprehensibility and familiarity and or between accentedness and familiarity. Nonetheless, Munro and Derwing's (1995) study presents some limitations because they did not consider other linguistic, segmental, or suprasegmental factors to which the ratings of comprehensibility and accentedness could be associated. Thus, subsequent studies try to address these issues.

Isaacs and Trofimovich (2012) study comprehensibility ratings of L1 English listeners to L2 English talkers using a 9-point Likert scale. The text they used was a paragraph length story. In their study, they link the construct of comprehensibility to other factors: phonology, fluency, linguistic resources, and discourse (i.e., coherence and cohesion). Each of these factors was subdivided into different categories. Phonology included segmental error ratio, syllable structure error, word stress error ratio, vowel reduction ratio, pitch contour, and pitch range. While fluency included the total number of filled pauses, the total number of unfilled pauses, pause error ratio, repetition, and self-correction ratio, pruned syllables per second, and mean length of run. The category of linguistic resources included grammatical accuracy, lexical error ratio, token frequency, and type frequency; discourse included story cohesion, story breadth, and story depth. Results show that there is a strong positive correlation between comprehensibility ratings and phonology, fluency, and linguistic resources, while there is no correlation between comprehensibility and pitch range. These findings indicate that the more cohesive, well-structured, grammatically accurate, and the fewer phonological errors (pauses, phonetic substitutions) present in the L2 speech, the more comprehensible it is to L1 English listeners. The study also includes three ESL (English as a second language) teachers' comprehensibility ratings (9-point Likert scale) of L2 English talkers' speech samples. In addition to the numerical rating, teachers had to explain why they gave a particular score and which linguistics aspects of the L2 talkers they focused on to give that rating. Results show

that teachers focused on various linguistic aspects but the most important factor for comprehensibility was grammar. For instance, all the teachers made comments about grammar accuracy or errors when assigning the rating for comprehensibility. The second most important factor is vocabulary and then fluency. Only one teacher out of three took into consideration other factors, such as cohesion, accent or pronunciation, word stress, and intonation. Therefore, these findings help clarify which factors are fundamental in the assessment of L2 talkers' comprehensibility. Moreover, these results indicate that comprehensibility is linked to different linguistic and prosodic factors.

Kennedy & Trofimovich (2008) study focuses on how listeners' previous experience with L2 speech (i.e., familiarity) and semantic context, that is, the knowledge of the context where the utterance is inserted (e.g., if a word is mispronounced but we know the context where the word is inserted then we can understand the utterance) influence their intelligibility, accentedness and comprehensibility ratings. Twenty-four L1 English listeners, half with previous exposure to the L2 and half without any exposure to the L2, rated six L2 English talkers (whose L1 is Mandarin Chinese) for comprehensibility and accentedness, using two 9-point Likert scales. The results show that listeners' experience or familiarity with the L2 had a significant impact on intelligibility. Listeners with previous exposure to the L2 transcribed the sentences more accurately than the listeners who had no previous exposure to the L2. However, results also demonstrate that familiarity with an accent did not have a significant impact neither on comprehensibility ratings nor on accentedness ratings. This means that the listeners familiar with the accent did not rate the L2 talkers' speech as more comprehensible than the inexperienced listeners did, and there was no significant difference in the ratings of accentedness between experienced and inexperienced listeners. Even if experienced listeners have more familiarity with L2 accented speech and they understand it better than inexperienced listeners do, their perception of comprehensibility and accentedness does not change. These



findings confirm Munro & Derwing's (1995) conclusions that even if listeners are familiar with an accent, they do not necessarily give high ratings for comprehensibility and accentedness.

Winke and Gass (2013) argue that familiarity with a particular accent influences the rating process of listeners. They call this phenomenon "the interlanguage speech intelligibility benefit" and they describe familiarity to an accent as "interlanguage knowledge of the test takers' L1 (TOEFL iBT), that is familiarity gained through having learned the L1 of the test takers as an L2 in the past" (p.770). To explore these hypotheses, they ask 26 L1 English listeners to rate the speech of 72 L2 English talkers (from three different L1: Mandarin, Korean and Spanish) and to report, through a stimulated recall task, that is, what they were thinking when they were rating the speech. According to listeners' responses, the authors could identify eight categories on which the listeners based their ratings: L2 talkers' accent, L2 talkers' native language, L1 listeners' heritage status (i.e., if they, the listeners, were heritage speakers of one of the talkers' native languages), affect (their feelings towards the L2 accent), L2 talkers' voice, scoring difficulty and technical problems. Results show that more than half of the listeners reported that their ratings were influenced by their feelings and perceptions towards the accent of the talkers. In particular, the listeners who had positive feelings towards a specific accent (because they were familiar with it) stated that the speech was highly comprehensible, while the listeners who had negative feelings towards unfamiliar accents led them to define the L2 talkers' speech as slightly comprehensible. Thus, the authors find support for their hypothesis on the impact of listeners' familiarity with a specific accent and comprehensibility ratings.

Kang, Rubin, and Pickering (2010) investigate the relationship between comprehensibility and accentedness. They claim that in previous studies listeners' ratings of comprehensibility and accentedness were based on their subjective perceptions using 7 or 9-point Likert scales, which is not a reliable method. The authors argue that some of the suprasegmental factors such as speech rate, pause length, lexical stress, and various aspects of

pitch (e.g., pitch height) are linked to accentedness and it is fundamental to measure them through computer-assisted analysis. Specifically, the authors explain that their study focuses on the relation between listeners' perception of comprehensibility and measures of accentedness obtained through computer analysis. In their study, 188 L1 English listeners rated 26 speech samples of L2 English talkers (six Chinese, six Spanish, eight Korean, and eight Arabic) for proficiency, assessing pronunciation/accent, grammatical accuracy, vocabulary, rate of speech, organization, and how well the requirements were met using 7-point Likert scales. They also rate the L2 talkers for comprehensibility using five 7-point bipolar scales. Results show that there are 14 acoustic variables of accentedness that account for 50% of the variance in the measure of comprehensibility: "um" factor (hesitation), unit completeness, boundary marker, pitch height, suprasegmental fluency, number of filled pauses, mid-rising tone choice, high-level tone-choice, mid-level tone choice, low-rising tone choice, high-falling tone choice, high-rising tone choice, low-falling tone choice, prominent character. In addition, the ratings for comprehensibility are influenced by mid-rising tone choice, high-level tone choice, high-rising tone choice, unit completeness, and a boundary marker. On the contrary, neither the pitch height nor the low-rising tone choice has an impact on comprehensibility ratings. The implication of Kang et al. (2010) study is that the subjective ratings of comprehensibility and proficiency can be related to suprasegmental factors of accentedness. Specifically, in their study, the suprasegmental factors of accentedness are elicited through computer analysis, meaning that it is possible to measure them objectively. Therefore, it is possible to understand which features are important in the subjective ratings of comprehensibility performed by the listeners.

Munro & Derwing (2020) re-examine the investigation of Munro & Derwing (1995) and they analyze the factors that have an impact on the ratings of comprehensibility and accentedness and if there is any relation between comprehensibility, accentedness, and

intelligibility. In their study, 18 L1 English listeners, who are enrolled at a linguistic course or an ESL teaching methodology course, rate ten L2 English talkers of English for comprehensibility and accentedness. The L2 talkers are five males and five females whose L1 is Mandarin Chinese. They are all proficient L2 English talkers, and the authors assess their English pronunciation from moderately to heavily foreign-accented. Moreover, two L1 English talkers are included in the experiment as a control group. The L2 English talkers tell a story using cartoons with an illustrated story as a prompt. Each talker tells a two to three-minute story, and then the authors divide each story into shorter sentences, ranging from four to 17 words, for a total of 36 speech samples. During the first session of the experiment, the L1 English listeners transcribe what they hear to measure intelligibility. During the second session, the L1 English listeners use two 9-point Likert scales to rate the L2 talkers for comprehensibility and accentedness. Results show that the ratings for accentedness are evenly distributed between the categories 2 and 8 (i.e., ranging from “slightly foreign-accented” to “heavily foreign-accented”), while most of the comprehensibility ratings (64%) range from 1 to 3 (i.e., from “extremely easy to understand” to “easy to understand”), pointing to the fact that the ratings for comprehensibility are less rigorous than the ratings for accentedness. Therefore, L1 listeners might deem highly comprehensible even a heavily foreign-accented speech. The authors explain that they calculated the correlation for each listener for accent and intelligibility assessments and the total numbers of phonemic, phonetic, and grammar errors, intonation ratings, and utterance length. However, they explain that they also included the ratings for comprehensibility and accentedness of L1 English talkers and they advise against including these ratings in further research studies because they might lead to higher correlations between the two constructs, which might not be observed in ratings for comprehensibility and accentedness of L2 English talkers. Results on the correlation between comprehensibility and accentedness show that it varies across listeners. Furthermore, the study found that for 83% of

the listeners there is a negative correlation between comprehensibility (scale: high to low) and intelligibility (scale: low to high), while only for 5% of the listeners there is a significant positive correlation between accentedness and intelligibility. Additionally, the authors point out that there is a positive correlation between accentedness and the phonemic, phonetic, intonation, and grammar scores, while there is a weak correlation between comprehensibility and phonemic, phonetic errors. That is, listeners pay more attention to these factors when assessing accentedness than when assessing comprehensibility. These findings reaffirm the fact that the three constructs of comprehensibility, accentedness, and intelligibility are in part correlated, but they are different. Specifically, the results demonstrate that the L1 English listeners rated all the L2 English talkers as highly comprehensible (and through the transcription, they proved that they understood the utterances), but they also assigned to the L2 talkers a wide range of ratings for accentedness. Therefore, even the L2 English talkers who received a high rating on accentedness (heavily foreign-accented speech) were deemed to be highly comprehensible. Furthermore, factors such as phonemic and phonetic errors are highly correlated to accentedness, but not to comprehensibility. This suggests further research is needed to further explore the relationship between the ratings on accentedness and suprasegmental factors.

