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Subjectivity as a Predictor of Adjective Ordering Preferences for Heritage Spanish Speakers

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Abstract

Adults, as well as children, tend to present adjective ordering preferences in their use of multi-adjective strings. For example, the ordering of “big blue bird” rather than “blue big bird” is reliably preferred for speakers of English. Subjectivity, as studied by Scontras, Degen, and Goodman (2017) in the case of English, has been shown to be a robust predictor of these adjective ordering preferences, where less subjective adjectives are preferred closer to the noun.

These preferences have been studied in other languages, and are shown to be present in both pre nominal languages like English, as well as post nominal languages like Spanish (Scontras, Bar-Sever, Kachakeche, Jr, & Samonte, 2020). Still, much of the previous work on adjective ordering preferences has centered a monolingual experience, and has not considered if multilingual speakers differ in their presentation of these preferences, in any of the languages they speak. This study focused on determining if heritage speakers of Spanish in the United States present adjective ordering preferences in either their Spanish or English language use, and if those preferences could be predicted by subjectivity in the same manner as their monolingual peers.

Adjective ordering preferences were determined in English and Spanish for heritage Spanish speakers, and in both languages these preferences were found to be predicted by adjective subjectivity ratings from heritage Spanish speakers, although this prediction was weaker than previous monolingual studies of the same languages. Furthermore, the subjectivity ratings collected could predict the adjective ordering preferences of the opposite language just as well as their own, indicating that subjectivity of adjectives is not tied to the language a multilingual speaker is using, and rather a more inherent understanding in our general language capabilities.

These findings further previous assertions that adjective ordering preferences may be a linguistic universal by contextualizing them in the ever more common multilingual experience.

Keywords: Adjective ordering preferences, Subjectivity, Heritage Speaker
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Literature Review

Introduction

Amidst beautiful language diversity, linguistic universals have been heralded as windows into ways in which our communication has developed similarly. Often unnoticed by an individual speaker, but consistent across populations, preferences regarding the order of adjectives in multi-adjective strings have received attention as a potential linguistic universality. When describing a bird with blue feathers that is large, speakers of a pre-nominal language will describe the bird as a “large blue bird”, and speakers of a post-nominal language will describe the bird as a “bird blue large”. Extensive work has been done on theories of how we have arrived at these preferences for adjective ordering (Scontras, 2023). Traditionally, these theories have been based around the assumption that speakers order adjectives based on lexical classes, where certain traits of an object are placed closer or further from the noun depending on what they describe (Cinque, 2010; Dixon, 1982). In a turn away from the lexical class trend, recent work has explored how semantic factors, such as subjectivity, may be driving strong adjective ordering preferences (Scontras et al., 2017). Looking at semantic factors, we begin to ask the more pressing question of where these strong - potentially universal - preferences arise.

Language acquisition and use does not occur in a bubble. Best put by Noam Chomsky, a central issue in the investigation of linguistic phenomena is the lack of consideration for the varied, nonuniform linguistic environment in which many acquire language. The “ideal speaker-listener, in a completely homogeneous speech-community” (Chomsky, 2014) is going extinct, and to continue to consider linguistic subjects in this way would be to deny the multitude of immigrant experiences, of people who call two cultures, and languages, home. The case of heritage speakers, defined as speakers exposed to one native language in childhood who are also native speakers of the dominant language of their society, brings to light the socio-cultural factors that color the varied tapestry of language acquisition (Scontras, Fuchs, & Polinsky, 2015). Heritage speakers have become the focus of studies looking at how a potential linguistic universal, like adjective ordering preferences, could be subject to cross linguistic effects between a heritage language and a dominant language (Kachakeche & Scontras, 2020). Of particular interest as well has been the acquisition of these adjective ordering preferences, which
have been studied in monolingual environments (Bar-Sever, 2018; Grohe, 2022). Heritage speakers are a particular kind of bilingual whose second language input came early in their life, rather than, say, a classroom setting later in life. For this reason, studies on child language adjective ordering inspired the focus on heritage language speakers in this work.

The Spanish language allows for both pre-nominal and post-nominal adjectives, with pre-nominal adjectives considered more restrictive, and post-nominal used for more expressive sequences of adjectives (Sánchez & Camacho, 2021). Multi-adjective strings primarily appear in the post-nominal position, their order seems to be less restrictive in comparison to English, and multi-adjective strings are preferred with conjunction (Pérez-Leroux, Tough, Pettibone, & Chen, 2020; Rosales & Scontras, 2019). In a monolingual environment, adjective ordering preferences have been established in both English and Spanish monolinguals, but adjective ordering preferences have not been specifically studied in the case of bilingual speakers of English and Spanish. Considering that adjective ordering preferences have been observed to be present as early as two or three years old in English children (Bar-Sever, 2018), particular interest has been taken in heritage speaker bilinguals in contrast to bilingualism generally, as their bilingualism emerged around the time that these preferences are first formed. Subjectivity has been shown to predict preferences in English speakers, and in a monolingual environment, subjectivity has been found to be a predictor of AOPs in the Spanish language, but this question has not yet been asked of the heritage Spanish speaker (Scontras et al., 2020).

The present study is interested in if heritage speakers of Spanish and English present AOPs (adjective ordering preferences) in either Spanish or English, and if these preferences in either language are predicted by subjectivity judgements of adjectives. These results will be compared with monolingual adjective ordering preferences and subjectivity judgements in each language, to investigate how a multilingual upbringing may impact the adjective ordering preferences of a speaker.

This literature review will briefly summarize the two main approaches towards studying AOPs in relation to the Spanish language, then explore the case of heritage speakers and survey how AOPs have been studied by acquisitionists.¹

¹ This literature review is inspired by and expanded on a literature review completed by Louise A. Schiele (2022) in...
Theories of Adjective Ordering Preferences and the Spanish Language

Since Sweet in 1898, there has been extensive work on theories of adjective ordering preferences. Though all of these theories cannot be touched on here\(^2\), one can divide the debate on adjective ordering preferences into theories which focus on the syntax adjective phrases, and those which have focused on semantics as influencing adjective order. In this section, each of these camps of theories and past studies concerning them will be discussed in relation to the Spanish Language.

Before beginning, a brief explanation of adjective ordering in Spanish. Both pre-nominal and post-nominal adjective positions are used, with the post-nominal position usually being regarded as the dominant position, as it is where extensional or attributive adjectives usually fall, and where we see a possibility for recursion in multi adjective strings (Sánchez & Camacho, 2021). In example 1, we can see this potential for recursion in the post-nominal position.

(1) a. El lápiz azul
   The blue pen
b. La chaqueta roja grande
   The big red jacket

It is pertinent to note that conjunction is preferred in using multi-adjective phrases in Spanish (Rosales & Scontras, 2019). Preliminary work on adjective ordering preferences in Spanish focused on multi-adjective strings with conjunction, and adjective ordering preferences were not observed in these cases (Rosales & Scontras, 2019). However, when multi adjective strings without conjunction in Spanish were revisited, as they are not ungrammatical, only less common, adjective ordering preferences were observed (Scontras et al., 2020). These preferences can be investigated through the lens of different theories of AOPs.

Structural theories of Adjective Ordering Preferences in Spanish

Most work on adjective ordering preference so far has focused on lexical class as the determiner of AOPs for attributive adjectives. Many variations on the exact classes and ordering

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\(^2\) For a more in depth review, see Scontras (2023)
have been proposed but the hierarchy outlined in work by R. M. W. Dixon in 1982 presents the general trend of lexical class theories (Dixon, 1982).

(2) AOP: Value > Dimension > Physical Property > Speed > Human Propensity > Age > Color > N

Dixons classes assume that when adjectives are placed before a noun in a language such as English, they will be hierarchically ordered in this manner before the noun. Thus, using a prior example, the aforementioned “big blue bird” would align with Dixons hierarchy, shown in 3.

(3) “Big” (size) > “Blue” (color) > “Bird” (noun)

Expanding on Dixon, as well as other theorists, Guglielmo Cinque proposed his own set of lexical classes to define AOPs. His categories are similar to those proposed by Dixon, and his most notable contribution in the case of Spanish is his assertion that lexical class hierarchies not only apply to pre-nominal languages, but also to post-nominal languages (Scontras, 2023). Cinque asserts that the adjectives in a post-nominal language would appear in the mirror image order in comparison to a pre-nominal language (Cinque, 2010). Returning to our big blue bird example, this mirror image order is shown in 4.

