University of Southampton

Faculty of Arts and Humanities

Department of Modern Languages and Linguistics

Heritage Language Acquisition under Feature Reassembly:
The development of Spanish viewpoint aspect morphology by heritage speakers in the United Kingdom

by

James Anthony Corbet

ORCID ID 0000-0003-4660-9551

Thesis for the degree of Doctor of Philosophy

June 2021

University of Southampton

Abstract

Faculty of Arts and Humanities

Department of Modern Languages and Linguistics

Doctor of Philosophy

Heritage Language Acquisition under Feature Reassembly:

The development of Spanish viewpoint aspect morphology by heritage speakers in the United Kingdom

by

James Anthony Corbet

This thesis examines the suitability of the Feature Reassembly Hypothesis (Lardiere, 2009) as applied to heritage language acquisition by Putnam and Sánchez (2013) for understanding heritage speakers' grammatical knowledge using the specific case of the development of Spanish viewpoint aspect morphology by heritage speakers in the United Kingdom. Spanish heritage speakers in the United Kingdom have not been widely studied (Guardado, 2018), but heritage speakers present a unique challenge to generative theories of linguistics because the outcome of the first language acquisition process often results in grammars that diverge substantially from the input (Lohdnal *et al.*, 2019). Under a feature-based account, the continuous and habitual readings of the Imperfect would be expected to be more vulnerable for heritage speakers due to the cross-linguistic differences in expression of these meanings between English and Spanish, whereas the progressive reading of the Imperfect and the association between perfective and Preterite morphology would be less vulnerable (Arche, 2014; Domínguez, Arche & Myles, 2011, 2017). The specific research questions addressed in the thesis pertain to how viewpoint aspect is expressed in Spanish by both the heritage speakers and baseline speakers, how any observed divergence from the baseline manifests among the heritage speakers, and whether input quantity or language activation measures are better predictors of heritage speakers' grammatical outcomes. This thesis constitutes the first investigation of feature reassembly or viewpoint aspect in Spanish heritage speakers in the United Kingdom. It is also the first study to examine Arche's (2014) derivation of viewpoint aspectual interpretation in heritage speakers.

In order to answer these questions, the *Cat Story* narrative retelling task, and an adapted version of the semantic interpretation from the Spanish Learner Language Oral Corpus project (SPLLOC; Domínguez *et al.*, 2013) were deployed to assess the heritage and baseline speakers' use and knowledge of viewpoint aspect distinctions. Additionally, the heritage speakers' speech rates in Spanish and English were calculated using an additional narrative retelling task, the *Loch Ness* story, which was also used in the SPLLOC project (Mitchell *et al.*, 2008), and the heritage speakers' current and lifespan use of and exposure to English, Spanish and additional languages was calculated using Unsworth's (e.g. 2013) Bilingual Language Experience Calculator (BiLEC), yielding measures of input quantity, input quality, and language activation.

Twenty-five child heritage speakers of Spanish between the ages of five and fifteen participated in the project, as did sixteen of their parents. The baseline varieties of the parents

are Colombian Spanish, Mexican Spanish, two distinct varieties of Argentinian Spanish, and various regional varieties of Peninsular Spanish. The Peninsular varieties include speakers from the Communities of Andalucía, Madrid and Valencia, but crucially none from Galicia or the Canary Islands. The participants' usage rates of all verb forms in the narrative retelling task, accuracy rates in the semantic interpretation task, speech rate, and BiLEC measures were analysed using non-parametric Wilcoxon rank sum and signed rank tests, as well as Spearman's rank correlations.

The results show that whilst individual heritage speakers converge on the baseline grammar, a number of heritage speakers do not and that as a group the heritage speakers often differ from the baseline in specific ways. One of the main divergences observed was the use of the Present in lieu of the Imperfect in habitual and continuous contexts, which was associated with Spanish speech rate and relative output in Spanish, two measures of access to Spanish. Since these contexts are the ones in which greater vulnerability is expected under feature reassembly, and this association is predicted under Putnam and Sánchez's model, this manifestation of divergence provides substantial support for their model. However, another way in which the heritage speakers diverged from the baseline was observed for heritage speakers for whom the baseline variety allows the extension of the Present Perfect to express a restricted sub-set of perfective meaning. Several of these individuals used the Present Perfect to express perfective meaning in the *Cat Story* task, whereas the baseline speakers consistently used the Preterite for these contexts. The source of this divergence was internal to the properties of the Spanish baseline, therefore this divergence is not a result of feature reassembly but pertains to earlier in the acquisition process. Even so, the use of the Present Perfect or Preterite within this group of heritage speakers was strongly associated with the language access measures. An implication of this finding is that Putnam and Sánchez's model can be extended from only explaining divergence from the baseline grammar as a result of feature reassembly, to explaining divergence that obtains in the initial stages of feature selection and feature assembly as well.

Table of Contents

List of Tables

List of Tables

List of Figures

List of Figures

Research Thesis: Declaration of Authorship

Print name: JAMES ANTHONY CORBET

Title of thesis: Heritage Language Acquisition under Feature Reassembly: The development of Spanish viewpoint aspect morphology by heritage speakers in the United Kingdom

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. Parts of this work have been published as:-

Corbet, J. and L. Domínguez. 2020. The Comprehension of Tense-Aspect Morphology by Spanish Heritage Speakers in the United Kingdom. *Languages* 5(4), 20pp. doi: 10.3390/languages5040046.