In line with previous studies, Saito et al. (2016) examine the segmental and suprasegmental factors that could be related to the ratings for comprehensibility and accentedness performed by L1 English listeners to L2 English talkers. Their study has two major goals, first to investigate whether there is a relationship between the constructs of comprehensibility and accentedness and the second one is to investigate if the linguistic factors associated with comprehensibility and accentedness are different at various levels of L2 English proficiency. Saito et al. (2016) recruited 120 L2 English talkers whose L1 was Japanese with different degrees of English proficiency. Five L1 English talkers, all undergraduate and

all inexperienced (i.e., they have no linguistic and pedagogical training) assessed the L2 English talkers on comprehensibility and accentedness. Before rating the L2 English talkers, L1 English listeners' familiarity with Japanese accented English was assessed using a scale ranging from 1 = "not at all familiar" to 6 = "very much familiar with all listeners" reporting a low familiarity with Japanese speakers of English. Then, another set of five L1 English experienced listeners performed a linguistic analysis of phonological, lexical, and grammatical characteristics of the recorded speech samples. In this case, this group of L1 English listeners had between one and ten years of teaching experience and they had all taken a graduate-level semester course on applied phonetics and pronunciation teaching. Before performing the linguistic analysis on the L2 English talkers' speech samples, the five L1 English experienced listeners' familiarity with the Japanese accented English was assessed using a scale ranging from 1 to 6. This group of experienced listeners was quite familiar with the Japanese accented English. The 120 L2 English talkers and the ten L1 English talkers (as a control group) performed a narrative task based on a prompt. In total, the L1 English listeners assessed 390 speech samples, separated into three blocks. First, the inexperienced L1 English speakers rated the L2 English talkers on comprehensibility and accentedness using two 9-point Likert scales. Second, the experienced L1 English listeners assessed the speech for four segmental, prosodic, and temporal categories (i.e., segmental errors, word stress errors, intonation, and speech rate), and for lexis and grammar. For this last task, the L1 English listeners were given the transcripts of the audio speech samples to avoid possible errors due to mispronunciation or lack of fluency of the L2 English talkers. Results show that all the pronunciation categories have a significant impact on comprehensibility ratings, whereas accentedness is more impacted by segmental factors than by intonation and speech rate. Moreover, none of the lexicogrammar categories significantly influences accentedness ratings. In terms of grammar accuracy, the analysis shows that grammaticality has a more significant impact on comprehensibility than lexical

appropriateness. To explore the relationship of L2 English talkers' proficiency and the phonological, lexical, and grammatical categories, L2 English talkers were divided into five proficiency groups - low, high beginner, intermediate, advanced, and native baseline - based on their length of residence in Canada. These five proficiency groups are then divided into four non-overlapping categories based on the ratings for comprehensibility (low, high beginner, intermediate and advanced). Results show that word stress and intonation significantly account for the distinction among comprehensibility groups; segmental factors differentiate low and high beginner groups and intermediate and advanced groups, while speech rate significantly differentiates low and high beginner. Likewise, lexical appropriateness differentiates low and high beginner groups; grammar accuracy accounts for the distinction between low and high beginner groups and intermediate and advanced groups, while both lexical richness and grammatical complexity differentiate high beginner and intermediate groups. The relationship between proficiency levels and accentedness is also explored by dividing proficiency groups into four non-overlapping categories based on the ratings for accentedness (low, high beginner, intermediate and advanced). All the pronunciation categories differentiate the four accentedness groups from one another. Moreover, lexical appropriateness and grammar accuracy distinguish between low and high beginner groups; lexical richness accounts for the distinction between high beginner and intermediate groups; grammatical complexity differentiates high beginner and intermediate groups, and it also differentiates intermediate and advanced groups. Saito et al. (2016) findings confirm the fact that when L1 listeners rate L2 talkers on comprehensibility and accentedness they associate different factors with the two constructs: comprehensibility is primarily related to segmental, prosodic, temporal, lexical, and grammatical aspects, while accentedness is mainly related to pronunciation factors of the L2 speech. Therefore, it is fundamental to investigate which factors are associated with the

constructs of comprehensibility and accentedness to understand the differences in the ratings of the two constructs performed by L1 listeners.

## 2.2 L2 English listeners rating L1 English talkers

Several studies investigate listening comprehension from the perspective of L2 English listeners rating the speech of L1 English talkers. Research from this perspective is deemed relevant because there are many varieties of English and therefore it is important to study if the ratings for accentedness of L1 English talkers change based on their accents and if accentedness has an impact on the L2 English listeners' comprehension. It is fundamental to understand if being familiar with just one of the English varieties or dialects influences the listening comprehension and accentedness ratings of the L2 English listeners, and specifically if their listening comprehension decreases when they are exposed to a variety of English with which they are not familiar.

Ockey & French (2016) study how the strength of accent and familiarity with an accent impact the listening comprehension of L2 English listeners. Specifically, the researchers investigate the relation between listening comprehension of an L2 English listener and the accent strength of an L1 English talker, as well as the relation between an L2 English listeners' comprehension and the L2 English listener's familiarity with a specific accent of an L1 English talker. To assess accent strength, Ockey and French (2016) implemented a "strength of accent scale" they developed in a previous project using three focus groups of L1 English listeners and highly proficient L2 English listeners who rated L1 English talkers from different varieties of English (Australian, British and Standard American English) on the strength of their accent based on a 1 to 5 scale. Then, the same focus groups rated the accents of a different set of L1 English talkers of different varieties of English (US Standard English, British English, Australian English) who participated in the study of Ockey and French (2016). A total of nine

L1 English talkers (4 with a British accent, 4 with an Australian accent, and 1 representing the standard U.S. variety) were selected for the experiment based on the ratings of the strengths of their accents. Participants (all L2 English listeners) were 21,726 TOEFL iBT test takers and had to listen to a monologic lecture of nine speakers, all. Participants answered six comprehension questions after listening to the text and then completed a questionnaire on familiarity with the accents encountered in the experiment. Familiarity is measured on a scale from 1 = “not at all familiar” to 4 = “familiar”. Results show that L2 English listeners who heard the lecture of the USA Standard English talker (who received a score of 1 on the strength of accent scale) had the highest average scores on listening comprehension than the L2 English listeners who heard lectures of L1 English talkers who had a strength of accent of more than 2. The analysis of the data proved that the effect of the strength of accent on listening comprehension scores was significant. This supports the conclusion that comprehension is related to the strength of accent. To determine the relationship among the L2 English listener’s comprehension and familiarity with an L1 English talker’s accent and strength of accent, Australian and British accents were considered separately. Another analysis found a significant interaction between strength of accent and familiarity with the Australian accent. Therefore, L2 listeners who are familiar with the Australian English variety received high scores on the listening comprehension of the lecture read by the L1 Australian English talker. Then, a third analysis was conducted to find an interaction between strength and familiarity with the British accent, but the result was not significant. Thus, the L2 listeners who are familiar with the British English variety did not receive significantly higher scores on the listening comprehension of the lecture read by the L1 British English talker. The authors, though, argue that this might be due to an incorrect rating on the strength of accent of one of the British talkers during the selection of the speakers, or it might be because many listeners think they are more familiar with the British accent than they are since in general, they consider to be more exposed to the



British accent thanks to the media. Overall, the results of Ockey and French (2016) support the findings of other research studies (Adank et al., 2009; Major et al. 2005) that L2 English listeners' familiarity with an accent might help their listening comprehension.