(4) El pájaro azul grande

“Bird” (noun) > “Blue” (color) > “Big” (size)

While Cinque succeeded in creating a theory of AOPs that frames them as a potential linguistic universality, this explanation still leaves much to be desired in the case of Spanish. Most notably, Spanish may be much less restricted in terms of its adjective ordering, which does not align with the strict hierarchy proposed by Cinque, though the literature is conflicted on this point. Demonte (1999) describes the acceptance for adjective ordering outside of the Cinque hierarchy in Spanish for both pre-nominal and post-nominal positions: at times when adjectives are reordered the semantic meaning changes, but a switch does not necessarily create the same discomfort that a shift in ordering in English, a more restricted language, would make (Demonte, 1999). As well, in her analysis of NAA (noun-adjective-adjective) and ANA (adjective-noun-adjective) sequences in Spanish using a Google Ngram dataset as well as the
Corpus de Español, Pérez-Leroux et al. (2020) determined that the lexical class theories do not fully encapsulate the variation in adjective ordering preferences. Adjectives categorized as relational adjectives (examples include “industrial”, “constitutional”, “monochrome”) were strictly placed adjacent to the noun in both ANA and NAA structures, yet past the prioritization of these adjectives, evidence for a strict structure such as Cinque suggests was not present in the data. In some cases, Leroux even found free variation between classes of adjectives, such as value and time adjectives (Pérez-Leroux et al., 2020). This study was limited by the datasets being used, both of which primarily include formal written texts, and working with a more varied dataset would derive stronger conclusions about the strength of AOPs in Spanish.

In support of hierarchical preferences, findings from Liliana Sánchez investigating the adjective ordering preferences of heritage Spanish speakers found their participants to present AOPs that mirror Cinque’s ordering hypothesis (Sánchez & Camacho, 2021). Participants were asked to rate the acceptability of multiple multi-adjective strings, one of which aligned with the mirror image described by Cinque, one of which aligned with preferences for adjective ordering in English, and another which was incompatible with both. This is shown in 5, where sentence 5a reflects the nationality - color - size ordering preferred in Spanish following Cinque’s schema, 5b reflects the linear ordering of adjectives preferred by English speakers, only with the noun moved to the front, and 5c as an example of an ordering incompatible with English AOPs.

(5)  
   a. Un libro italiano verde grande (NCS, Spanish)  
       a book Italian green big  
   b. Un libro grande verde italiano (SCN, Spanish)  
       a book big green Italian  
   c. Un libro verde grande italiano (CSN, Spanish)  
       a book big Italian green  

It was hypothesized that participants would favor the ordering shown in 5b, as it is compatible with AOPs in English. However, this effect was not shown, and participants rated the acceptability of both 5a and 5c similarly. This does not show strong evidence towards Cinque’s analysis, as 5c was still an acceptable option to the participants and is not compatible with
Cinques ordering. Still, it does show that AOPs of Spanish, when understood in terms of Cinques analysis, may be maintained in heritage Spanish despite cross linguistic influence from an English dominant environment (Cinque, 2010; Sánchez & Camacho, 2021).

**Meaning based theories of adjective ordering preferences**

Lexical class theories of AOPs, though useful in their description of adjective use, side step the question of how AOPs arise, which is the question which first inspired Henry Sweet, in 1898, to investigate them. Sweet focused on the meaning of adjectives and how they modified the meaning of the nouns they surrounded. He used the example of the “old wise men” “wise” as a modifier of men, creating a new concept of “wise men”. “Wise men” could be called “sages”, and this is distinct from the general concept of “men”. Thus, the adjective “wise” is more closely connected to the meaning of “men” than “old” in this case (Scontras, 2023). Sweets work was a preliminary step in the exploration of AOPs, and further work on the connection between meaning and adjective placement has been done: Whorf in 1945 differentiated between inherent (color, material, etc.) and residuum adjectives (anything not inherent), asserting that the inherent adjectives would be placed closer to the noun (Scontras, 2023). Similarly, Sproat and Shih differentiated between absolute and relative properties, with absolute properties including adjectives that described color and shape, thought to be more inherent to the noun, and relative properties including adjectives that described size and quality, thought to be less inherent to the noun (Sproat & Shih, 1991).

Recent work by Scontras et al. (2017) has returned to these meaning based theories, pointing to the subjectivity of an adjective as a possible explanation for adjective placement. Subjectivity is inherently quite personal, and was operationalized by Scontras using a faultless disagreement task, in which two participants are in disagreement about the description of a noun. The subjectivity of the descriptive adjective is measured according to how much one believes the two speakers could both be correct, or if one speaker must be wrong. In the faultless disagreement task, participants across different languages tend to rate color adjectives as less subjective, where speakers cannot both be correct, and size adjectives as more subjective. According to Scontras, the adjectives seemingly least subjective to a general audience are theorized to be placed closer to the noun, relative to other adjectives deemed more subjective.
The differentiation between inherent vs. residuum adjectives, or absolute and relative properties, informed the subjectivity divide proposed by Scontras et al. In a 2017 study combining experimental and corpus methods, Scontras found that the subjectivity of an adjective predicted its relative distance from the noun, with adjectives judged as less subjective being placed closer to the noun (Scontras et al., 2017). They had participants rate the “naturalness” of two combinations of adjectives with a noun, choosing which adjective felt more “natural” as a descriptor for the noun. Then, other participants rated how subjective they found the same set of possible adjectives. Around 70% of the time, the subjectivity of an adjective contributed to the variance in naturalness ratings of the adjective, showing that less subjective adjectives were seen as more natural when describing a noun than more subjective adjectives (Scontras et al., 2017).

This work only considered English examples, but the claim that subjectivity is instrumental in adjective ordering preferences could be especially interesting to a language such as Spanish, where lexical class descriptions may not be as strong of an indicator of AOPs. Initially, in work by Rosales and Scontras in 2019, it was claimed that subjectivity could not be an indicator of adjective ordering preferences in the Spanish language. Rosales and Scontras gathered subjectivity judgements from participants, and then acceptability judgements on multi adjective strings, and subjectivity was not found to indicate these ordering preferences (Rosales & Scontras, 2019). However, in a 2020 work, Scontras et al. returned to the idea of subjectivity predicting adjective ordering preferences in Spanish, citing one key error. In the study with Rosales in 2019, they defined the Spanish language as a language with post-nominal adjectives that require conjunction in multi-adjective strings (Rosales & Scontras, 2019). This was a generalization of post-nominal adjective use in Spanish. Although multi-adjective strings without conjunction have been noted as being less common (Demonte, 1999), previous work by Sánchez tested participants on multi-adjective strings without conjunction, and those phrases were judged as acceptable by participants (Sánchez & Camacho, 2021). Thus, Scontras et al. surveyed monolingual speakers once more on their acceptability judgements of multi adjective strings, but this time without conjunction, and subjectivity was found to be an indicator of AOPs. While the use of conjunction within multi adjective strings neutralizes AOPs, it does not get rid of AOPs entirely, and when conjunction is removed, subjectivity predicts how these preferences are
organized (Scontras et al., 2020).

When investigating subjectivity and AOPs in their study of Spanish, Rosales and Scontras also looked into the role of conjunction in AOPs in English. Conjunction, which is optional in the use of multi adjective phrases in the English language, has been theorized to neutralize adjective ordering preferences across languages (Ford & Olson, 1975). For example, the phrase “blue big bird” should be judged unacceptable, but “blue and big bird” should be fine. Wondering if conjunction neutralizes AOPs similarly in English as in Spanish, Rosales and Scontras replicated the work done by Scontras in 2017, where subjectivity was found to predict AOPs in English without conjunction, and added conjunction to some of the strings (Scontras et al., 2017). As in the 2017 study, subjectivity judgements predicted the ordering preferences of multi adjective strings without conjunction, but interestingly, subjectivity still had a significant effect on AOPs in multi adjective strings with conjunction. This is counter to the previous hypotheses of conjunction as a universal neutralizer of AOPs across languages. Rosales and Scontras explain this effect by focusing on the optionality of conjunction in multi adjective strings: because English speakers have encountered many multi adjective strings without conjunction where AOPs are based on subjectivity judgements, the regularity of these orderings bleed into the judgment of multi-adjective strings with conjunction (Rosales & Scontras, 2019).