Signature: ..... Date: 11/06/2021

Acknowledgements

As with any set of acknowledgements, I must acknowledge at the outset that far too many people have been involved in my journey to possibly do them justice here. My love for language was first inspired by a visit to 'Grandad in Spain' in the year 2000 when I was introduced to a slice of Britain on the costa blanca, and more interestingly to a language and culture in the background that I had had no conception of existing beforehand. This love grew and was nurtured in many ways by many people, without whom I would not have been able to write this thesis.

Of course, I literally would not exist without my family, but my gratitude and affection runs deeper than I would ever directly admit to them for much more than mere existence. It is nearly impossible to get a word in in a family of seven, especially when your twin sister started speaking on your behalf before she could properly speak herself: I have learnt how to listen, and that is a foundational quality of a linguist. I have also been privileged to be supported by many close friends at Christ Church Southampton as I have carried out this research, and I am especially grateful to Thomas for sharing his home with me for most of my PhD journey.

Since arriving at Southampton University, every single language tutor in French and Spanish challenged me and helped me to achieve the best, and this thesis is a testament to their dedication and care. I am especially grateful to the teaching and friendship of Paty Romero de Mills, Irina Nelson, Esteban Devis, Adrian Sewell and Laura-May Leaf. Irina also graciously provided her voice for the recordings of the instructions, contexts, and test sentences for the semantic interpretation task, for which I am immensely grateful. My friends Evee and Peter also created wonderful artwork for use with this task, and I am very thankful for their contribution.

I am immensely grateful to the support of the ESRC South Coast DTP. The funding allowed me to conduct this study, and the partnership gave me the opportunity to meet researchers across disciplinary lines, as well as have access to training that would have been hard to come by otherwise. I am especially thankful for Glenn and Gemma for answering so many emails.

I have been privileged to call many fellow graduate students from the Faculty and Department good friends, but it has been wonderful to have been part of the linguistics research community at Southampton, and to learn so much from so many wonderful research and teaching staff in the past decade or so. It has been a special joy to be in a research group alongside other PhD students and postdoctoral fellows in formal linguistics and language acquisition. Amber, James, Lewis, Fangyu, Ania, Eleonora, Eloi, and E: you are wonderful. It is also a privilege to have been part of 'Team Domínguez' alongside my academic sisters, Amy and Kefan.

Acknowledgements

I am grateful to Sarah Rule, Glyn Hicks, Sophie Holmes-Elliott, Ying Zheng, Alison Porter, Roumyana Slabakova and Jaine Beswick for being excellent teachers at every stage of my academic journey, and especially for providing much needed and helpful feedback on various topics at various stages of my research. Jaine has been a wonderful secondary supervisor, willing to provide support whenever necessary.

I am immensely indebted to Glyn Hicks and Alejandro Cuza for being thoroughly challenging and thoroughly kind examiners during my viva voce examination, and for providing detailed and immensely helpful feedback to improve the thesis.

Last but not least, the foremost acknowledgement is reserved for my tirelessly focused, supportive, and generally wonderful supervisor Laura Domínguez. Quite how you managed to be patient with me at my worst I will never know. But I do know that you have taught me immeasurably more than I could adequately say. Thank you for every single one of the many kindnesses you have shown to me and our wider research group.

I end in the style of J.S. Bach, appending these small, but mighty, letters to the text: **S.D.G.**

Chapter 1 Introduction

1.1 Purpose of the dissertation

This dissertation examines the adequacy of the current primary model of heritage language acquisition within Chomsky's (e.g. 1995) Minimalist Program of generative linguistic research, namely Putnam and Sánchez's (2013) model of Revised Feature Reassembly. Putnam and Sánchez's model is based upon Lardiere's (e.g. 2008, 2009) Feature Reassembly Hypothesis. In line with the Minimalist conception of features that are selected and assembled in different ways cross-linguistically, Lardiere argues that the primary locus of difficulty for 'late' bilinguals in acquiring a second language (L2) grammar consists in reassembling linguistic information that is encoded in different ways between the first language (L1) and L2. In their revision of this hypothesis to model heritage speakers, Putnam and Sánchez (2013) assume that the initial processes of language acquisition successfully take place for both languages, and that subsequent dominance of the majority language leads to restructuring of the heritage grammar towards the majority language.

Heritage speakers are a subset of early bilinguals (Polinsky, 2018a) who, having grown up in an environment that is heavily dominant in one of their languages (Valdés, 2000a; Rothman, 2009), exhibit a wide range of grammatical outcomes (Silva-Corvalán, 1994; Polinsky, 1997). This heterogeneity within populations of heritage speakers has led to a number of accounts being given for why they grammatically differ from other native speakers of a language. The most prominent suggestions in the field are that these different grammatical outcomes result from reduced input (e.g. Montrul, 2002, 2008; Silva-Corvalán, 2003, 2018), less variation in the types of input (e.g. Pires & Rothman, 2009; Kupisch & Rothman, 2018), and processing-related constraints (e.g. Scontras, Polinsky & Fuchs, 2018; Putnam, Perez-Cortes & Sánchez, 2019).

To date, the majority of research on heritage language acquisition, including that investigating Putnam and Sánchez's (2013) Revised Feature Reassembly model, has largely consisted of observations of adult heritage speakers and using these to infer the processes that led to the observed outcomes. Whilst notable exceptions exist (e.g. Cuza *et al*., 2013; Cuza & Miller, 2015; Cuza & Pérez-Tattam, 2016 ; Fernández-Dobao & Herschensohn, 2020; Silva-Corvalán, 2003, 2014), the paucity of research with child heritage speakers leads Montrul (2018a) to describe this source of data as a missing link for the field, without which we cannot properly understand the processes that lead to the observed outcomes.