Similarly, Major et al. (2005) explore whether different varieties of English have an impact on the listening comprehension of L2 English listeners and whether the L2 English listeners' familiarity with one of the English accents can help their listening comprehension. Specifically, the research question investigates whether L2 English listeners have more difficulties in the listening comprehension of regional, ethnic, and international dialects of English than with Standard American English. For their study, 180 L2 English listeners and a small control group of 60 L1 English listeners are recruited. The L2 English listeners, at the time of the experiment, all resided in the western United States for one year or less and were enrolled in different U.S. colleges. 12 L1 English talkers are recruited, and they represent different varieties of English (four Standard American English talkers, two Southern American English talkers, two African American Vernacular English talkers, two Indian English talkers, and two Australian English talkers). The L2 English listeners (and the control group of L1 English listeners) listen to all the twelve L1 English talkers delivering a lecture and then, they answer four comprehension questions per lecture. The analysis of the data revealed that the interaction between the L1 English talker's dialect, and whether the listener is L1, or L2 English is not significant, but the dialects of the L1 English talkers did show a significant impact on the listening comprehension of both L1 and L2 English listeners. This means that both L1 and L2 listeners' comprehension were significantly affected by the L1 English talkers' dialect. Results show that there are no significant differences in the listening comprehension of Standard American English and Southern American English for the L2 English listeners. However, the L2 English listeners received significantly lower scores in the listening comprehension of the other English dialects: African American English; Australian English; Indian English. These

results indicate that familiarity with an accent does have an impact on comprehension by L2 English listeners. In this case, L2 English listeners might be more familiar with the Standard American English dialect, since it is the accent they hear the most on TV shows or in college. At the same time, they might be less familiar with the African American English dialect and with the two international English dialects (Indian English and Australian English). Therefore, the results show that there is a significant relationship between different dialects of English (or accentedness) and comprehension, and between familiarity with an accent and comprehension. The findings of Major et al. (2005) are similar to the conclusions of Ockey and French (2016) since familiarity with an accent helps the L2 English listeners' comprehension.

Adank et al. (2009) study the impact of accent familiarity on listening comprehension. Like previous studies, the authors have L1 English listeners rating L1 English talkers but also L2 English talkers who have an accent unfamiliar to them. The authors conducted two experiments to address the effect of familiarity on comprehension. In the first experiment, L1 English listeners whose accent is Southern English (variety of English spoken in London) and L1 English listeners whose accent is the Glaswegian English (variety of English spoken in Glasgow) listen to both L1 English talkers who speak the Southern English (*SE*) and L1 English talkers who speak the Glaswegian English (*GE*) uttering sentences that are true or false based on general knowledge (e.g., "tomato soup is a liquid") under normal and moderate adverse conditions, - 3dB (quiet), 0dB (normal), and 3dB (moderately noisy). Listeners must decide whether each uttered sentence is true or false by pressing a specific key on the keyboard. The results show that the *SE* listeners were slower in giving the correct response when listening to *GE* utterances under moderately adverse conditions (3dB) than were the *GE* listeners. On the contrary, the *GE* listeners had the same response time both when listening to *SE* and *GE* talkers under moderately adverse conditions. For instance, Adank et al. (2009) assume that *GE* listeners are familiar with both the *SE* and the *GE* accents, since the first one is the accent

mostly used by the national media, therefore even the *GE* listeners are exposed to it, while the second accent is familiar to them because it is the one used in their local variety. In the second experiment, *SE* listeners hear utterances from *GE* talkers, *SE* talkers, and L2 English talkers, whose native language is Spanish (*SpE*). The results show that *SE* listeners made a more significant number of errors when listening to *SpE* talkers than when listening to *GE* and *SE* talkers. Moreover, they were slower in response times when listening to *SpE* than when listening to the other two varieties, and they were slower in response times when listening to *GE* talkers under moderately adverse conditions than when listening to *SE* talkers. In general, the results of the two experiments demonstrate that listeners have more difficulties processing the speech of a talker who has a different accent than that of the listener. This finding points to the negative impact an unfamiliar accent has on listening comprehension in general, as well as on the listener's cognitive processing cost. Therefore, it is possible to deduce that accentedness and listening comprehension are related to one another. Specifically, the more accented an L1 English talker's speech, the lower is the listening comprehension of the L2 English listeners, and the more familiar the accent, the better is the comprehension of the L2 English listeners.

The review of previous studies leads to the conclusion that the listeners perceive various accents of English in different ways. Some of the accents (as the Standard American English) are deemed to be easier to understand, while others are deemed to be more difficult to understand (as the Australian English). This depends on various factors, and one of the most important ones is the familiarity of the listener with the accent.

### 2.3 L1 Spanish listeners rate L2 Spanish talkers

Recently, research studies on comprehensibility and accentedness in the fields of speech science, pronunciation, and SLA have shifted their focus from English to other target languages, like Spanish. In particular, research is directed to how L1 Spanish listeners rate L2

Spanish talkers on comprehensibility and accentedness, bringing innovation to this field of study (McBride, 2015; Nagle, 2018; Nagle & Huensch, 2020).

Nagle (2018) conducted a longitudinal study of L2 Spanish talkers rated by L1 Spanish listeners for comprehensibility and accentedness. The study focused on understanding if ratings on these factors improve over three semesters and if the improvement was eventually related to students' motivation and goals. The L2 talkers were rated five times in total (three times, once at the end of each semester and twice in the midterm) on their production of the sentences, e.g., *Mario limpia la cocina* "Mario cleans the kitchen", elicited by an image input and the L1 Spanish listeners heard the sentence twice, and then rated them on comprehensibility and accentedness using two 9-point Likert scales. In addition, the L2 Spanish talkers had to complete "a quantitative selves survey addressing the ideal self, ought-to-L2 self, and learners' intended effort" (p.204) and an open-ended questionnaire on their beliefs and goals to understand how students' motivation impact their improvement, if any, in their comprehensibility and accentedness. The ideal-self questions were related to how the L2 talkers imagined their level of Spanish to be in the future after completing their university career, while the ought-to-L2 self-questions were related to the reasons why they needed to study Spanish. The results show that the L2 Spanish talkers improved both comprehensibility and accentedness of at least one point in the Likert scales during the one-year-long experiment. For instance, in the first session of the experiment, all the L2 Spanish talkers were deemed to be highly comprehensible, even though the L1 Spanish listeners perceived a moderate foreign accent. But the comprehensibility and accentedness ratings performed by L1 Spanish listeners to L2 Spanish talkers improved during the third and the fourth experiments. In addition, the study analyzes how the motivational variables impact comprehensibility and accentedness and if they have any effect on these two factors. Results show that there is a significant relationship between accentedness and self-reported effort, which means that L2 Spanish talkers who try to

improve their accent over time significantly reduce their perceived foreign accent. However, the results show no correlation between the ideal-L2 self and accentedness and between the ought-to-L2 self and accentedness. Furthermore, the investigation reveals no relationship between the motivational variables and comprehensibility. In general, the findings of Nagle's (2018) study prove that the ratings for comprehensibility are less harsh than the ratings for accentedness, and the ratings for accentedness significantly improve over time based on the motivation of the L2 talkers. These results are in line with previous studies' findings, such as Munro & Derwing (2020).

McBride (2015) explores which aspects of the L2 Spanish talkers influence the L1 Spanish listeners' ratings of comprehensibility and pleasantness. L1 Spanish listeners from Mexico and Argentina and three L2 Spanish listeners (whose L1 is English and who are all Spanish instructors), rated the speech of L2 Spanish talkers both for comprehensibility and pleasantness (the overall sense of acceptability that L1 Spanish listeners have about the L2 Spanish talkers' speech) of their pronunciation. The L1 Spanish listeners from Mexico are divided into two groups, high proficiency, and low proficiency in English: 1) 40 L1 listeners are teachers of English as a second language (ESL) and therefore they are deemed to have a high proficiency level of English; 2) 107 L1 listeners are enrolled in Mexican colleges, but they have low proficiency in English. Similarly, the L1 Spanish listeners from Argentina are divided into two groups according to their English proficiency: 50 Argentine students majoring in English who are deemed to be highly proficient in English; 49 students from Argentina who are low-proficient in English. The division of the L1 Spanish listeners by proficiency level in two groups is important because the study investigates whether there are differences in the ratings of the L2 Spanish talkers for comprehensibility and pleasantness based on the familiarity of the L1 Spanish listeners with the L2 Spanish talkers' accent or not (in this case, the L2 Spanish talkers are all L1 English). To rate L2 Spanish talkers, the L1 Spanish listeners