The question of one scheme of ordering adjectives bleeding into another, as Rosales and Scontras raised in 2019, opens up speakers of multiple languages, who juggle the ordering preferences of multiple languages, as a point of inquiry. Zeinab Kachakeche and Gregory Scontras tackled the question with respect to Arabic, a post-nominal language, in 2020. First, subjectivity was found to predict the AOPs of monolingual Arabic speakers. Then, an experiment was designed to investigate if the influence of the dominant language, English, would cause heritage Arabic speakers to prefer to arrange their adjectives based on the linear order of English adjectives, rather than the subjectivity hierarchy ordering of Arabic. The results found that the subjectivity still predicted the ordering of AOPs in heritage Arabic, strengthening the claim that subjectivity judgements are a predictor of AOPs, even in the presence of cross linguistic influence (Kachakeche & Scontras, 2020). There are a few limitations to this study that would be important to explore further in relation to how AOPs appear for heritage speakers at large,
though. Primarily, when testing to see if subjectivity judgements predicted the AOPs of heritage Arabic, the subjectivity judgements used were those gathered from the monolingual Arabic speakers. The question of if subjectivity could vary between monolingual and heritage populations has not been addressed.

Subjectivity as a predictor for adjective ordering preferences brings us closer to the exciting potential of AOPs as a linguistic universal by linking them to our cognition. Studies on multiple languages illuminate this further, and heritage speaker studies can augment this conversation as well by providing a view into how strongly held these preferences are in light of different linguistic situations. These questions of heritage speakers will be returned to after further considerations of the heritage speaker experience, and how AOPs may be observed in language acquisition.

The Case of Heritage Speakers in Linguistic Study

Studying heritage speakers is a matter of urgent importance in linguistic study. “While testimonies as to the practical utility of learning English abound in all parts of the world, it is nevertheless undeniable that growth in English use leads inevitably to shift and loss of other languages” asserts Nancy Hornberger in her work *Literacy, language maintenance, and linguistic human rights: three telling cases* (Hornberger, 1997). In 2010, there were 50.5 million people of Hispanic heritage in the United States, making it the country with the second largest Spanish speaking population in the world, second only to Mexico (Muñoz-Basol, Moreno, Taboada, & Lacorte, 2016). This staggering number certainly demonstrates the pressing need to step away from Chomsky’s monolingual listener-speaker, and open our study to those who experience language in convergence. But beyond this number, the position of heritage speakers is a precarious one. The definition given earlier in the introduction of a heritage speaker, taken from Scontras et al. (2015), describes a heritage speaker as someone who primarily uses the dominant language rather than their heritage language (Scontras et al., 2015). The choice of “dominant” in this definition should not go unnoticed. We speak of dominant languages and heritage languages without directly addressing the power dynamic in place in their relation to each other. Hornberger expands her analysis to consider dominant languages more as predator languages - languages which put other minority languages at risk. While the heritage speaker population is
only growing in our time of globalization, it may be more apt to describe the population of heritage speakers as more and more speakers of minority languages existing in limbo (Hornberger, 1997). In this section, the definition of heritage speakers, or more so the difficulty of encountering a definition will be explored, as well as important considerations in the study of heritage speakers.

**Defining a Heritage Speaker**

Studying heritage speakers is a matter of urgent importance in linguistic study. “While testimonies as to the practical utility of learning English abound in all parts of the world, it is nevertheless undeniable that growth in English use leads inevitably to shift and loss of other languages” asserts Nancy Hornberger in her work *Literacy, language maintenance, and linguistic human rights: three telling cases* (Hornberger, 1997). In 2010, there were 50.5 million people of Hispanic heritage in the United States, making it the country with the second largest Spanish speaking population in the world, second only to Mexico (Muñoz-Basol et al., 2016). This staggering number demonstrates the pressing need to step away from Chomsky’s monolingual listener-speaker, and open our studies to include those who experience language in convergence. The position of heritage speakers is an especially precarious one. The definition given earlier in the introduction () of a heritage speaker, taken from Scontras et al. (2015), describes a heritage speaker as someone who primarily uses the dominant language rather than their heritage language (Scontras et al., 2015). The choice of “dominant” in this definition should not go unnoticed. We speak of dominant languages and heritage languages without directly addressing the power dynamic in place. Hornberger expands her analysis to consider dominant languages more as predator languages - languages which put other minority languages at risk. While the heritage speaker population is only growing in our time of globalization, it may be more apt to characterize heritage speakers as speakers of minority languages existing in limbo (Hornberger, 1997). In this section, the definition of heritage speakers, or more so the difficulty of encountering a definition will be explored, as well as important considerations in the study of heritage speakers.

**Defining a Heritage Speaker**

To recall, the working definition of a heritage speaker used so far has been some speaker who was exposed to one language in early childhood and then switched to primarily using the dominant language of their society later in childhood (Scontras et al., 2015). In her work
concerning the sociocultural dimensions of heritage language, and how exactly to study it, Agnes He explores the many methods of classifying heritage speakers. The term “heritage” points to family relevance, and is usually defined as having some ethnolinguistic affiliation to the language. Some definitions narrow this to speakers who were born in and lived in a country in which the heritage language is a dominant language for a considerable amount of time, and others leave the definition open to those who even have limited proficiency in the heritage language, and are further removed from it. As well, sometimes motivational qualities are brought into the definition of a heritage speaker, defining them as people who are motivated to keep up their heritage language. In the chapter on Spanish in the United States in *Introducción a lingüística hispánica actual*, heritage speakers are broken down into three “generations” based on time spent in the Spanish speaking country, as demonstrated in 6.

(6) a. G1: After puberty (up to 12 years old), learned Spanish in school.
b. G2: Born in the U.S. or moved to the U.S. before 6 months old.
c. G3: Those who have abandoned their patrimonial Spanish for English.

Schemes such as this, though very common in definitions of heritage speakers, demonstrate the difficulty of defining heritage speakers. There is no stage between G1 and G2, which encapsulates some of the critical period of language learning found for children (Penfield & Roberts, 2014). This schema leaves a gap in which cross linguistic effects could be occurring. As well, defining the third generation effectively in terms of motivation of the speaker ignores the predatory behavior of a dominant language environment towards a minority language (Hornberger, 1997). Definitions of heritage speakers seem to fall victim to trying to encapsulate an ever changing phenomenon in static terms. He settles on a definition that emphasizes the family relevance of a language, and the variety of language proficiency of heritage speakers (He, 2010). Furthermore, she moves to analyze the methodology of studying heritage languages.

**Considerations in the Methodology of Heritage Speaker Studies**

Considering the definition of heritage language and heritage speakers has been so muddy, the methodology for their study has been varied as well. In previously mentioned papers, different methods have been taken to determine the status of a heritage speaker. In papers like Sánchez
and Camacho (2021), a linguistic questionnaire as well as a proficiency exam were given to their participants. The proficiency exam was based on exams given to Spanish as a second language learners, and the linguistic questionnaire more open ended. Time in the U.S. educational system was also taken into account, given that many of the participants were in college or graduate school. Although a way of standardizing their composition of heritage speakers, the use of a proficiency exam for a heritage speaker does not accommodate for the ways that heritage speakerhood develop. Scontras et al. (2015) outlines three 'outcomes' of heritage/dominant language contact that could inform grammatical phenomena unique to heritage languages. When looking at grammatical phenomena, like Sánchez and Camacho (2021) did, heritage speakers who experience the outcome of divergent attachment (7b) may not be acknowledged in a study including a proficiency exam, which generally focus on grammatical concepts that might not be fully acquired outside of a school environment. For this reason, the present study refrained from using a grammatical ability test, and opted for a self reported questionnaire instead.

(7) Outcomes of Dominant Language Contact (Scontras et al., 2015)

a. Dominant Language Transfer: How does the grammar of the dominant language impact that of the heritage language?

b. Divergent Attachment: Heritage language weakened with increased socialization in and use of the dominant language.

c. Attrition: Loss of heritage language ability, either temporarily or permanently, in the dominant language environment.

Naturally, to study heritage speakers some definition has to be made. The use of a proficiency exam in this setting is understandable, but it leaves out the realities of many heritage speakers. This is the concern that He (2010) raises in respect to studies of heritage speakers so far: that work on heritage languages and speakers has been treating them too much as a static group, rather than a group impacted by multiple cultures and learning situations. He describes the majority of work on heritage languages as taking a correlational approach, in which sociocultural variables are understood as explanations for variation in heritage speaker language from the monolingual standard. Although these studies are useful in highlighting the factors
which impact heritage learners, such as motivation to maintain a heritage language, differing literacy or oral proficiency, socioeconomic status, and many more, they evaluate these factors in a numerical way, which makes them appear unchanging in the study. These studies have opened our understanding of heritage language, but also rely on taking generalizations of overwhelmingly fluid concepts (He, 2010).