Viewpoint aspect, often referred to as grammatical aspect, is a semantic universal that differs in its grammatical expression cross-linguistically (Comrie, 1976), and which is known to be a vulnerable feature of heritage speakers' grammars generally (Montrul, 2016; Polinsky, 2018a). In general, viewpoint aspect is understood as relating to the "different ways of viewing the internal temporal consistency of a situation" (Comrie, 1976: 3). Sociolinguistic descriptions (e.g. Silva-Corvalán 1994), experimental studies on adult heritage speakers of Spanish (e.g. Montrul, 2002; 2009), and studies with childhood bilinguals in the United States (e.g. Silva-Corvalán, 2003; 2014) have shown that aspectual morphology is an area in which these groups of bilinguals differ from their monolingual peers. Separately, studies of second language (L2) acquisition of Spanish aspectual morphology by first language (L1) English speakers have shown that whilst English speakers are capable of acquiring the Spanish verb forms and can reliably distinguish the morphemes in certain contexts, they still have residual difficulties at advanced levels, especially for specific form-meaning mappings (e.g. Domínguez, Arche & Myles, 2011; 2017). As such, the acquisition of viewpoint aspect morphology by heritage speakers constitutes an ideal area to test hypotheses about heritage language acquisition, and specifically to evaluate the suitability of and the predictions generated by Putnam and Sánchez's (2013) Revised Feature Reassembly model.

After providing the research questions I address, the remainder of this introduction provides a conceptual background for the study of heritage language acquisition. I begin with a review of 'bilingualism', which is followed by a discussion of the definition of 'heritage speakers' and an initial elucidation of some of the principal explanatory factors in heritage language acquisition. Finally, I present the structure of the remainder of the dissertation.

1.2 Research questions

I address the following research questions in this thesis in order to assess Putnam and Sánchez's (2013) model of Revised Feature Reassembly:

1. How are the features associated with viewpoint aspect assembled in the Spanish grammars of baseline speakers and heritage speakers in the United Kingdom?
2. In the case that the heritage speakers' assembly of viewpoint aspectual features diverges from the baseline grammar, how is this divergence manifested?
3. What is the role of the input and language access in the acquisition of viewpoint aspect in the heritage speakers' grammars? Specifically, to what extent are measures of language access better at predicting heritage speakers' accuracy than measures of language input?

1.3 Bilingualism in theory and reality

Montrul (2008, 2013, 2015) defines bilingualism as "knowledge of two languages, although not necessarily to the same degree" (2015:15). When considering all people who report linguistic skills in at least two languages, Grosjean (2010: 13) estimates half of the world's population to be bilingual. Whilst this is a useful starting point, it hides a large amount of variation in the different types of bilingual that exist. Here, and throughout, I follow convention and refer to the age of children using the format 'Y;M', where *Y* represents the age in years and *M* represents the age in months. As such, the age of a child at 1 year and 4 months after birth would be rendered as 1;4.[1]

Language acquisition researchers make a principled distinction between early bilinguals and late bilinguals (Meisel, 2011; Montrul, 2008). Following Lenneberg (1967), a 'critical period' of language acquisition has often been evoked to distinguish between adult and child second language learners, although there is unclear evidence whether such a period does in fact exist. A further distinction can be made between early bilinguals who are exposed to two languages from birth—simultaneous bilinguals—and those for whom exposure to one of the two languages was delayed, although still appearing comparatively early compared to child second language learners–sequential bilinguals.

Meisel (2011: 222-223), for instance, points out that studies of grammatical outcomes suggest that the period between an age of exposure of three years six months (3;6) and 4;0 marks the edge between early bilingualism and child L2 acquisition. Schmid and Karayayla (2020) use advanced statistical methods to suggest that a meaningful difference in grammatical outcomes in a bilingual context emerges around age 10, although their data shows variability increasing from age 5; more direct research on maturational constraints indicates that an age of acquisition after 7;11 separates child L2 and adult L2 acquisition (Hyltenstam & Abrahamsson, 2003). Schulz and Grimm (2019) argue that the cut off between simultaneous and successive bilinguals is at approximately 2;0. Studies on simultaneous bilingual children at young ages have demonstrated that they can successfully acquire the two grammars available in their environment. For example, Paradis and Genesee (1996) tested French-English bilingual children between the ages of 2 and 3 years old, and found that for the aspects of French and English that they tested, the children progressed at similar rates to monolingual children (Paradis & Genesee, 1996: 20).

Studies into the linguistic characteristics of bilingual communities in the late 20th century (e.g. Silva-Corvalán, 1994; Polinsky, 1997) made an unexpected observation given children's early

[1] There are additional conventions for referring to days, but these are not relevant to the current research.

success with bilingualism: these children became a community of adults with significantly different grammars from the input that they had heard in this language as children. These adults are known as heritage speakers of their L1, and their existence challenges many generative assumptions about language acquisition (Pascual y Cabo, 2015; Lohndal et al., 2019; Polinsky & Scontras, 2020), challenging the claim that "one will never find native speakers who acquired incomplete knowledge of their language" (Meisel, 2011: 13).

1.4 Defining Heritage Speakers

As hinted at in the previous section, heritage bilingualism is a highly complex phenomenon, and it is therefore difficult to arrive at a precise definition of a heritage speaker (Montrul, 2016: 16). One of the confounding factors is that proficiency in the heritage language exists along a continuum (Montrul, 2016: 16-17; Polinsky, 2018a: 5-6)[2]. Consequently, much research on heritage speaker grammars has focused on the fact that their grammars are seen to diverge both from the grammatical variety they would ordinarily be expected to acquire and from the outcomes observed in other heritage speakers.