were given a questionnaire with two 7-point Likert scales, one for comprehensibility and one for pleasantness, and an open-ended question in which they had to describe the L2 Spanish talkers by giving two adjectives. The results show that the Mexican listeners gave the highest scores for comprehensibility, while Argentinians and L1 English listeners gave lower scores for comprehensibility. Furthermore, the L1 Spanish listeners who have a high proficiency in English gave better ratings to the L2 Spanish talkers both for comprehensibility and for pleasantness. Interestingly, results reveal that comprehensibility is significantly correlated to pleasantness for the L1 Spanish listeners and L2 Spanish listeners. Then, the author analyzed the comments that the L1 and L2 Spanish listeners made about the speech of the L2 Spanish talkers, to observe which factors are more strongly associated with the ratings of the pleasantness of the speech of the L2 Spanish talkers. The L1 listeners gave answers about positive aspects of the L2 talkers that increased their comprehensibility and pleasantness (slow speech rate, a calm tone of voice, and sounding confident) and negative aspects that decreased both comprehensibility and pleasantness (fast speech rate, inaccuracy about the pronunciation, the talker's attitude). In terms of pleasantness, e.g., "What is pleasant about the talker's way of speaking?" various suprasegmental categories were extracted from the L1 and the L2 Spanish listeners and were associated with the ratings of pleasantness. Thus, the talker's voice (sounding calm, kind, self-assured) accounted for 16% of the ratings for pleasantness performed by the L1 Spanish Mexican listeners with high English proficiency, 24% of the ratings for pleasantness performed by the L1 Spanish Mexican listeners with a low English proficiency, and 29% of the ratings for pleasantness performed by the L2 Spanish listeners. The effort (i.e., the L2 Spanish talkers try to complete the utterance even when they have difficulties) accounted for 15% of the ratings for pleasantness performed by the L1 Spanish Mexican listeners who have a high proficiency level in English, and 15% of the ratings for pleasantness performed by the L2 Spanish listeners. Comprehensibility (i.e., the L2 Spanish

talkers' speech is perceived to be difficult or easy to understand) also impacted pleasantness ratings accounting for 14% of the ratings of pleasantness performed by the L1 Spanish Mexican listeners who have low proficiency in English, 13% of the ratings for pleasantness performed by the Argentine listeners who are proficient in English. When assessing which factors of the L2 talkers' speech were perceived to be an obstacle to L1 Spanish listeners' comprehensibility, the category labeled "N/A" was the one that received most of the percentage. In this category, there are responses such as "se come letras" (They eat letters, i.e., they do not pronounce the words clearly). This category accounted for 16% of the obstacles to comprehensibility rated by L1 Spanish Mexican listeners who are highly proficient in English, 22% of the obstacles to comprehensibility rated by L1 Spanish Mexican listeners who are low-proficient in English, 14% of the obstacles to comprehensibility rated by L2 Spanish listeners, and 8% of the obstacles to comprehensibility rated by Argentine Spanish listeners who are highly proficient in English. In general, McBride's (2015) research shows that the L1 Spanish listeners and the L2 Spanish listeners base their judgments on comprehensibility and pleasantness of the L2 Spanish talkers' speech on segmental and especially suprasegmental factors. These findings are in line with previous studies' conclusions (Kang et al., 2010; Isaacs & Trofimovich, 2012; Saito et al., 2016; Munro & Derwing, 2020).

Nagle and Huensch (2020) study the relationship between intelligibility, comprehensibility, and accentedness in the speech of L2 Spanish talkers, and which linguistic factors are associated with these three constructs. In their study, 30 L1 Spanish listeners rate 19 L2 Spanish talkers both on comprehensibility and accentedness, and they transcribe the utterances they hear as a method to operationalize intelligibility. The L2 Spanish talkers were asked to answer the question: *¿Qué haces en tu tiempo libre?* ("What do you do in your free time?") and two utterances per talker were selected, for a total of 38 utterances that ranged from four to 17 words each. The L1 Spanish listeners were asked to transcribe the utterances

as accurately as possible, and then they rated the same utterances for comprehensibility and accentedness using 100-point sliding scales (where 100 = “understood it very well” and 100 = “slightly accented”, respectively). The results show that most of the utterances were transcribed correctly, the comprehensibility ratings were evenly distributed along the 100-point scale, while the accentedness ratings were skewed towards moderately and highly accented. Concerning the relationship among intelligibility, comprehensibility, and accentedness, results prove that there is a significant relationship between intelligibility and comprehensibility, and between comprehensibility and accentedness, but there is no significant relationship between intelligibility and accentedness. Results also show that comprehensibility ratings are significantly associated with phonemic errors (i.e., producing the incorrect phoneme) and grammatical errors, specifically the more phonemic errors an utterance includes the less comprehensible it is rated and the more grammatical errors an utterance includes the fewer comprehensible it is rated. Similarly, accentedness ratings are significantly associated with phonemic errors. These findings are in line with previous studies’ conclusions (Munro & Derwing, 1995, Munro & Derwing, 1997) that intelligibility, comprehensibility, and accentedness are three different constructs, even though they are partially related to each other. Specifically, intelligibility is related to comprehensibility, while comprehensibility is related to accentedness. The most important contribution of Nagle and Huensch (2020) is that they studied the three constructs in the context of L2 Spanish acquisition, thus shifting the focus of the study from English to Spanish as a foreign language.

These studies prove that the study on comprehensibility can apply to languages other than English. However, the previously mentioned studies focus entirely on the perception of different accents of Spanish judged by L1 Spanish listeners. It would be interesting to shift the focus on the perception of different dialects of Spanish on L2 Spanish listeners. This would be in line with the research conducted by Ockey and French (2016) and Major et al. (2005), who



studied the accent familiarity of different dialects of English as perceived by L2 English listeners. The goal is to understand if the same results are applicable to Spanish as a second language.

### 3. The current study

The current study has two major goals. First, it explores the impact on comprehensibility judgments in the auditory processing of three dialects of Spanish (L1) by listeners of Spanish as a second language (L2). Second, the study investigates comprehensibility and its relationship with listeners' accentedness ratings and familiarity with the Spanish dialect. This study expands the scope of research on comprehensibility by shifting the focus to the L2 listener as a rater of L1 talkers. The talkers in this study represent three different varieties of Spanish, which are Castilian, Mexican and Peruvian. Thus, it advances our understanding of what a learner of Spanish perceives as difficult while processing the speech of different varieties of native speakers of Spanish.

Specifically, the investigation focuses on L2 Spanish listeners rating L1 Spanish talkers from the aforementioned varieties of Spanish in terms of comprehensibility, accentedness, and familiarity. Previous research on English suggests that different dialects had a significant impact on the listening comprehension scores of L2 English listeners listening to L1 English talkers (Ockey & French, 2016; Major et al., 2005). This predicts that listening to different varieties of Spanish can have a significant impact on the comprehension scores of L2 Spanish listeners. The studies reviewed (Ockey & French, 2016; Major et al., 2005) did not address the relationship between comprehensibility and comprehension<sup>1</sup>.

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<sup>1</sup> Even though studies like Munro and Derwing (1995) talk about intelligibility as comprehension, they operationalized it as the ability to transcribe what participants heard. But studying learners of a second language, the ability to transcribe an utterance does not necessarily entail comprehension, in particular for learner at the earlier stages of learning.

### 3.1 Research questions

The present research is guided by the following questions:

RQ1: Is L2 Spanish listeners' comprehensibility impacted when they process different L1 Spanish dialects?

RQ2: What impact, if any, do accentedness and familiarity with an L1 Spanish dialect have on L2 listeners' comprehensibility?

RQ3: What impact, if any, do rankings on comprehensibility, accentedness and familiarity with a dialect have on comprehension?

### 3.2 Predictions

In the current study, I will examine the relationship between comprehensibility and accentedness because I predict that the perception of a very accented speech might lead to lower comprehensibility ratings, since the two constructs are significantly related to one another (Nagle & Huensch, 2020), and therefore a slightly comprehensible and highly accented speech could lead to a low listening comprehension of the L2 Spanish listeners.

The second prediction is that the Mexican Spanish accent might be more familiar to the L2 Spanish listeners given the geographical position of the University where the participants were recruited. However, 70% of the first-year Spanish instructors belong to the Spanish Castilian variety, thus many of the L2 Spanish listeners recruited from this US institution might be also familiar with this variety of Spanish. The third dialect under consideration is the Peruvian dialect. The present study is a first step in exploring this area of research in Spanish and it will be limited to three different varieties.

### 3.3. Methodology

### 3.3.1 Participants

The participants of the study were 14 students enrolled in Spanish classes at a public university in the US. All students volunteered to participate in the study. Thirteen of the participants were native speakers of English from the US, and one was a native speaker of Hindi. The age range was 18-21 and they were all undergraduate students at the time of the study. To explore the impact of dialect on comprehensibility in the auditory modality at the beginning levels, participants were recruited from four first and second-semester Spanish language courses. Participants were offered extra credit in their Spanish class with the permission of the instructor of record, as a reward for taking part in the study. The instructors of the classes from which the participants were recruited had different varieties of Spanish than the three talkers used for the experiment. Specifically, one of the instructors was from Puerto Rico, one was a heritage speaker of Colombia, and the other two were advanced L2 speakers of Spanish.