Because of this limitation, He (2010) introduces the constructivist approach to heritage language study. Constructivism conceptualizes heritage language as a dependent variable, on which many independent variables act. Rather than understanding sociocultural factors as explanations for heritage language, they are described as outcomes of a heritage language environment, similar to the use of outcomes in the previous definitions by Scontras et al. (2015). Notable from this constructivism approach is a heightened emphasis on culture. Muñoz-Basol et al. (2016) emphasized the heritage speaker experience as bilingual and bicultural, and a constructivist approach understands this bicultural identity as crucial to the ways that factors like motivation are studied. How does a community culture impact the motivation a speaker has to pursue their heritage language learning? He says of the constructivist approach, “It refrains from universalizing and allows social and language behavior to speak for itself, without imposing predetermined definitions of essential characteristics of HL [heritage language] learners. (He, 2010). In the studies reviewed by He, a more specific undertaking relative to a linguistic phenomena was not reflected, but these questions are still important to have in mind when taking on the task of looking at heritage languages. Acknowledging the limitations that a correlational study can have when generalizing fluid sociocultural phenomena into a snapshot of time, we can begin to imagine what studying a process of linguistic change, like convergence of a heritage and dominant language, can look like.

It is pertinent to note that subjectivity theories of AOPs seem to be uncovering the more overarching concept of language change, and what underpins our grammars, rather than the simple correlational model between what language we observe, and how we can classify it. In a constructivist view, “Linguistic meanings and meaning makings are therefore necessarily embedded in cultural systems of understanding. An account of linguistic behavior must then draw on accounts of culture. (He, 2010). By moving beyond classes of adjectives and asking what
judgements are underpinning the formation and use of AOPs, judgements which may be culturally dependent, subjectivity theories better acknowledge the links between meaning making, culture, and linguistic phenomena.

Language acquisition as well is addressed in He (2010) as a site in which the varieties of heritage learning are visible. The acquisition of AOPs has been a recent point of linguistic study, and their implications in the study of heritage Spanish will be addressed in the following section. Methods used in acquisitionist approaches for the study of adjective ordering preferences greatly inspired the methods chosen in the present study, and sparked ideas for further work on heritage speakers.

**Acquisition of Adjective Ordering Preferences and Heritage Speakers**

As theories of adjective ordering preferences are proposed, there has been interest in how exactly we acquire these preferences within language acquisition. Recent studies by Bar-Sever (2018) and Grohe (2022) have applied the methodology of language acquisition work to AOPS, looking at how children use AOPs, and if their usage is like that of adults. In the case of heritage speakers, it has become clear that the childhood linguistic environment, the contrast between the language of socialization and that of the house, could be defining factors in the outcomes of the grammars of the speakers (see 7). The acquisition of adjective ordering preferences has yet considered populations beyond monolingual children, but interesting implications on adjective ordering preferences from children in heritage learning environments could be possible. A study on adjective placement by bilingual children will be reviewed, and the question of AOPs will be considered in the context of heritage speaker children.

**Studies on the Acquisition of Adjective Ordering Preferences**

Interested in how children develop adjective ordering preferences, Bar-Sever (2018) designed a corpus study looking at how children use AOPs. She had three potential hypotheses: that children create AOPs based on lexical class hierarchies, based on subjectivity, or based on a simple positional input frequency model, where children would base their AOPs on the frequency that adjectives appeared either directly adjacent to the noun, or one position away from the noun. She derived data from CHILDES, extracting AAN (adjective adjective noun) strings from children at ages two, three, and four. The lexical class hypothesis was based on 13 hierarchical
classes: a combination of the categories named by Dixon (1982) as well as Sproat and Shih (1991). For the subjectivity hypothesis, she crowdsourced subjectivity ratings for adjectives and averaged the scores. For the input frequency hypothesis, she found frequency scores for the data represented in the corpus. For ages two and three the input frequency hypothesis was found to be the most likely, with the lexical class and subjectivity starting to catch up in terms of likelihood by age three. At age four, the most likely hypothesis switches over to the lexical class hypothesis (Bar-Sever, 2018). The later abstraction of AOPs makes sense relative to the development of children: as children develop the capacity for understanding more abstract knowledge, they move from simpler hypotheses like input frequency, to basing their AOPs on something more abstract like lexical class. Bar-Sever (2018) predicts that the subjectivity hypothesis may take over lexical class even later in language acquisition, as there is evidence that children develop the ability to evaluate subjectivity much later in their cognitive development (Bar-Sever, 2018).

Grohe (2022) expanded on the work of Bar-Sever (2018), and examined two questions related to the use of adjectives by children. The first question of the study did not concern AOPs, but the second question asked if children showed the same AOPs for combinations of size-shape and shape-color adjectives. According to lexical class theories of acquisition, a clear preference for size-shape was expected from adults, and the shape-color condition was expected to have no clear preference. Researchers recruited 24 adults and 24 children to participate in the task and had them perform an elicited production task using pictures of items to prompt utterances. The frequency of utterances elicited was used to determine that both adults and children had a strong preference for size-shape utterances, but in both groups, there was no group preference between shape-color and color-shape utterances. In terms of shape-color preference though, it was found that there was strong individual preference between the two orders (Grohe, 2022).

**Acquisition of Adjective Ordering Preferences and Heritage Speakers**

As mentioned before, the work on the acquisition of AOPs is limited at the moment, but studies of bilingual or heritage learner acquisition of AOPs could be imagined. Recalling the outcomes defined by Scontras et al. (2015) in 7, and the study done by Sánchez and Camacho (2021), one come imagine analyzing how AOPs are determined by children of varying ages, and seeing if their judgements line up with those of English monolingual children or non dominant
language monolingual children. Are heritage speaker children shifting to a new hypothesis of determining AOPs at a different time than their monolingual peers? Is the lexical class ordering of AOPs applied to the non dominant language, and then changed at a later point in childhood? Or, one could look at children within the transition between heritage speaker environment, maybe recently being socialized in a dominant language environment. A longitudinal study of a childhood in which a speaker is more and more immersed in a dominant language environment may reveal interesting cross linguistic effects. As children undergo a bicultural upbringing, juggling two cultures of meaning, how subjectivity judgements develop and then inform AOPs could be an illuminating point of study.

The influence of bilingualism on adjective preferences is touched on in a study done by Nicoladis (2006), where the production of AN (adjective noun) sequences in French and English by children were analyzed for a cross linguistic effect. Though this study is not concerned with adjective ordering preferences, its conclusion points to an important factor in the consideration of bilingual children. It has been previously hypothesized that any cross linguistic transfer between languages would be due to a structural overlap or ambiguity (Hulk & Müller, 2000). Based on this prediction, the researchers expected that the children would commit errors and produce constructions where adjectives which should usually be placed in the post-nominal position would be produced in the pre-nominal position instead, like how they would be used in English. This effect was supported in the evidence, but two other other effects as well. The children also made more reversals of pre-nominal adjectives in French, as well as more reversals of post-nominal adjectives in English. Based on these findings, the researchers propose that children make generalizations of each language, simplifying their rules to a simple pre-nominal adjective rule for English and a post-nominal rule for French, thus making errors in both languages. They propose this as a bilingualism effect specifically, rather than a cross linguistic effect, an effect born from the specific conditions of bilingualism (Nicoladis, 2006). This reflects a more constructivist approach to the study of bilingualism (He, 2010). Perhaps the question of cross linguistic effects is not the most compelling question to be asked, and phenomena specific to bilinguals, or specific to heritage speakers, may be more fruitful paths of discussion.

Acquisition work illuminates how early bilinguals, like some heritage speakers, may be
experiencing changes to their adjective use in early childhood. In contrast to later bilinguals, these changes are happening within the sensitive period of language development. This motivates my interest in heritage speakers specifically as bilinguals, as they may be speakers whose languages were fundamentally changed in childhood. The present study is a preliminary step in exploring the language of this critically positioned linguistic population further.