Some researchers have begun moving towards equating early bilinguals with heritage speakers regardless of further factors (e.g. Kupisch, 2013, 2019; Montrul, 2016). Kupisch (2013, 2019) more generally raises the importance of linking research on early bilingual populations with research on heritage speakers explicitly described as such, which has led to fruitful dialogue between the two research areas (e.g. Aalberse & Hulk, 2018 and papers therein). Montrul, however, is more ambitious, expanding the definition of heritage speaker from an earlier focus on highly specific sociolinguistic contexts (2008: 20) to include almost all types of bilinguals outside of contexts of balanced diglossia (2016: 14-15). A more balanced position is taken by Polinsky (2018a), who provides a helpful initial clarification on the nature of heritage speakers: they "are a subtype of simultaneous or sequential bilinguals" (p. 17). Whilst this is a necessary distinction, the more fundamental questions of how to define heritage speakers and how to explain their linguistic outcomes remain a source of controversy and debate within the field.

Focusing on the definition of heritage speakers first, the literature that has developed since their identification as a linguistically interesting population has typically adopted one of two definitions. The first was originally taken from a teaching handbook with a very specific audience

[2] Silva-Corvalán (e.g. 1991) was the first to describe a bilingual continuum in the context of heritage speakers.

in view, whereas the second, more recent, definition is an attempt at a broader definition. The first definition is from Valdés (2000a):

> A student who is raised in a home where a non-English language is spoken, who speaks or merely understands the heritage language, and who is to some degree bilingual in English and the heritage language.
>
> **Valdés, 2000a: 1**

Lynch (2008: 276) argues that Valdés overly emphasises the restriction of the heritage language to the home environment, noting that both Carreira (2004) and Beaudrie and Ducar (2005) have similar reservations to this over-simplified description of the context for heritage language acquisition. Conversely, Montrul (2016: 16) emphasises that, in spite of Valdés' focus on English in the US context, her definition provides "sufficient operational criteria to characterize linguistic knowledge properly" in heritage speakers generally. In particular, this relates to the 'degree' of bilingualism, which is an important factor for a highly heterogeneous population. Where Valdés' definition is "sufficient", Rothman's (2009) considers all possible factors that may differentiate heritage language acquisition from other instances of L1 acquisition:

> A language qualifies as a heritage language if it is a language spoken at home or otherwise readily available to young children, and crucially this language is not a dominant language of the larger (national) society. Like the acquisition of a primary language in monolingual situations and the acquisition of two or more languages in situations of societal bilingualism/multilingualism, the heritage language is acquired on the basis of an interaction with naturalistic input and whatever in-born linguistic mechanisms are at play in any instance of child language acquisition. Differently, however, there is the possibility that quantitative and qualitative differences in heritage language input and the introduction, influence of the societal majority language, and differences in literacy and formal education can result in what on the surface seems to be arrested development of the heritage language or attrition in adult bilingual knowledge.
>
> From a purely linguistic point of view, we assume that an individual qualifies as a heritage speaker if and only if he or she has some command of the heritage language acquired naturalistically (e.g. Valdés, 1995, 2000a), although it is equally expected that such competence will differ from that of native monolinguals of comparable age.
>
> **Rothman, 2009: 156**

As can be seen in this extended quotation, Rothman's specific comments on the linguistic nature of the heritage bilingual's grammar draws upon Valdés' earlier definition. In addition to many other researchers in the field, Polinsky (2016a: 2) sees Rothman's definition as useful because of its focus on the role of language dominance without claiming the heritage speaker is any of the specific types of bilingual mentioned in the previous section, which she suggests provides a suitable description of the bilingual continuum observed in heritage speakers.

Furthermore, the focus on 'quantitative' and 'qualitative' differences in heritage language acquisition provides a role for sociolinguistic variation in the input received by the heritage speaker, in addition to the psycholinguistic factors that can affect acquisition. Kupisch and Rothman (2018: 567) also maintain that another positive element of this definition is its lack of a particular pathway from early bilingual balance to a bilingualism in which the social majority language is dominant, although Valdés' (2000a) definition also lacks such an explicit pathway, focusing instead on the outcome grammars. It is, however, worth noting that Rothman's definition does provide a closed list of factors that may lead to differences in outcomes between monolingual and heritage language acquisition, and that more recent research has pointed to additional factors, such as processing-related constraints having a substantial role in explaining parts of this difference as well (see Polinsky & Scontras, 2020: 13-14).

A third definition is provided by Benmamoun, Montrul and Polinsky (2013: 133). Whilst it is not as widely cited as the Valdés or Rothman definitions, it does incorporate many of the defining characteristics of the other two definitions:

> A heritage speaker is an early bilingual who grew up hearing (and speaking) the heritage language (L1) and the majority language (L2) either simultaneously or sequentially in early childhood (that is, roughly up to age 5; see Schwartz 2004, Unsworth 2005), but for whom L2 became the primary language at some point during childhood (at, around, or after the onset of schooling). As a result of language shift, by early adulthood a heritage speaker can be strongly dominant in the majority language, while the heritage language will now be the weaker language.
>
> **Benmamoun, Montrul & Polinsky, 2013: 133**

This definition removes the overt focus on English found in Valdés (2000a), instead proffering a reference to sociolinguistic dominance in line with Rothman (2009). The 'can' in the final sentence also maintains the commitment to viewing heritage speakers as existing on a continuum of proficiencies and outcomes. Additionally, the introduction of 'language shift' provides an account for why early balance (e.g. Paradis & Genesee, 1996) may be followed by divergence in the

minority language, although this definition is still uncommitted as to what this divergence will look like, or how it will arise following the unbalancing of the bilingual dyad.