### 3.3.2 Proficiency test

At the beginning of the experimental session, all participants were tested for their proficiency level in Spanish using the DELE test. The test was administered via the computer using reading prompts. There was a total of 50 questions, 30 multiple choice and 20 reading cloze test with a multiple-choice answer selection. However, due to technical issues with Qualtrics, only 43 questions were presented to the participants: 29 multiple choice and 14 part of the cloze test.

Based on the answers, the overall level of proficiency in Spanish of the participants was low, as expected, as they were recruited from beginner-level Spanish classes. The average score was 14.14 out of 43 questions.

### 3.3.3 Background questionnaire

All the participants completed a background questionnaire about their demographic, academic, and linguistic profiles. In addition, the questionnaire elicited information about their familiarity with Spanish. Specifically, some of the questions were about the participants' previous exposure to Spanish (at school or college, through TV, music, etc.) and with which Spanish accent they think they are most familiar to further assess their familiarity with a particular dialect. The background questionnaire can be found in Appendix D.

## 3.4 Materials and Procedures

### 3.4.1 Stimuli

The stimuli for the present study consisted of six sentences, read out loud by three L1 Spanish talkers representing three different Spanish dialects (Castilian, Mexican, Peruvian). The sentences were recorded in a sound-proof room and talkers were instructed to read the six experimental sentences at a rate that could be understood by an L2 listener, not too fast nor too slow. Several text factors have been cited to have an impact on auditory processing, such as length, vocabulary knowledge, speech rate, syntactic and semantic complexity (Bloomfield et al., 2010). To control for the potentially detrimental effects of length on L2 listening comprehension (Medina et al., 2020), sentences were a total of eight syllables each. In order to control for the variable of vocabulary knowledge, lexical items were extracted from the first half of *Contraseña*, the textbook used in the Elementary Spanish course sequence at the public

university from where the participants were recruited. In terms of semantic and syntactic complexity, experimental sentences were about general knowledge topics (everyday life, physical descriptions, and professions) and included only a single clause. The experimental sentences can be found in Appendix A.

The six sentences were used to create three counterbalanced stimuli lists to avoid having the same talker from a particular dialect always reading the same sentences, and thus to avoid the confounding effect between the sentence and the talker's dialect. For example, for List A, the talker from Castilian Spanish read the first and the fourth sentence, while the talker from Mexico read the second and the fifth sentence, and the talker from Perú read the third and the sixth sentence. In the same fashion, for list B, the talker from Mexico read the sentences that were read by the Castilian talker in list A, and so on. The three different lists can be found in Appendix B. The participants were distributed among the three lists as follows: six participants heard list A, five participants heard list B, and three participants heard list C.

In addition, a total of six distractor sentences were added. Each distractor sentence was added between the rating for accentedness and the rating for familiarity with the accent to avoid that participants might understand that the focus of the study was on the dialects of the talkers. An example of distractor can be found in Appendix C.

### 3.4.2 Talkers

A total of three talkers were recruited from the same American university to record the experimental sentences, distributed as follows: three L1 Spanish talkers, all males, who had different dialects of Spanish (Castilian Spanish from Valdepeñas, Mexican Spanish from Guadalajara, and Peruvian Spanish from Lima).

### 3.4.3. Speech rate

The speech rate of every talker was measured to determine its potential impact on comprehensibility. For each talker, the average speech rate was calculated in syllables per second. It was found that the Castilian talker average rate speech was 4.36 syllables/second (sps), the Mexican talker average rate speech was 4.37 sps, and the Peruvian talker average rate speech was 4.49 sps.

### 3.4.4. Procedure

The experimental session started after participants completed the consent form agreeing to participate in the present study. Participants started the session by entering their assigned code through a Qualtrics survey. Then they proceeded to complete the DELE proficiency test (Montrul, 2012). The experimental task followed the proficiency test, and finally, participants completed a linguistic background questionnaire.

### 3.4.5. Tasks

Two practice sentences were presented to participants to familiarize them with the experimental task using Qualtrics survey. They heard each practice sentence individually and only once. These practice sentences were recorded by the Peruvian talker. Then, they were instructed to translate what they just heard to English. Translation was used to assess comprehension of the sentence, following Medina et al. (2020). Then, participants were instructed to use a set of Likert scales to rate the talkers of each practice sentence on comprehensibility, accentedness and, also, how familiar they were with the talker's dialect.

Once the practice session finished, participants proceeded to the experimental tasks. In the experimental tasks, they heard one sentence at a time once recorded by one of the three Spanish talkers for a total of six sentences. They were instructed to translate, and then used a set of Likert scales to complete their ratings on comprehensibility, accentedness, and familiarity with the dialect of the talker. Nagle (2018) recommended to rate familiarity on a 9-point Likert scale from 0 to 9 (where 0 = “not at all familiar” and 9 = “extremely familiar”). In order to compare the ratings of familiarity to the ratings of comprehensibility and accentedness, two similar scales were created for these two constructs. To rate comprehensibility, participants used a Likert scale from 0 to 9 (where 0 = “extremely difficult to understand” and 9 = “extremely easy to understand”). To rate accentedness, participants used a Likert scale from 0 to 9 (where 0 = “extremely accented” and 9 = “not accented at all”). A sample of the scales used can be found in Appendix C.

#### 4. Results

The goal of the experiment was to analyze whether different Spanish dialects have an impact on comprehensibility, accentedness, and familiarity ratings. Also, it explores whether there is a relationship between comprehensibility and accentedness, and between comprehensibility and familiarity.

The first research question explores whether L2 Spanish listeners' comprehensibility is impacted when they process aurally different L1 Spanish talkers' dialects. In order to answer this question, I analyzed the frequency tables for the ratings of comprehensibility of each one of the three different talkers to determine whether there were differences in the means among the three dialects of Spanish. Three different histograms were created using the data collected in SPSS. The histograms are shown in figure 1, figure 2, and figure 3 and they display the ratings of this variable based on the three different talkers (comprehensibility of Castilian, comprehensibility of Mexican, and comprehensibility of Peruvian).

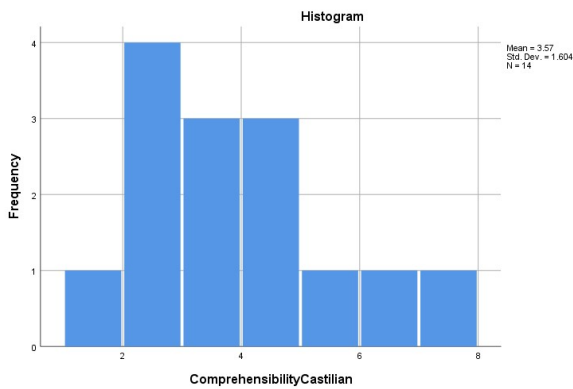


Figure 1. Comprehensibility of Castilian.

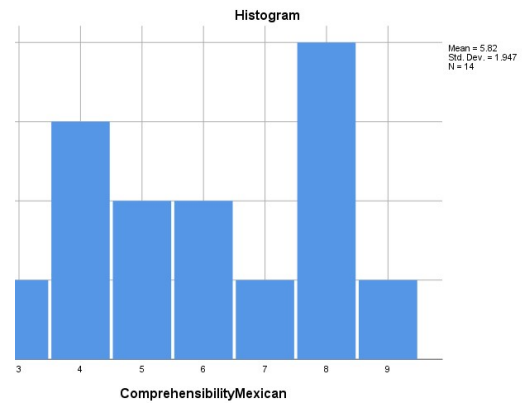


Figure 2. Comprehensibility of Mexican.

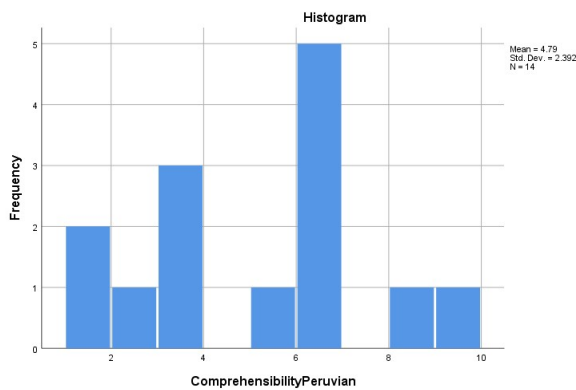


Figure 3. Comprehensibility of Peruvian.