Methods

The Present Study

The current study aims to explore if there are adjective ordering preferences present in heritage Spanish speakers, in both their English and Spanish language use, as well as if these preferences are predicted by subjectivity judgements. These questions have been asked of monolingual populations, but no study has yet focused distinctly on the Spanish heritage speaker identity (Scontras et al., 2020). As explored in definitions of heritage speakers, predominant languages are at times described as predatory languages (Hornberger, 1997). By looking at both heritage Spanish speakers Spanish language use and their English language use in the context of adjective ordering preferences, comparisons will be able to be made between the use of the predominant and predatory languages. I am interested in if a cross linguistic effect can be observed between the heritage language of Spanish and the predominant language of English.

These experiments intend to address the following questions. First, do heritage speakers of Spanish have adjective ordering preferences, in Spanish and/or English? Second, do subjectivity judgements of heritage speakers of Spanish predict their AOPs? This will build off work by Scontras et al. (2017) and Rosales and Scontras (2019), which have found subjectivity to predict AOPs in both English and Spanish. In work by Kachakeche and Scontras (2020), heritage Arabic adjective ordering preferences were predicted by monolingual speaker subjectivity judgements, but heritage speaker subjectivity judgements have not yet been collected. This leads into the third question, which asks if the subjectivity judgments of either English or Spanish differ from those observed in monolingual speakers. Furthermore, do they predict the adjective ordering preferences in the other language? Looking at subjectivity judgments cross linguistically will be a unique chance to see if these judgements are shared across languages, or if they vary between the languages that a bilingual speaker uses. I predict that subjectivity will be shown as a predictor of
AOPs in heritage speakers of Spanish, as it has been supported for monolingual speakers. In the case of subjectivity judgements, I predict that heritage speakers of Spanish will have subjectivity judgements that show similarities with those of monolingual English speakers, due to their predominant use of English, and the previously described ‘predatory’ effect that English may have on their heritage Spanish (Hornberger, 1997).

Heritage speakers are defined in this study as speakers who used Spanish in predominantly in their childhood. I determined this based on self reporting from participants, looking for those who reported speaking Spanish to their parents as children, or using it at least half of the time in childhood. This definition was guided by the definitions explored in He (2010) and Scontras et al. (2015). Working with subjectivity judgements, which are likely learned in early childhood, motivated the focus on heritage speakers who had childhoods centered around the Spanish language (Bar-Sever, 2018). As well, to focus on the ‘predatory’ effect the predominant language of English may have on these speakers, I focused my analysis on Mexican heritage speakers of Spanish living in the United States and speaking English in their daily life. This was motivated by an understanding of the diversity of heritage speakers of Spanish residing in the United States. The Spanish language across Latin America and South America is anything but a monolith (Mouton, 1992). Because of this study’s focus on subjectivity judgements, the scope of the study was narrowed to one country in the hope of eliminating the influence that different cultural conceptions of subjectivity may have on these judgements. This is not a perfect choice, as defining culture in terms of country boundaries is a gross oversimplification, and there is rich cultural variety within Mexico (Batalla, 2022). Deciding how to best narrow the definition of heritage speakers used in this study shed light on the limitations of using empirical investigation to capture realities of language use which are so closely tied to culture (He, 2010). Even so, understanding how heritage speaker identity impacts AOPs and other phenomena has not been adequately explored in the field, and any work in this direction will help illuminate the language use of this understudied population. It is my hope that by furthering research on the language of heritage speakers, more consideration will be given to how best to study their experience in empirical investigation, and further studies will be able to build on the present definitions.
Experiment One: Establishing Naturalness Measures

To begin, I asked if heritage speakers of Spanish had adjective ordering preferences in their Spanish or English language use. This was done through a naturalness judgement task first done in Scontras et al. (2017), and repeated in Rosales and Scontras (2019) and Scontras et al. (2020). Naturalness judgments were determined for a set of 15 adjectives, selected from a set of 26 adjectives first used in Scontras et al. (2017) in English, and then translated in Rosales and Scontras (2019). The selection of 15 was chosen across five categories originally focused on by Scontras in 2017 - age, color, value, size, shape, and texture. The category of material adjectives was excluded from my analysis. A smaller selection of adjectives were chosen from the color, age, and size categories. This was due to the limited scope of this experiment. Both sets of adjectives are shown in table 1 and table 2, respectively.

(8)

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Table 1

A selection of English adjectives first used in Scontras et al. (2017).

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3 Material adjectives were excluded due to a discrepancy between the inclusion of nationality and material adjectives across English and Spanish versions of the study originally done by Scontras et al. (2017).

4 Adjectives were chosen from the original set in Scontras et al. (2017), exclusions made based on consultation with Professor Perez de Mendiola on the uncommon use of certain adjectives in Spanish (i.e., minúsculo (tiny), a diminutive form of small is more common).
Table 2


These adjectives were displayed with a nonce word noun. This differs from the approach in past studies, which used a set of nouns from either furniture or fruit categories. Rather than choose a more limited set of nouns from these previous studies, which would increase the chances that judgements of an individual noun may impact the answers given, a nonce word was chosen to be used in all experiments. These nonce words were chosen from past literature in either language - “greeble” for English and “taplino” for Spanish - to ensure that they were convincingly similar to nouns of the language (Faber & Amaral, 2024; Gauthier & Tarr, 1997).

Participants

50 heritage Spanish speakers of Mexican heritage were recruited through Connect via CloudResearch to take the survey in English. 32 participants were identified as heritage speakers of Spanish. 50 more heritage Spanish speakers of Mexican heritage were recruited to take the survey in Spanish. 43 participants were identified as heritage speakers of Spanish. Heritage speaker status was verified through the demographics questionnaire answered by the

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5 Though past studies were conducted via Amazon MTurk, concerns about data quality have been raised, and CloudResearch was proposed as an alternative for ease of recruitment (Hauser et al., 2022).
participants at the end of the survey. All participants were compensated for their participation.

**Methods**

All surveys were administered via Qualtrics, participants were redirected via CloudResearch Connect. Surveys were equivalent between the English and Spanish versions. Participants were asked which of two descriptions of an object sounded more natural. These descriptions were random pairs of two adjectives and one noun from Table 1 (8) or Table 2 (9), depending on the language of the survey, with the restriction that the two adjectives did not come from the same semantic class. The descriptions were shown as the endpoints of a slider, where the adjective order was reversed on either side. Examples of experiment one trials, in both English and Spanish, are shown in figure 1.

![Figure 1](image)

*Example trial from experiment one, both English and Spanish language versions.*

Participants used a slider to judge which description of the two sounded most natural. The distance of the slider from each endpoint was measured to generate a measure between 0 and 1. To calculate naturalness scores, ratings of a given adjective when it was in the position farthest from the noun in either language, were averaged. Higher values indicated that the adjective was preferred further from the noun, and lower values indicated it was preferred closer.
Experiment Two: Subjectivity Judgements for Heritage Speakers of Spanish

After establishing if AOPs are present in either heritage speaker English or Spanish use, I asked heritage speakers about their subjectivity judgements for the 15 adjectives used previously. This was done using a faultless disagreement task, first used in Scontras et al. (2017), then repeated in Rosales and Scontras (2019) and Scontras et al. (2020). This experiment was repeated three times to compare the subjectivity judgements of heritage speakers of Spanish in English and Spanish, against monolingual speakers of English. I proposed to compare the subjectivity judgements of monolingual English and Spanish with those of heritage speakers of Spanish to explore the possibility of a cross linguistic effect between English and Spanish in heritage speakers. To accurately observe this cross linguistic effect, it was necessary that the comparison judgements from English and Spanish be from monolingual speakers. Due to the limited geographical scope of CloudResearchs Connect software, I was unable to collect subjectivity judgements for monolingual speakers of Spanish from Mexico. Thus, I was only able to make comparisons between monolingual English speakers and heritage Spanish speaker English. The three surveys completed were as follows: monolingual English speakers judging the subjectivity of English adjectives, heritage speakers of Spanish judging the subjectivity of English adjectives, heritage speakers of Spanish judging the subjectivity of Spanish adjectives.