As Kupisch and Rothman (2018) highlight the benefit of not asserting a specific pathway by which heritage speakers arrive at an outcome grammar, it is appropriate to reflect on the helpfulness of overtly considering language shift in the definition of heritage speakers as Benmamoun, Montrul and Polinsky do. Certainly, there is evidence that even the onset of pre-schooling (Silva-Corvalán, 2014, 2018) can coincide with early bilinguals (partially) rejecting a home language. But given the vast array of differences in the initial language experience of heritage speakers and the fact that their grammatical outcomes fall along a continuum, it is difficult to discern whether Benmamoun, Montrul and Polinsky's hypothesised 'language shift' can in fact take into account the variation observed in the field. For instance, the children studied by Silva-Corvalán (2014) were already predominantly using and hearing English when they began pre-school in an almost exclusively English environment; their language dominance became more overtly English and their Spanish input quantity was reduced, but language shift typically connotes a change in dominance, not reinforcing of dominance. In other words, although there was a language shift in absolute terms for these children, the relative importance of this shift for these children is likely to be smaller than a similarly sized shift observed in children who were dominant in Spanish becoming balanced bilinguals, or balanced bilinguals becoming dominant in English. As such, Benmamoun, Montrul and Polinsky's (2013) appeal to language shift, while potentially useful, is not clearly applicable to all heritage speakers, and it is noticeable that both Montrul (2016, 2018) and Polinsky (2018a, 2018b) no longer place as much emphasis on language shift as their definition of heritage speakers did.

It is clear at this point that these three central definitions of 'heritage speakers' make different emphases and provide different levels of detail. However, the definitions agree on two foundational principles that underpin the distinction between heritage speakers and other early bilinguals: the sociolinguistic context in which the language is acquired and the expectation that their linguistic competence will vary from other native speakers of that language, especially those who grow up in a monolingual environment. Where Valdés (2000a) focused on adequately defining heritage speakers for specific educational purposes in the US context, the other definitions are more general in nature. Rothman (2009) provides a maximal definition of the characteristics that define heritage speakers, the heritage language acquisition context, and factors affecting this process, whereas Benmamoun, Montrul and Polinsky (2013) present a more minimal explanation but focus on specific factors in the heritage language acquisition experience that can explain differences between heritage speakers, emphasising the role of language shift.

Taking these definitions and their central insights together, I am now in a position to distil these into a new definition that draws upon all three:

(1) A heritage speaker is an early bilingual speaker of a language that they rarely use outside of very specific contexts, for whom various language-external factors can result in highly heterogeneous grammatical outcomes along a continuum, and whose outcomes in the socially dominant language will be more uniformly monolingual-like.

1.5 Explaining acquisition outcomes of Heritage Speakers

Turning to the second key question in heritage language research, how to explain the outcomes that obtain in this acquisition context, a large number of hypotheses and models of heritage language acquisition invoke sociolinguistic and psycholinguistic variables as having a key explanatory role in the grammatical outcomes observed in heritage speaker populations. Domínguez, Hicks and Slabakova (2019) provide a helpful summary of four major possible outcomes in heritage language acquisition that have been argued for in the literature:

1. Successful acquisition based on *monolingual-type* input […]
2. Successful acquisition based on *divergent* input […]
3. Attrition or reanalysis of previously acquired features […]
4. Incomplete acquisition of certain available features under limited input conditions […]

Domínguez, Hicks and Slabakova, 2019: 247-248; emphases original

The first of these two outcomes relate to the baseline grammar of the input that the children receive, whereas the latter two outcomes may be driven by a number of factors, including the 'limited input' mentioned alongside 'incomplete acquisition'. The notion of 'incomplete acquisition' has been widely criticised in recent years (e.g. Pascual y Cabo & Rothman, 2012; Putnam & Sánchez, 2013; Kupisch & Rothman, 2018; den Dikken, 2018), although its use is still advocated for by others in the field (Silva-Corvalán, 2018; Domínguez, Hicks & Slabakova, 2019), as discussed in Section 1.3.5. An alternative set of outcomes is given by Scontras, Fuchs and Polinsky (2015), who cite dominant language transfer, divergent attainment, and attrition as three possible outcomes of heritage language acquisition, with 'divergent attainment' effectively replacing the term 'incomplete acquisition'. In a more recent publication, Polinsky and Scontras (2020) repeat this list, although with a cautionary note about the difficulty of assessing the role of transfer (p. 5).

Polinsky and Scontras (2020: 13-14) consider two potential "triggers" of divergence in heritage speakers: the input and online processing limitations. In the case of the input, Polinsky and Scontras highlight input quantity, referring to the amount of exposure heritage speakers receive in the heritage language, and input quality, referring to the types of sources of input that heritage speakers receive. However, input quality has traditionally had a wider range of meaning; for example, Rothman (2009: 157) alludes to input in the family language being modified in quality, relating the notion to attrition in the baseline grammar. Given that there are myriad ways in which the bilingual acquisition context of heritage speakers qualitatively differs from other L1 acquisition contexts, it is difficult to clearly define or measure. In the case of online processing limitations, Polinsky and Scontras suggest that heritage speakers may restructure their grammar of the heritage language to alleviate the pressure of bilingualism in language processing. Resulting from these triggers, Polinsky and Scontras (2020: 14-15) suggest three strategies that tend to be observed in heritage speakers' grammars: avoiding ambiguity, reducing irregularity, and economising structural representation.