The histograms show the Likert scale for the ratings of comprehensibility on the x axis, and on the y axis the number of participants who assigned specific ratings on comprehensibility



for each of the three dialects. The Mexican talker received the highest ratings for comprehensibility ( $n = 14$ ,  $M = 5.82$ ,  $SD = 1.947$ ), while the Castilian talker received the lowest ratings for comprehensibility ( $n = 14$ ,  $M = 3.57$ ,  $SD = 1.604$ ). The Peruvian talker received a higher rating for comprehensibility than the Castilian talker, but lower than the Mexican talker ( $n = 14$ ,  $M = 4.79$ ,  $SD = 2.392$ ). Interestingly, I examined whether there were differences in the participants' ratings of comprehensibility based on the instructor country of origin (Puerto Rico, HS of Colombia, and two L2 advanced Spanish speakers). Results showed that the differences in comprehensibility based on the instructors' countries of origin was not significant.

The following analysis focuses on the accentedness ratings. The histograms in figure 4, figure 5, and figure 6 show that there is a difference in the ratings of this variable for the three different varieties of Spanish.

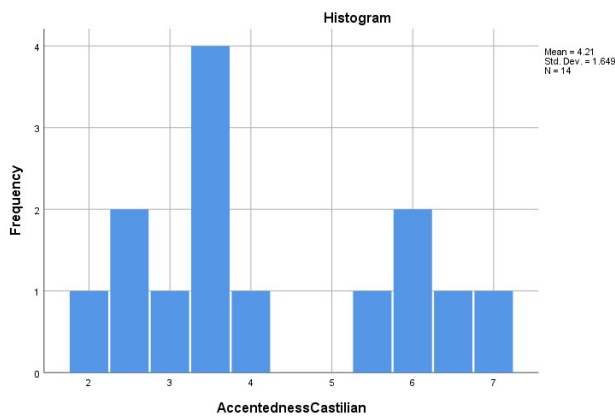


Figure 4. Accentedness Castilian.

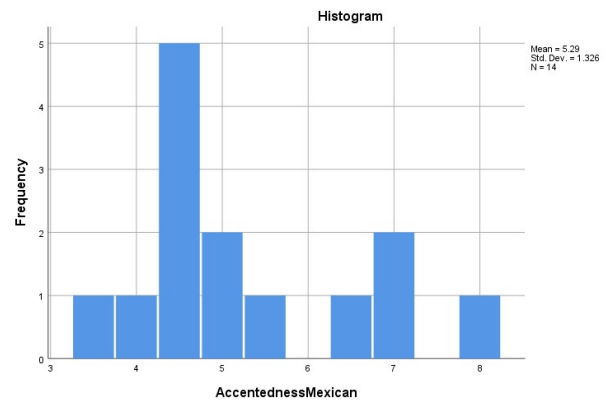


Figure 5. Accentedness Mexican.

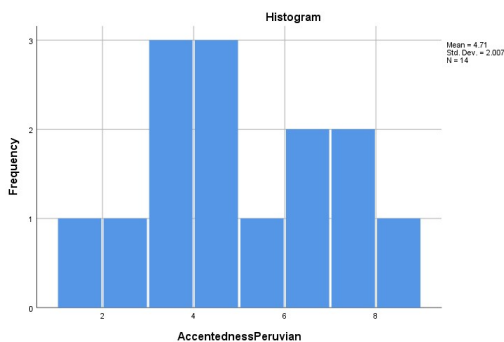


Figure 6. Accentedness Peruvian.

In the histograms, the x axis represents the Likert scale ratings for accentedness, while the y axis represents the number of participants who gave a specific rating.

The tables show that the Mexican talker received the highest ratings ( $n = 14$ ,  $M = 5.29$ ,  $SD = 1.346$ ), meaning that his speech was deemed to be “moderately accented”. The Castilian talker received the lowest ratings ( $n = 14$ ,  $M = 4.21$ ,  $SD = 1.649$ ), meaning that he was deemed to have an “accented speech”. The Peruvian talker received higher ratings than the Castilian talker, but lower than the Mexican talker ( $n = 14$ ,  $M = 4.71$ ,  $SD = 2.007$ ).

The other variable analyzed is familiarity of the listeners with the dialects of the three talkers. The histograms in figure 6, figure 7, and figure 8 show the ratings of familiarity for the three different dialects.

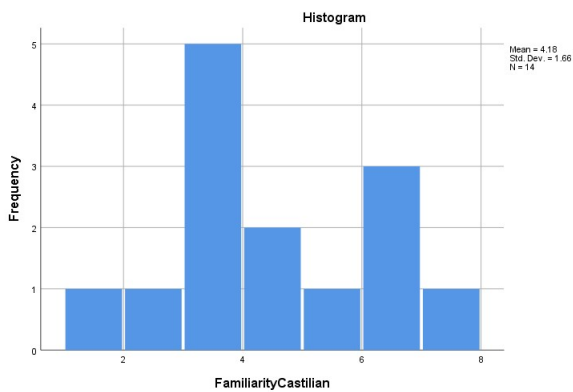


Figure 7. Familiarity Castilian.

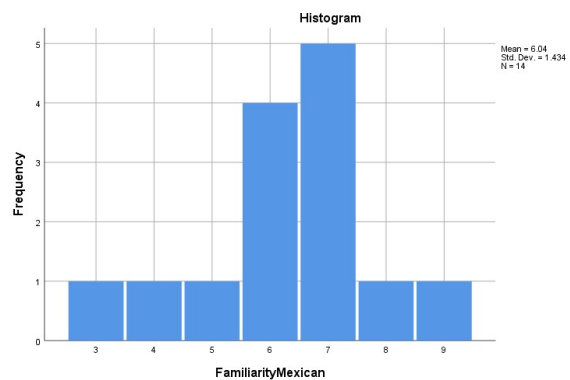


Figure 8. Familiarity Mexican.

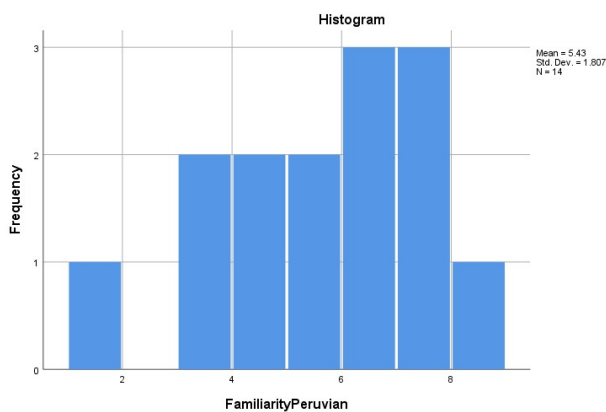


Figure 9. Familiarity Peruvian.

In the histograms, the x axis represents the Likert scale ratings for familiarity with each dialect, while the y axis represents the number of participants who gave a specific rating.

The histograms show that the Mexican talker was deemed to be “very familiar” ( $n = 14$ ,  $M = 6.04$ ,  $SD = 1.434$ ) and the Castilian talker was deemed to be “slightly familiar” ( $n = 14$ ,  $M = 4.18$ ,  $SD = 1.65$ ). The Peruvian talker was perceived to be “moderately familiar” and received higher ratings compared to the Castilian talker ( $n = 14$ ,  $M = 5.43$ ,  $SD = 1.807$ ).

As for the overall comprehensibility, accentedness, and familiarity, figure 10, figure 11, and figure 12 show that the ratings for comprehensibility ( $n = 14$ ,  $M = 4.73$ ,  $SD = 1.15$ ) have a similar mean compared to the ratings of accentedness ( $n = 14$ ,  $M = 4.74$ ,  $SD = 1.436$ ), and familiarity is skewed to the left ( $M = 5.14$ ,  $SD = 1.338$ ), and presents a higher mean compared to the ratings of comprehensibility and accentedness. This means that there is partial correlation between the three variables, even though they are independent from each other. In fact, the ratings for familiarity are higher than the ratings for the other two variables.

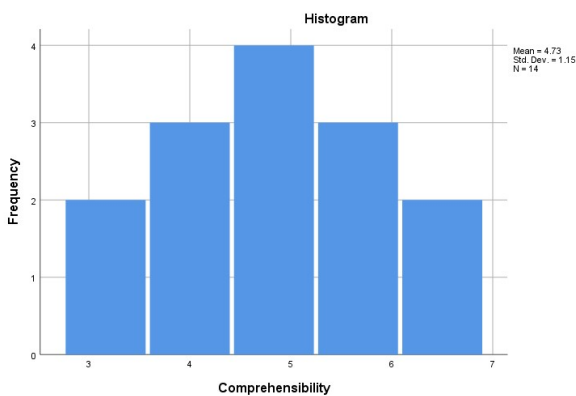


Figure 10. Overall comprehensibility ratings.