Participants

50 monolingual, native English speakers were recruited for the survey on English adjectives. 39 participants were identified as monolingual, native English speakers. 50 heritage Spanish speakers of Mexican heritage were recruited for the survey on English adjectives. 35 participants were identified as heritage Spanish speakers. 50 more heritage Spanish speakers of Mexican heritage were recruited for the survey on Spanish Adjectives. 32 participants were identified as heritage Spanish speakers. All participants were recruited through Connect via CloudResearch. Either monolingual or heritage speaker status was verified through the demographics questionnaire answered by the participants at the end of the survey. All participants were compensated for their participation.
Methods

All surveys were administered via qualtrics, participants were redirected via CloudResearch Connect. Surveys were equivalent between the English and Spanish versions. Participants were asked to complete a faultless disagreement task, which was modeled off the task first done by Scontras et al. (2017) for the English language, and then replicated by Rosales and Scontras (2019) for Spanish. Descriptions of short dialogues between two speakers were shown, in which they disagreed about property descriptions of a nonce word. Examples of experiment two trials, in both English and Spanish, are shown in figure 2.

![Figure 2](image)

*Figure 2*

*Example trial from experiment two, both English and Spanish language versions.*

The same nonce words as described in experiment one were used, for each respective language. Participants used a slider scale to judge if the two speakers could be right even with diverging statements - one end of the slider (0) was labeled as ‘no, somebody was wrong’ and the other end (1) was labeled as ‘yes, both might be right’. Participants completed 15 trials, one for each of the adjectives in either Table 1 (8) or Table 2 (9), depending on the language of the survey. The order of these trials were randomized across participants. For each adjective, a mean subjectivity score was calculated by averaging the faultless disagreement ratings from the participants.
Comparing Adjective Ordering Preferences With Subjectivity Judgements

In Scontras et al. (2017) and Scontras et al. (2020), it was determined that subjectivity judgements predicted the adjective ordering preferences for both native English speakers and native Spanish speakers. This was done by plotting the mean naturalness ratings against the mean subjectivity scores of each adjective. With results from experiments one and two, we were able to plot mean naturalness scores for heritage Spanish speaker Spanish against the subjectivity scores from heritage Spanish speakers for adjectives in Spanish, as well as the mean naturalness scores for heritage Spanish speaker English against the subjectivity scores from heritage Spanish speakers for adjectives in English.

Results

After data was collected for all five surveys administered via CloudResearchs Connect, data was organized and statistical analyses were conducted in Excel. A Python program was used to conduct resampling with replacement, which was used to calculate confidence intervals. For each experiment, results from heritage speakers of Spanish completing either the Spanish or English version of the experiment will be reported. English monolinguals will be considered in comparison to heritage speakers in experiment two.

Experiment One: Establishing Naturalness Measures

English language version

For each of the 15 adjectives in table 8, I calculated a mean preferred-distance measure, which averaged how far each adjective was preferred from the noun across participants. Figure 3 plots ordering preferences grouped by adjective semantic class. Greater values indicate that a class’s adjectives are preferred in the first position, furthest from the noun, whereas lower values indicate that they are preferred closer. The results indicate that heritage Spanish speakers present adjective ordering preferences in their English language use, preferring some classes of adjectives (i.e. size, value) further from the noun than others (i.e. color, shape).

Spanish language

For each of the 15 adjectives in table 9, I calculated a mean preferred-distance measure, which averaged how far each adjective was preferred from the noun, across participants. Figure 4
plots ordering preferences grouped by semantic class. Akin to figure 3, greater values indicate that a class's adjectives are preferred in the first position, furthest from the noun, whereas lower values indicate that they are preferred closer. The results indicate that heritage Spanish speakers present adjective ordering preferences in their Spanish language use, although these preferences are weaker than their English ordering preferences. Some classes are preferred further from the noun (i.e. value, texture) than others which are preferred closer (i.e. shape, color), but some are not significantly different from each other, in the case of size and age. This reflects prior work which indicated some classes of adjectives may have flexible ordering preferences (Pérez-Leroux et al., 2020).

Experiment Two: Subjectivity Judgements for Heritage Speakers of Spanish

English language version

For each of the 15 adjectives from table 8, a mean perceived subjectivity score was computed by averaging faultless disagreement ratings across participants. Figure 5 plots perceived subjectivity scores grouped by adjective semantic class. Higher values indicate that a class's adjectives are considered more subjective, and lower values indicate that they are considered less subjective. These results indicate that heritage Spanish speakers consider distinct classes of adjectives in English to differ in how subjective they are.

Spanish language version

For each of the 15 adjectives from table 9, a mean perceived subjectivity score was computed by averaging faultless disagreement ratings across participants. Figure 6 plots perceived subjectivity scores grouped by adjective semantic class. Akin to the figure 5, higher values indicate that a class's adjectives are considered more subjective, and lower values indicate that they are considered less subjective. These results indicate that heritage Spanish speakers consider distinct classes of adjectives in Spanish to differ in how subjective they are.

Comparison with English Monolinguals

As well, subjectivity judgements were collected from English monolinguals using the same faultless disagreement task. Figure 7 plots the subjectivity judgements of heritage Spanish speakers for their English language use alongside the subjectivity judgements of English
Figure 3

Naturalness ratings from Experiment one for heritage Spanish speakers completing the survey in English. Results are grouped by adjective semantic class. Error bars represent bootstrapped 95% confidence intervals drawn from 10,000 samples of the data (DiCiccio & Efron, 1996).

Figure 4

Naturalness ratings from Experiment one for heritage speakers of Spanish completing the survey in Spanish. Results grouped by adjective semantic class. Error bars represent bootstrapped 95% confidence intervals drawn from 10,000 samples of the data (DiCiccio & Efron, 1996).
Faultless disagreement ratings from experiment two for heritage speakers of Spanish completing the survey in English. Results are grouped by adjective semantic class. Higher values indicate that a class of adjectives are considered more subjective. Error bars represent bootstrapped 95% confidence intervals drawn from 10,000 samples of the data ((DiCiccio & Efron, 1996)).

Faultless disagreement ratings from experiment two for heritage speakers of Spanish completing the survey in Spanish. Results are grouped by adjective semantic class. Higher values indicate that a class of adjectives are considered more subjective. Error bars represent bootstrapped 95% confidence intervals drawn from 10,000 samples of the data ((DiCiccio & Efron, 1996)).
monolingual speakers. These preferences are very similar, demonstrating that adjective ordering in English by heritage speakers of Spanish is comparable to that of their monolingual peers.

Furthermore, all three sets of subjectivity ratings are plotted alongside each other in figure 8. This figure demonstrates the similarities in subjectivity judgments cross linguistically, as well as between monolingual and heritage speaker populations. Although much of the figure is similar, a notable difference is found in the higher levels of subjectivity for the Spanish language of heritage Spanish speakers in the adjective class of color and of shape.

Comparing Adjective Ordering Preferences With Subjectivity Judgements

**English Language Results**

Naturalness ratings gathered in experiment one indicate the existence of AOPs in English language use by heritage Spanish speakers. Plotting these results against the English subjectivity ratings from experiment two, it was found that subjectivity accounts for 45% of the variance in adjective ordering preferences in English language use by heritage Spanish speakers ($r^2 = 0.4478$). This aligns with past studies showing subjectivity as a reliable predictor of AOPs in monolingual English (Scontras et al., 2017). Figure 9 shows each adjective’s naturalness rating plotted against their subjectivity scores.

**Spanish Language Results**

Naturalness ratings gathered in experiment one indicate the existence of AOPs in Spanish language use by heritage Spanish speakers. Plotting these results against the Spanish subjectivity ratings from experiment two, it was found that subjectivity accounts for 27% of the variance in adjective ordering preferences in English language use by heritage Spanish speakers ($r^2 = 0.2707$). This is a relatively low value, indicating that subjectivity is not a robust predictor of AOPs for the Spanish language for heritage Spanish speakers. Figure 10 shows each adjective’s naturalness rating plotted against their subjectivity scores.

**Discussion**

My results determined that in their English and Spanish language use, heritage speakers of Spanish both present AOPs, and these preferences are predicted to a certain extent by their subjectivity judgements. The existence of AOPs in this population furthers the study of AOPs as
Figure 7
Faultless disagreement ratings from experiment two for heritage speakers of Spanish completing the survey in English as well as results from monolingual English speakers. Results are grouped by adjective semantic class. Higher values indicate that a class's adjectives are considered more subjective. Error bars represent bootstrapped 95% confidence intervals drawn from 10,000 samples of the data (DiCiccio & Efron, 1996).