Polinsky and Scontras' separate discussion of acquisition outcomes, "triggers" of divergence and strategies that shape heritage speakers' grammars is somewhat helpful, although it is unclear where their notion of transfer best fits into this schema. Unlike divergent acquisition or attrition, which describe separate pathways by which the triggers may lead to the strategies shaping the ultimate acquisition outcome, the concept of dominant language transfer seems to be at once a strategy and an acquisition outcome. It may be more helpful to conceptualise language transfer as only operating at one of these two levels, specifically as an additional strategy that heritage speakers may resort to that manifests as a divergent acquisition pathway, or leads to the attrition of previously acquired knowledge. Consequently, I consider 'transfer' to be a factor that may explain heritage speakers' grammatical outcomes, but not as a specific outcome of heritage language acquisition.

As such, whilst Scontras, Fuchs and Polinsky (2015) and Polinsky and Scontras (2020) both provide helpful discussions of the factors that motivate different outcomes in heritage language acquisition, they do not add to the list of four outcomes proposed by Domínguez, Hicks and Slabakova (2019). There is also a fifth outcome, that of heritage speakers picking up and extending language change that is incipiently present in the input, as proposed by Silva-Corvalán (1994), which can be construed of as a special case of the second outcome in the list above. I briefly consider each of these in turn here.

1.5.1 Successful acquisition of a monolingual-type variety

Kupisch (2013, 2019) has linked the research on adult heritage speakers, typically conducted in the USA, with research on bilingual children, typically conducted in Europe, and queried how competing results from these two fields relate to each other. Where adult heritage speakers typically exhibit divergence from the baseline grammar, studies of child bilinguals often show high degrees of convergence with the baseline grammar, although this may be a reflection of the socio-economic status of the bilinguals and the relative prestige attached to bilingualism in the two contexts (e.g. Kupisch, 2019: 459; see also Kupisch & Rothman, 2018). Meisel (2014) also notes the disparity in convergence and divergence between the fields, and speculates that the role of reduced input may explain this discrepancy, with those studied as children typically receiving more input during the years they were studied than the adult heritage speakers would have done. Some evidence for this comes from Silva-Corvalán's (2003) exploration of the consequences of reduced input on the development of Spanish verbal morphology, with children from more balanced or Spanish-dominant environments having more target-like verbal systems than their counterparts from more English-dominant environments.

1.5.2 Successful acquisition of a contact-type variety

Studies by Rothman (2007) and Pires and Rothman (2009) show that whilst heritage speakers of Brazilian Portuguese did not exhibit monolingual-like competence of inflected infinitives, heritage speakers of European Portuguese did. If amount of exposure was the only relevant factor, this would be an unexpected result. Instead, it transpires that this variation in outcome reflects a sociolinguistic difference between colloquial varieties of European and Brazilian Portuguese, and therefore in the baseline grammar that the heritage speakers acquired. Inflected infinitives are part of the spoken vernacular in Portugal, but not in Brazil where they are only preserved in the formal standard-educated variety. This demonstrates that heritage speaker children can successfully acquire the grammar of the input they receive, but that sociolinguistic variation already present in the baseline can fully explain perceived divergences from L1 norms in heritage speaker populations.

This position is known as the Missing Input Divergence Hypothesis, because the essential claim of this position is that the acquisition of the heritage language grammar is complete with respect to the input provided, which itself diverges from the expected norms of the L1 community. In principle, the 'divergence' observed in heritage speakers can be explained in two ways: either the difference is a known and expected result of sociolinguistic variation in monolingual communities (as Pires & Rothman, 2009), and as such is best understood as successful acquisition of L1 norms.

Conversely, heritage speaker divergence can be the result of language contact in the parental generation leading to grammatical attrition and the establishment of a contact variety that will then be acquired by the children.

1.5.3 Extension of incipient changes in a contact variety

Whilst all of the bilinguals in her study exhibited a variety of innovative grammatical behaviours, Silva-Corvalán (1994: 205) observed that different groups of bilinguals did so to different extents. In short, where small changes affected very specific linguistic properties in the first generation, by the third generation grammatical changes were more pronounced and affected more parts of the language system (Silva-Corvalán, 1994: 210-211). That is to say, incipient changes in the baseline grammar were being accepted and extended by the heritage speaker generation.

In effect, this draws a parallel from the changes observed in heritage speaker grammars with the typical process of diachronic change. In situations of language change in a monolingual community, it has been widely argued that diachronic change can be construed as children diverging from the input they receive (e.g. Lightfoot, 2010). Whilst this is a highly interesting theoretical proposal, it is clear that there is only a monolingual-type parallel for some of the changes observed in Los Angeles Spanish by Silva-Corvalán (1994). For example, whilst copula use may be changing in parts of the Spanish-speaking world, the Preterite-Imperfect distinction is not undergoing change. Consequently, it is unclear how this could be construed as an expected innovation in child language apart from through contact with English.

1.5.4 Attrition or reanalysis of previously acquired features

Although this position was one of the first advanced in the field, and an early association was made between attrition in adults and non-target-like acquisition in children (Polinsky, 1997), the potential role of attrition was largely overlooked in most early work on heritage speakers. In a sense, it is empirically hard to separate incomplete acquisition and attrition, as this requires the testing of child and adult heritage speakers, or a longitudinal study of one such group of speakers over a substantial period. Most studies conducted into heritage speakers have only compared a baseline and adult heritage grammar, and as such have not been able to differentiate incomplete acquisition and child first language attrition, much like Montrul (2002).