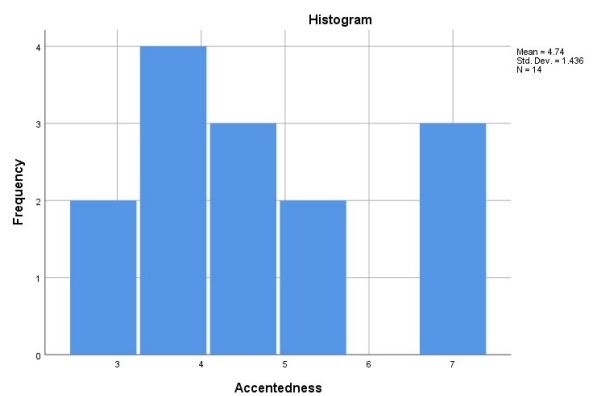


Figure 11. Overall accentedness ratings.

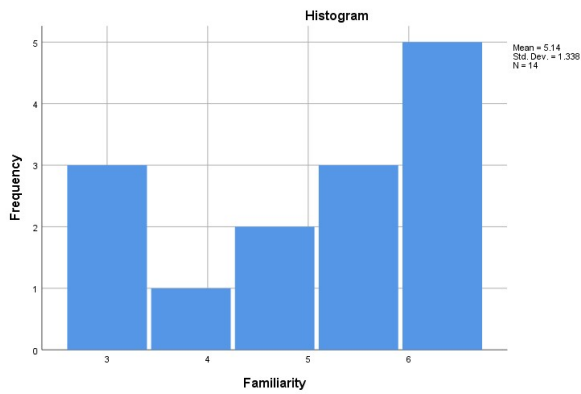


Figure 12. Overall familiarity ratings.

To see whether comprehensibility and accentedness are related and whether comprehensibility and familiarity are related to each other, two different Pearson correlations were performed. The correlation between comprehensibility and accentedness was significant at  $\alpha = .05$  ( $r = .582$ ,  $n = 14$ ,  $p = .029$ ), which means that 33.8% of the variance in comprehensibility can be explained from the relationship with accentedness. As shown in table 1, there is a positive correlation between comprehensibility and accentedness.

		Comprehensibility	Accentedness
Comprehensibility	Pearson Correlation	1	.582*
	Sig. (2-tailed)		.029
	N	14	14
Accentedness	Pearson Correlation	.582*	1
	Sig. (2-tailed)	.029	
	N	14	14

\*. Correlation is significant at the 0.05 level (2-tailed).

Table 1. Positive correlation between comprehensibility and accentedness.

A second Pearson correlation analysis was conducted between comprehensibility and familiarity. The analysis found the relation between these two variables to be significant at  $\alpha = .05$  ( $r = .676$ ,  $n = 14$ ,  $p = .008$ ), which means that 45.6% of the variance in comprehensibility can be explained by the familiarity with an accent. As table 2 shows, there is a positive correlation between comprehensibility and familiarity.

**Correlations**

		Comprehensibili ty	Familiarity
Comprehensibility	Pearson Correlation	1	.676**
	Sig. (2-tailed)		.008
	N	14	14
Familiarity	Pearson Correlation	.676**	1
	Sig. (2-tailed)	.008	
	N	14	14

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Table 2. Positive correlation between comprehensibility and familiarity.

An analysis was carried out to examine the relationship between comprehensibility and actual sentence comprehension. Comprehension was operationalized as the participants' translation into English of the sentences they heard. The translation was coded as 0 if it was totally incorrect, 1 if it was partially correct, and 2 if it was correct. The analysis shows the results of 11 participants out of the total of 14. Three of them have to be excluded from the analysis because they typed the actual sentences they heard in Spanish and did not translate them into English. In fact, transcription in an L2, unlike the case of an L1, is not necessarily the same as comprehension. Only two of the six sentences used as stimuli were translated correctly in almost all the cases. Specifically, the sentences *Nosotras hablamos inglés* ("We speak English") and *Yo vivo cerca del parque* ("I live close to the park") were translated

correctly respectively in 10 cases out of 11 and in 8 cases out of 11. This means that regardless of the dialect of the talker who was producing this sentence, almost all the participants were able to actually understand what he was saying in these two cases. The sentence *Yo tengo pelo rizado* (“I have curly hair”) was translated in a partially correct way in 3 cases out of 11. Specifically, the participants translated it as “I have red hair” in two cases (in the first case the talker was Mexican and in the other case he was Castilian), and “I have pink hair” in the third case (Peruvian talker). The sentence *Usted es un científico* (“You are a scientist”) was translated correctly only in two instances (in one case pronounced by the Mexican talker and in the other case pronounced by the Peruvian talker). For the sentence, *Tú llegas temprano siempre* (“You always arrive early”) only one participant wrote the correct translation (pronounced by the Peruvian talker). For the sentence *Ellas se parecen mucho* (“They resemble each other a lot”) none of the participants was able to give the correct translation, regardless of the talker’s dialect.

## 5. Discussion and conclusion

The present study examined the construct of comprehensibility in Spanish L2 listeners as raters of L1 talkers of three dialects of Spanish. In particular, the first research question explored the impact that auditory processing of different dialects of Spanish might have on L2 comprehensibility ratings. As seen in the results, the dialect that was deemed to be more comprehensible was that of the Mexican talker, and the least comprehensible was that of the Castilian talker. The accentedness ratings of the three talkers show a similar trend as comprehensibility results. The Mexican talker received the highest ratings for accentedness compared to the Castilian and the Peruvian talkers. This means that participants thought that the Mexican talker’s dialect was moderately accented, while the Castilian talker’s dialect was accented, and the Peruvian talker’s dialect was rated between accented and moderately

accented. The correlation between comprehensibility and accentedness proved to be significant, and, as the results showed, 33.8% of the ratings for comprehensibility can be predicted by the ratings given to accentedness. Specifically, the correlation between the two constructs is positive, and as the ratings of comprehensibility increased the ratings of accentedness also increased. This confirms that accentedness does have an impact on comprehensibility, and that the two constructs are partially related to each other.

These findings are not in line with Munro and Derwing (1995) and Munro & Derwing (2020). In fact, in their study they found that comprehensibility and accentedness were not necessarily related to each other, since some talkers were deemed to be highly comprehensible, but at the same time they were deemed to have a strongly accented speech. It was not the case in this study, which found that the Mexican talker, who was deemed to be the most comprehensible, was also rated as being “slightly accented”, while the talker who received the lowest ratings for comprehensibility (meaning that he was deemed to be difficult to understand) also received the lowest ratings for accentedness, meaning that his speech was deemed to be “accented”. However, this outcome is in line with Nagle and Huensch (2020) who found that there was a significant correlation between comprehensibility and accentedness. Even though it is important to notice that in their study L1 Spanish listeners rated L2 Spanish talkers, and therefore their level of proficiency in Spanish is not comparable to those of the L2 Spanish listeners who participated in the current study. Nevertheless, the results about the relationship between comprehensibility and accentedness are similar, and specifically the two constructs are significantly related to each other. Therefore, this finding has implications for the classroom because it points to a factor that might add to the challenges L2 learners face when they try to understand the Spanish teacher’s oral input. Furthermore, this factor might also have an impact outside of the classroom when they face a Spanish talker from a different dialect.

The second research question addressed the impact of familiarity with a dialect and level of proficiency in Spanish on the ratings of comprehensibility. The analysis showed that the dialect of the Mexican talker was deemed to be the most familiar to the participants in this study, while the Castilian talker was the least familiar. The analysis also pointed out a significant positive correlation between comprehensibility and familiarity, and specifically, 45.6% of the ratings given for comprehensibility can be predicted by the ratings given to familiarity. The results of the analysis of the construct of familiarity are in line with previous studies (Winke & Gass, 2013) that stated that comprehensibility is related to familiarity. In fact, the talker who was deemed to be more comprehensible (Mexican) was also deemed to be the most familiar of the three talkers. These results also correspond to the answers that participants gave in the background questionnaire to the question “With which Spanish dialect are you familiar?”, that is five out of fourteen participants reported being familiar with the Mexican accent. This brings support to my prediction that participants would be more familiar with the Mexican dialect because of the geographical proximity between the US and Mexico. It is surprising that the dialect with which the participants were least familiar was the Castilian one. In the predictions, it was stated that participants might be very familiar with the Castilian Spanish dialect because many of the Spanish instructors at the US institution from which they recruited are from this particular dialect. However, the participants rated the Peruvian dialect as more familiar than the Castilian dialect. An explanation might be found analyzing the words used in the experimental sentences. Four out of six presented words with the letters “c” and “z”, which are produced using different allophones in Latin American dialects and in the Castilian dialect. Thus, the Mexican dialect and the Peruvian dialect are phonetically similar, since they pronounce “c” and “z” as [s], compared to the Castilian dialect that pronounces “c”



and “z” as [θ]. The participants, being more familiar with the Mexican dialect, might have encountered more difficulties in processing the allophone [θ] than the allophone [s] and this might have led them to rate the Castilian talker as being less familiar than the Peruvian talker.