Figure 8
Faultless disagreement ratings from experiment two for all populations who completed the survey (heritage speakers of Spanish in both English and Spanish, and monolingual English speakers). Results are grouped by adjective semantic class. Higher values indicate that a class's adjectives are considered more subjective. Error bars represent bootstrapped 95% confidence intervals drawn from 10,000 samples of the data (DiCiccio & Efron, 1996).
Figure 9

*English adjective ordering preferences from heritage speakers of Spanish plotted against English adjective subjectivity scores from heritage speakers of Spanish for the 15 adjectives test. Subjectivity accounts for 45% of the variance in the ordering preferences (r squared = 0.4478).*

Figure 10

*Spanish adjective ordering preferences from heritage speakers of Spanish plotted against Spanish adjective subjectivity scores from heritage speakers of Spanish for the 15 adjectives test. Subjectivity accounts for 27% of the variance in the ordering preferences (r squared = 0.2707).*
ADJECTIVE ORDERING PREFERENCES FOR HERITAGE SPANISH SPEAKERS

a potential linguistic universal, and adds another population to a small number of studies which have looked at AOPs from a multilingual perspective (Kachakeche & Scontras, 2020). Much of the work on AOPs has focused on determining their existence across different languages by studying native speaker populations, and they have not often considered the use of multiple languages within one population (Scontras et al., 2020). It would be remiss to exclude multilingual speakers from the conversation on linguistic universality, whose multilingual experience may change their use of either language. Linguistic universals are thought to point to what language capabilities may be inherent to all languages - if multilingual speakers differed in their use of a proposed universal between their two languages, there would be reason to believe that the proposed universal may be more specific language dependent, rather than a generally shared language capacity. For this reason, determining that heritage Spanish speakers present AOPs in both their English and Spanish use, even considering the difference between a prenominal and a postnominal language, furthers the assertion that AOPs may be a linguistic universal.

The subjectivity ratings collected from heritage Spanish speakers for both English and Spanish adjectives predicted the AOPs of either language. These predictions were stronger in the case of English ($r^2 = 0.4478$) than in Spanish ($r^2 = 0.2707$). In both cases, the predictions were weaker than monolingual studies done previously: for English, Scontras et al. (2017) found English AOPs to be predicted 88% by subjectivity ratings from a faultless disagreement task similar to that of experiment two, and for Spanish, Scontras et al. (2020) found AOPs to be predicted 56% by subjectivity ratings. When looking at heritage speaker Arabic in an equivalent experimental design, Kachakeche and Scontras (2020) found a comparably weak prediction of AOPs by subjectivity ($r^2 = 0.26$). Their work plotted heritage Arabic speaker naturalness ratings against monolingual subjectivity scores, and he predicted that having heritage speaker subjectivity scores would improve how much subjectivity predicted AOPs. My findings do not follow that prediction: when plotting naturalness ratings and subjectivity scores from heritage speakers, I found nearly equivalent results to theirs of heritage Arabic speakers. From this collection of data, it could be theorized that the AOPs of heritage speakers are generally dampened in comparison to their monolingual peers, or that subjectivity is not as reliable of a predictor of AOPs in the case of heritage speakers. Still, the fact that subjectivity predicts the AOPs in both languages, even if to
a lesser extent, supports the theory that subjectivity of an adjective may play a role in these preferences, and could be behind the existence of AOPs as a potential linguistic universal.

Subjectivity ratings collected from English monolingual speakers were very similar to those collected in English from the heritage Spanish speakers, and interestingly quite similar to ratings in Spanish from the heritage Spanish speakers as well. Though ratings for classes considered more subjective were slightly dampened in the case of heritage speaker Spanish use, classes considered less subjective for both monolingual and heritage speaker English use, particularly color and shape, were considered more subjective to the heritage Spanish speakers taking the survey in Spanish. I was not able to compare this to a monolingual Spanish baseline myself, but looking at previous work by Scontras et al. (2020), I do not see the same jump in considering color and shape more subjective. These two categories, color and shape, also had near equivalent average subjectivity scores - averages of 0.34 and 0.33, respectively. Previously, Pérez-Leroux et al. (2020) has explored how some classes of adjectives seem to have free ordering between them. This study specifically looked at relational adjectives, like nationality, as having more free ordering than adjectives classes those considered in this study, which she classified as modifying the noun more fundamentally. Based on my findings for heritage speakers, it could be fruitful to see if there is flexibility in ordering more modifying adjectives in kinds of bilingual Spanish as compared to monolingual Spanish.

Looking at the bigger picture once more, the similarity in subjectivity judgements across the three populations tested in experiment two indicates that semantic subjectivity of an adjective itself is a more inherent aspect of language, maybe even than whatever specific language is being spoken. Even if AOPs being a linguistic universal is still an open question, subjectivity as a predictor of these preferences seems to be a good road to be following, as it is an aspect of language capacity in multilingual speakers that transcends whatever specific language is being spoken. Figures 11 and 12 support this, as they show the AOPs of either English or Spanish as reported by heritage Spanish speakers, plotted against the subjectivity ratings of the opposite language. The subjectivity ratings from the opposite language predict the naturalness ratings of the other language just as well: for Spanish, the Spanish subjectivity ratings predict AOPs in Spanish 27% of the time (refer to figure 10), and the English subjectivity ratings predict AOPs in
Spanish 29% of the time; for English, the English subjectivity ratings predict AOPs in English 45% of the time (refer to figure 9), and the Spanish subjectivity ratings predict AOPs in English 47% of the time.

![Figure 11](image)

*Figure 11*

*English language adjective ordering preferences plotted against Spanish adjective subjectivity ratings, both collected from heritage Spanish speakers (r squared = 0.4746)*

![Figure 12](image)

*Figure 12*

*Spanish language adjective ordering preferences plotted against English adjective subjectivity ratings, both collected from heritage Spanish speakers (r squared = 0.2869)*

This indicates that the subjectivity ratings given by heritage speakers of Spanish are consistent across the languages they speak. Even if these levels of prediction are different, I still find it notable that subjectivity ratings play a role in both of the languages a heritage population
is speaking. Although it may logically follow that a speaker’s inherent understanding of subjectivity does not change between the languages they use, the question had not been sufficiently addressed in this context yet, and my results verify that instinct. Subjectivity may not only be a consistent predictor of AOPs across language populations, but also across the individual languages a multilingual speaker uses, indicating its role in AOPs could be a universal ingredient in our capacity for language.

Limitations

There are some limitations to take into account when considering the results of this study. A number of these are related to the participant population, and information collected or not collected from them. The population size for each of my five surveys was relatively small, ranging from 32 to 43 participants. This is comparable to population sizes from some studies similar to mine (Kachakeche & Scontras, 2020; Rosales & Scontras, 2019). The small population size motivated my use of resampling with replacement for results of both experiment one and two. Taking this a step further, Scontras et al. (2017) completed a corpus verification of their English language adjective ordering preference results. A methodology of this sort, or a larger participant pool, would further validate the results gained from this study. As comprehensively covered in the literature review, the definition of heritage speaker is a flexible term, and this variability introduces the chance that my participant pool included a wide range of Spanish and/or English abilities. I excluded participants based on their self reported Spanish language history in the post survey demographics questions (Appendix B). Because the data was self reported, this may have introduced unnecessary noise into my data, impacting the precision of results I reported. To avoid this, it would have been wise to include either a language ability test such as those references in Sánchez and Camacho (2021) or even a smaller task, such as those done by Kachakeche and Scontras (2020). These tests were decided against due to worry that grammatical questions may excluded heritage speakers who received less traditional education in their heritage language (Scontras et al., 2015). Even without test of this sort, the results from Kachakeche and Scontras (2020) which included a language ability verification task were quite similar to those I received, which leads me to believe that the participant questionnaire worked somewhat well.

Lastly, a limitation in my study, as well as those which I modeled my work on, relates
once more to how speaker populations were found and defined. In the original work by Scontras et al. (2017), native English speakers were the target population, with no specific qualification made that these speakers be monolingual. Similarly for Spanish studies done by Rosales and Scontras (2019) and Scontras et al. (2020), no monolingual qualification was included when recruiting participants. This is a point on which I tried to improve my own study by using CloudResearch Connects demographic targeting for monolingual or bilingual populations when applicable for each survey, and verifying these choices through my self reported demographics questions. Still, my questions and targeting only concerned the English and Spanish languages, and did not consider a speaker with more languages than these two. Just as heritage and bilingual experiences are increasingly common, a multilingual experience is as well, and future versions of studies like this on AOPs should be careful to clearly define and target their populations of interest, if they would like to avoid influence from languages outside of the study.