The claim that grammatical attrition may be taking place during childhood is a conceptually challenging notion. L1 grammatical attrition pre-supposes that a typically developed L1 grammar comes under influence the influence of an L2 after a long period of immersion in the L2 environment (see Domínguez, 2013; Domínguez & Hicks, 2020; Iverson, 2012). Whilst “every

bilingual is an attriter" (Schmid & Köpke, 2017: 641) in the sense that they exhibit processing and other differences from monolingual speakers of a given language, grammatical attrition is a comparatively under-exemplified phenomenon. That is to say, observed changes to the L1 grammar arise only after the grammar has reached a target-like end-state, and then been influenced by prolonged exposure to another linguistic system following this. In the case of heritage speakers, the term 'attrition' must therefore refer to a somewhat different phenomenon with respect to the grammar, as they are still acquiring the heritage language when this reanalysis takes place. Whilst some linguistic knowledge may have been acquired, and subsequently lost during childhood, the heritage speaker cannot be assumed to have stabilised at an end-state grammar that later comes under the influence of another linguistic system.

Polinsky (2011) has clearly demonstrated that where Russian-English child bilinguals had knowledge of Russian object relative clauses, matched adult bilinguals did not. This difference provides direct evidence that some features are initially acquired and subsequently attrited, and that access to the right data can tease apart these two proposed constructs. This line of enquiry is further elaborated in contributions by Scontras, Fuchs and Polinsky (2015) and Polinsky (2018b).

1.5.5 Incomplete acquisition or divergent attainment of certain features

Owing to its early proposal, 'incomplete acquisition' became relatively synonymous with the concept of a 'heritage speaker' (e.g. Polinsky, 2006; Montrul, 2008), although it is clear from Montrul (2002) that the notion describes a small subset of heritage speaker grammars as against those which have undergone attrition or where the input grammar is different from expected monolingual norms. In its more precise definition (e.g. Montrul, 2005), the assumption is that heritage speakers have received monolingual-type input, but that this has been at an insufficient level to acquire all linguistic features in the heritage language. As such, the resultant grammar is incomplete with respect to the assumed baseline for acquisition.

Both Silva-Corvalán (2003, 2014, 2018) and Montrul (2002, 2008, 2016, 2018a) have argued that the catalyst for incomplete acquisition is reduced exposure to the heritage language, especially compared to the majority language, during childhood. Input quantity is widely considered to be an important factor in research into bilingual language acquisition generally (Domínguez, 2009).

Montrul (2018a) advances the onset of schooling, which usually takes place in the socially dominant language, as the precipitator of this individual-level language shift to the dominant language at the expense of further development in the heritage language. Certainly, access to substantial education in the heritage language can facilitate heritage language maintenance and development (Kupisch & Rothman, 2018), and the areas 'missing' in heritage speaker grammars

often pertain to more literary and educated varieties of the language (e.g. Pires & Rothman, 2009). However, Montrul's position does not take account of day-care or pre-school provision, which will often also be in the majority language; Silva-Corvalán (2014) reports that her bilingual grandchildren's shift to English precedes the onset of schooling, although this onset does further entrench the dominance of English.

More recently, a number of researchers on heritage language acquisition have taken exception with the characterisation of heritage grammars as 'incomplete' (Pascual y Cabo & Rothman, 2012; Putnam & Sánchez, 2013; Scontras, Fuchs & Polinsky, 2015; Kupisch, Bayram & Rothman, 2017; Kupisch & Rothman, 2018, Polinsky, 2018a). To summarise a general strain of argument found in this group of papers, describing a grammar as 'incomplete' can make it sound as though scientific study of the phenomenon of heritage language acquisition is making an evaluative judgment on heritage speakers themselves (Kupisch & Rothman, 2018: 578-579). Furthermore, it is also argued that 'incomplete' is an inaccurate description of heritage speaker grammars, since they are grammatically complete and incompleteness is only relative to the baseline grammar (Polinsky, 2018a: 25). Polinsky (2018a) and colleagues (Scontras, Fuchs & Polinsky, 2015) use the term 'divergent attainment' to describe situations that had previously been referred to as incomplete, whilst Montrul (2016) advances the concept of 'acquisition without mastery'.

In effect, these two terms differ in their connotative meaning, and both differ from the initial proposal of 'incomplete acquisition'. For a start, 'divergence' only implies difference, and allows for a greater variety of outcomes and pathways to these outcomes than the earlier 'incomplete' label (Domínguez, Hicks & Slabakova, 2019). On the other hand, 'acquisition without mastery' suggests that variance observed in heritage speaker production and comprehension could reflect an under-constrained grammar, whereas the evidence points to heritage speaker variation being highly constrained, just not along the same lines as the baseline grammar (Polinsky, 2018a).

Domínguez, Hicks and Slabakova (2019) argue that 'incomplete acquisition' is a theoretically justifiable and important term for distinguishing grammatical outcomes in heritage speaker populations. Whilst noting that some of the connotations are unfortunate, they highlight that incompleteness is a widely used term in other areas of language acquisition research, and that since 'incomplete' is a more precise description of some of the differences observed in heritage speaker grammars, it is scientifically valid to use the phrase in appropriate contexts. Silva-Corvalán (2018) also makes this point in her comparison of different datasets; some of the outcomes observed in her grandchildren's Spanish grammars can only be accounted for under a model of incomplete acquisition.