Participants’ level of proficiency in Spanish was another of the variables analyzed. Results showed that all the participants had a low level of proficiency in Spanish and none of them reached the intermediate or the advanced level. Therefore, their ratings of comprehensibility might have been distorted by their lack of ability to decode the sounds in Spanish. The fact that they heard the sentence only once made it even more difficult to understand what the talkers were saying.

The actual level of understanding of the participants was measured through the translation of the sentences they heard. Only two out of the six sentences were translated correctly in almost all the cases, regardless of the dialect of the talker who pronounced them. The remaining four sentences were either translated partially correct or totally incorrect in most of the cases, regardless of the dialect of the talker who pronounced them. An interesting outcome is that sentence number three, which is *Ellas se parecen mucho*, (“They resemble each other a lot”), that was translated incorrectly in all the cases, even though this structure is introduced in the first semester class. One possible explanation why participants were unable to understand this sentence might be the verb “parecerse”. In fact, the use of this verb with the reflexive pronoun creates a reciprocal structure. This entails that an English listener must decode “se” and “parecen” as part of the same verbal clause and translate “se” as “each other”. This might be difficult for a listener who has a low proficiency in Spanish. Interestingly, when this sentence was pronounced by the Mexican talker it received higher ratings for comprehensibility than when it was pronounced by the Castilian or the Peruvian talker. Therefore, even if the actual comprehension was wrong, the ratings for comprehensibility were high in the case of the Mexican talker, and lower in the case of the Castilian and the Peruvian

talker. Another interesting outcome is the translation of the sentence *Yo tengo pelo rizado* (“I have curly hair”). In fact, only three participants were able to give a partially correct translation. Specifically, they could translate correctly all the words, except “rizado”. Participants were probably able to process the sound [r], but they were not successful in decoding the other sounds or finding the right lexical item in their lexicon. Therefore, they processed this word associating it to other words with which they might be more familiar, as “rojo” (*red*) or “rosa” (*pink*). For the remaining four sentences, instead, the highest ratings of comprehensibility were given when the participants were actually able to understand the sentence (*Nosotras hablamos inglés*, “We speak English” and *Yo vivo cerca del parque*, “I live close to the park”), and the lowest ratings were given when the participants were not able to actually understand the sentence (*Tú llegas temprano siempre*, “You always arrive early” and *Usted es un científico*, “You are a scientist”). Therefore, there might be a relationship between comprehensibility and comprehension. However, in the current study, only two sentences out of four received high ratings on comprehensibility and were also translated correctly. Therefore, further research is needed to explore the relationship between comprehensibility and comprehension to determine whether there is a correlation.

The results confirm that the three constructs of comprehensibility, accentedness, and familiarity are related to each other when L2 Spanish listeners rate L1 Spanish talkers. Specifically, it is important to highlight that there are Spanish varieties that are considered more comprehensible, less accented, and more familiar to the L2 Spanish listeners than others, and this can also lead to a better comprehension. This is in line with the findings of Ockey and French (2016) and Major et al. (2005) who found that the L2 English listeners considered some of the varieties of the L1 English talkers as being less accented and more familiar than others, which led to a better listening comprehension. Finally, the results also show that there are other factors interacting with the ratings of comprehensibility, accentedness, and familiarity, such as

the L2 listeners' proficiency level in Spanish. In this study, the level of proficiency of the participants was low and this explain why they were not able to understand and translate some of the sentences.

These findings point to the difficulties that L2 learners of Spanish might encounter in a particular language class. In fact, their effort to understand an L1 or L2 Spanish teacher might be related to many factors, such as the perceived accentedness of the speech of the teacher, and their familiarity with the accent. Also, their actual understanding may vary significantly based on the level of proficiency in Spanish. Further research might help to understand better how all these factors are related to each other, and what is the actual relationship between comprehensibility and comprehension in the context of L2 Spanish listeners of L1 Spanish varieties.

## 6. Limitations

The current study presents various limitations. First, the number of participants was very limited, and this makes the present results tentative. Furthermore, the present study was directed to understanding the impact of dialect on the comprehensibility of beginner-level learners. Since their comprehensibility and actual comprehension might have been impacted by their low-level of proficiency in Spanish, it would be interesting to conduct a similar study recruiting a higher number of participants from intermediate or advanced-level classes to see whether their ratings of comprehensibility of different dialects of Spanish are similar to those of the current study or not and whether proficiency plays a role. In addition, further research should include a larger number of sentences and talkers since the current study was limited to exploring the difference in comprehensibility of three different dialects with only six sentences, but it would be interesting to study the comprehensibility of a larger number of dialects of Spanish. Also, a control group of L1 Spanish listeners was not included. Their ratings on

comprehensibility, accentedness, and familiarity of the L1 Spanish talkers would have been useful in order to compare them to the ratings of the L2 Spanish listeners. This could have assessed whether there were differences between L1 and L2 Spanish listeners' ratings. Furthermore, the practice sentences that participants heard before starting the actual experiment were pronounced by the Peruvian talker. This might have played a role in assigning him higher ratings for comprehensibility and accentedness compared to the Castilian talker because of the double exposure to this speaker. Thus, in future research a different talker, who will not be part of the experiment, should pronounce the practice sentences to avoid the double exposure.

Despite these limitations, the current study is a first step towards understanding how different dialects of Spanish might affect the comprehensibility of learners of Spanish as an L2. These findings, although tentative at this time, are important for language practitioners, who must be aware of the listening processing challenges that the L2 students might encounter in the classroom. In fact, their effort to understand what the teacher says might depend on the dialect that is used and how familiar they are with that specific accent. Therefore, even if the students put a lot of effort into understanding Spanish, they might not be successful due to various factors that impact their comprehensibility, as shown in the current study.

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## Appendix A

Experimental sentences used:

1. Usted es un científico.
2. Nosotras hablamos inglés.
3. Ellas se parecen mucho.
4. Yo tengo pelo rizado.
5. Yo vivo cerca del parque.
6. Tú llegas temprano siempre.

## Appendix B

### List A

Usted es un científico (Castilian)

Nosotras hablamos inglés (Mexican)

Ellas se parecen mucho (Peruvian)

Yo tengo pelo rizado (Castilian)

Yo vivo cerca del parque (Mexican)

Tú llegas temprano siempre (Peruvian)

### List B

Nosotras hablamos inglés (Peruvian)

Yo tengo pelo rizado (Mexican)

Tú llegas temprano siempre (Castilian)

Usted es un científico (Mexican)

Ellas se parecen mucho (Castilian)

Yo vivo cerca del parque (Peruvian)

### List C

Ellas se parecen mucho (Mexican)

Yo vivo cerca del parque (Castilian)

Usted es un científico (Peruvian)

Tú llegas temprano siempre (Mexican)

Yo tengo pelo rizado (Peruvian)

Nosotras hablamos inglés (Castilian)



Distractor

Rate how pleasant the speaker was in your opinion.

Strongly                  Somewhat                  Neither pleasant                  Somewhat                  Strongly  
unpleasant                  unpleasant                  nor unpleasant                  pleasant                  pleasant

0	1	2	3	4	5	6	7	8	9
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## Appendix D

**Please answer all questions truthfully to the best of your ability and knowledge.**

**Information provided will be used only for the purposes of the study. Your answers will not affect the evaluation of your performance or your candidacy for the bonus points.**

### Personal information

Code number \_\_\_\_\_

Gender M    F    Other    Prefer not to answer

Age \_\_\_\_\_

Spanish Instructor \_\_\_\_\_

Your Auburn University e-mail address for any  
notifications \_\_\_\_\_

### Language information

Is English your native language?    Yes    No

If not, what is your native language? \_\_\_\_\_

Have you ever studied a foreign language (not Spanish)? Yes No

If yes, which one(s) and for how long? \_\_\_\_\_

Do you watch, on a regular basis, TV shows or movies in Spanish? Yes No

Which Spanish accent are you familiar with? Castilian Peruvian Mexican  
Argentinian Nonnative Spanish None of the above I don't know

None	1 year of high school or 1 semester of college	2 years of high school or 1 year of college	3+ years of high school or 3+ semesters of college
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Where was/were your Spanish instructor(s) from? \_\_\_\_\_

Academic information

What is your academic level and year (freshman, sophomore, first year graduate student, non-degree seeking, etc.)?

\_\_\_\_\_

What is your major at Auburn University? \_\_\_\_\_

Do you have any minors? Yes No

If yes, which one? \_\_\_\_\_

Why are you enrolled in a Spanish class? \_\_\_\_\_

Why have you agreed to participate in this research? \_\_\_\_\_