As well, the methods chosen for this project were restricted by the scope of a senior thesis assignment. I elected to administer my surveys using Qualtrics software, which was available through my department. This differed from previous studies which used a customized Javascript website (Scontras et al., 2020). Previous experimental design randomized the questions which appeared to a participant, likely using Javascript to create these questions each time a participant accessed the survey. Qualtrics required the hand creation of each question in advance, which to maintain the even randomization of the adjective pairs appearing to participants, necessitated that the adjective selection be smaller than previously done. This was more of a human limitation than one of the experimental design: theoretically, hundreds of Qualtrics questions could be created in advance for each survey, but as one researcher this was not a possible or productive use of time. Limiting my selection of adjectives, though, does introduce some more noise into my data. Only having two adjectives to represent a varied category like color, for instance, makes me wary of coming to any larger conclusions about speaker attitudes towards that category as a whole based on my results. I elected to remove the material or nationality category from this study as well, partially based on the existing discrepancy between studying materials and

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6 Spanish monolingual populations were unable to be tested in this study due to the geographical limitations of CloudResearch Connects participant pool
nationalities between English and Spanish versions of the survey, as well as due to my limitations of survey scope.

Additionally, I elected to use nonce words rather than a selection of nouns, as done in previous versions of similar studies, when creating my surveys. This was due to the limitations introduced when using Qualtrics rather than a Javascript programmed webpage. I included a description of the concept of a nonce word at the start of each survey, advising each participant to treat the corresponding nonce word as they would any other noun in their language. Care was taken to find nonce words which are similar to nouns of English or Spanish (Faber & Amaral, 2024; Gauthier & Tarr, 1997). I find it encouraging that my English monolingual results for the experiment are similar to those found in Scontras et al. (2017), as this indicates that the nonce word and any confusion associated with the concept may not have strongly impacted the results gained in my surveys. Still, nonce words introduce the chance that participants are confused by the made-up nature of the word, and may be treating it differently in the trials than they would a common noun. This element of confusion is not entirely unlike some of the confusion which is introduced in other versions of the study: in versions which use a noun list including nouns like "TV" and 'apple', there is a chance for descriptions like 'The short blue apple' or "The good soft TV" (Scontras et al., 2017). It may be unlikely that a version of this study could eliminate any amount of confusion from pairings of these adjectives with a noun, made-up or real, and it is important to consider the role this confusion may play in the interpretation of my results.

**Conclusion**

My work has shown that AOPs are present in the English and Spanish used by heritage Spanish speakers, and that these preferences are predicted by subjectivity judgements of heritage Spanish speakers, although to a lesser extent than their monolingual counterparts. In working with heritage speaker data, I hoped to shed light on how a multilingual upbringing, especially in early childhood, may impact the language of these speakers. Although the presence of AOPs was maintained in both languages, the fact that subjectivity is less effective as a predictive measure

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7 In Rosales and Scontras (2019) and Scontras et al. (2020), nationality adjectives were substituted for material adjectives, as used in Scontras et al. (2017), as material descriptions are not formed with adjectives in Spanish, rather using the construction de (of) + material noun.
aligns with other work on heritage speakers of post nominal languages (Kachakeche & Scontras, 2020). When considering adjective ordering preferences as a potential linguistic universal, and hypothesizing that subjectivity may be behind these preferences, it is important to consider how this measure of subjectivity may look different for multilingual speakers in comparison to their monolingual peers. Additionally, understanding that the conceptions of adjective subjectivity seems to stay constant across the languages a heritage speaker is using, speaks to previous theories that subjectivity of adjectives is a concept gained earlier in childhood (Bar-Sever, 2018).

**Future Directions**

Reflecting on the results of this study, I am still interested in what kind of multilingual experience may impact the presence of adjective ordering preferences in a speaker. Subjectivity was focused on as a predictor of adjective ordering preferences in this study due to the intriguing past work which found it strongly predicted both native English and native Spanish preferences. Yet, in past work on heritage speakers, it was not found to be as strong of a predictor. For this reason, I would be interested in moving from a focus on subjectivity predicting adjective ordering preferences, to an approach which could investigate other theories of adjective ordering preferences, like those mentioned in 2. In work by Bar-Sever (2018) previously mentioned in the literature review, three kinds of adjective ordering preferences theories were analyzed in the case of child language data from multiple ages, to determine which theory matched to the data more accurately. I'd be interested in applying a similar approach to heritage speaker data, and investigating if something like a class theory from Dixon (1982) or Cinque (2010) is more or less effective in predicting heritage speaker data than subjectivity ratings.

Looking at multilingualism more broadly than the heritage speaker experience would provide another interesting window into the concept of adjective ordering preferences as well. Do heritage speakers, because they are very early bilinguals, have subjectivity predict their adjective ordering preferences more than other bilinguals, who may rely more on rule based knowledge of adjective ordering? Or, are subjectivity ratings a weak predictor for all bilinguals, and could this have something to do with their bilingual status? Also, heritage speaker Spanish was predicted to a lesser extent by subjectivity ratings than English: would this happen in cases where the dominant, predatory was different? In other words, does it matter what languages a multilingual
speaker is using when considering their adjective ordering preferences? Although these questions are particular to the subject of adjective ordering preferences, they could be easily applied to other areas of linguistic study which investigate multilingual populations, or have not yet considered them. It is my hope that my work will help motivate further studies such as these into the particularities of multilingual experiences, heritage and otherwise.
Appendix A

Appendix A - Survey Instructions

Survey 1 - English

You will be presented with two adjectives describing a made-up noun and will be asked to rate how natural this description sounds. Treat the made-up noun in the same way that you would treat a real noun.

For each pair of adjectives, indicate which order of these adjectives seems most natural when describing the made-up noun. Answer with your best judgment of which sounds most natural of the pair.

Survey 1 - Spanish

Se le presentarán 13 ejemplos de dos adjetivos que describen un sustantivo inventado y se le pedirá que califique lo natural que suena cada descripción. Tratar el sustantivo de la misma manera que trataría un sustantivo real.

Para cada par de adjetivos, indica cuál orden de estos adjetivos parece más natural para describir el sustantivo. A veces ninguna de estas descripciones suena natural o describe un objeto real. Responda con su mejor juicio al indicar qué suena más natural entre las dos opciones.

Survey 2 - English

You will be presented with a short dialogue in which speakers disagree about the description of a made up noun and will have to rate if you believe the two speakers could both be correct. Treat the made-up noun in the same way that you would treat a real noun.

For each dialogue, indicate on the slider where your opinion lies between 0 one participant must be wrong, and 1 both speakers could be correct. Both speakers being correct may mean that they hold different opinions, and both descriptions could be true to each of them. One speaker being wrong would mean that the two speakers would not be able to describe the made up noun differently, or that the description could not be ambiguous. Answer with your best judgment, there is no right answer.
Survey 2 - Spanish

Se le presentará un breve diálogo en el que los participantes no están de acuerdo sobre la descripción de un sustantivo inventado, y tendrá que calificar si cree que los dos oradores podrían tener razón. Tratar el sustantivo de la misma manera que trataría un sustantivo real.

Para cada diálogo, indique en el guión de separación deslizante a qué nivel se encuentra su opinión entre 0 - un participante con respuesta incorrecta, y 1 ambos participantes podrían tener respuestas correctas. Si ambos participantes tuvieran las respuestas correctas puede significar que tienen opiniones diferentes, y ambas descripciones podrían ser fiables a cada uno de ellos. Si un participante fuera incorrecto significa que los dos oradores no podrían describir el objeto de manera diferente, o que la descripción no podría ser ambigua. Responda con su mejor juicio, no hay respuesta correcta.
Appendix B

Appendix B - Demographic Questionnaire

(* indicates a required question)

**English Version**

*Native Language (the language(s) spoken at home when you were a child):

*Country of Birth:

*(for heritage Spanish speakers) Do you identify as Hispanic, of Mexican heritage?

Describe how you learned the Spanish language:

How often do you currently use the Spanish language?

Age:

Level Of Education:

  Some High School
  Graduated High School
  Some College
  Graduated College
  Hold a higher degree

**Spanish Version**

*Idioma nativo (el idioma(s) hablado en casa cuando usted era niño):

*País de nacimiento:

*¿Te identificas como hispano, de herencia mexicana?

Describa cómo aprendió el idioma español:

¿Con qué frecuencia utiliza actualmente el idioma español?

Edad:

Nivel de Educación:

  Alguna escuela secundaria
  Graduado de la escuela secundaria
  Alguna educación universitaria
  Graduado universitario
  Tener un grado superior
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