1.6 The structure of the dissertation

The remainder of this dissertation is structured as follows. In the next chapter, I review the previous literature on the acquisition of viewpoint aspect by Spanish heritage speakers. Naturally, this involves a primary focus on such speakers in the USA.

In Chapter 3, I contextualise Putnam and Sánchez's (2013) model of Revised Feature Reassembly within the Minimalist Program of generative linguistic research, and show how this theory has been and can be applied to heritage language acquisition and the study of the grammar of heritage speakers. I initially focus on the theoretical foundations of the Minimalist Program, and then processes relating to the acquisition of features in L1 acquisition, L2 acquisition, and L1 attrition. These insights undergird the discussion of Putnam and Sánchez's (2013) Revised Feature Reassembly model.

Chapter 4 describes viewpoint aspect, the linguistic variable under investigation in this dissertation, and current generative approaches to its construction. I begin with a pre-theoretical description of tense-aspect morphology in Spanish and English, which forms the basis of the following discussion of the theoretical accounts under review. I especially elaborate upon Arche's (2014) predicate ordering approach to viewpoint aspect, and highlight the clear testable predictions for acquisition that arise from combining this predicate ordering approach and Putnam and Sánchez's (2013) model of Revised Feature Reassembly.

In the fifth chapter, I detail the design of the present experimental study, conducted to evaluate the Revised Feature Reassembly model put forth by Putnam and Sánchez (2013). In view of the previous research and theoretical considerations laid out in the previous chapters, I begin by recapitulating the research questions addressed by the study. I then present a summary of the acquisition task and predictions arising from the theory, before describing the methodology adopted to answer these questions.

This is followed by the presentation of results from the study in Chapter 6. The section proceeds task by task, starting with descriptive data, followed by statistical analyses and comparisons. To provide an initial summary, I find stability in the Preterite-Imperfect contrast for the parental baseline speakers, and some of the heritage speakers have acquired the baseline system. However, there was a high degree of heterogeneity in the heritage speakers' data. Principally, this manifested as either use of the Present in habitual and continuous contexts in production, and marginally increased hesitancy to reject the Preterite in comprehension, or the use of Present Perfect instead of the Preterite to express perfective meaning. I find language access measures to be more predictive than input quantity measures, but less than age at time of testing.

In Chapter 7, I discuss how these results address the research questions and advance our theoretical understanding of feature-related processes in heritage language acquisition. In particular, I interpret the results as generally supporting the Revised Feature Reassembly model (Putnam and Sánchez, 2013), and that some manifestations of divergence from the baseline, such as use of the Present Perfect, suggest that this model can be extended to earlier in the acquisition process. I also discuss broader contextual issues and limitations of the study.

Chapter 2 Feature Reassembly and the heritage speaker

2.1 Introduction

In this chapter, I present the theoretical and acquisition framework in which this project is situated. Putnam and Sánchez's (2013) model of heritage language acquisition is grounded in current generative linguistic theory, both in terms of the nature of language, the object of study, and the processes involved in language acquisition and cross-linguistic influence. In the decades since Chomsky's (1959) seminal critique of Skinner's (1957) behaviourist account of language acquisition, Chomsky's conception of generative grammar has become one of the most widely used paradigms for linguistic research. Since its earlier instantiations (e.g. Chomsky, 1965), the exact theoretical proposal and research questions of the generative enterprise have developed into the current Minimalist Program of linguistic research (e.g. Chomsky, 1995).

The chapter is structured as follows. In Section 2.2 I will briefly relate some core generative assumptions, before providing a slightly fuller explication of language and language acquisition in the Minimalist Program (Chomsky, 1995), after contextualising it in light of the preceding Principles and Parameters framework (e.g. Chomsky, 1981), and how Chomsky (2005) sees this Minimalist account as satisfying what he considers to be the three factors of language design. Section 2.3 relates how the Minimalist processes of L1 acquisition (e.g. Chomsky, 2001) have been argued to proceed in L1 acquisition in view of the other assumptions of the Minimalist Program (e.g. Lidz & Gagliardi, 2015). I then consider how the Minimalist understanding of language and acquisition processes inform recent generative accounts of L2 acquisition in Section 2.4, especially focused on Lardiere's (e.g. 2009) Feature Reassembly Hypothesis, and a brief note addressing recent attempts to theoretically explain L1 attrition under the Minimalist framework (e.g. Hicks & Domínguez, 2020). In Section 2.5, with all of the above pieces in place I examine how the observed outcomes of heritage language acquisition can be described and explained in the terms of the Minimalist Program, and then fully explicate Putnam and Sánchez's (2013) model. The discussion of this model includes a summary of studies that have already found support for it, an analysis of some conceptual difficulties associated with transplanting a theory of (late) L2 acquisition to (early) heritage bilingualism, and an identification of specific claims made by Putnam and Sánchez that can be empirically tested and verified.

2.2 Language and language acquisition in the Minimalist Program

Freidin and Lasnik (2011: 4) highlight the extent to which the Minimalist Program, while in many respects a radical departure from previous research agendas within generative linguistics, stems from foundational insights of the original expression of the paradigm. Chomsky (1965) argued that a theory of language had to have both descriptive and explanatory adequacy, with this latter concept relating primarily to whether the theory would result in an acquirable grammar. In order to achieve this, Chomsky posits that the capacity for language and language acquisition is a species-specific genetic endowment in which our minds have a unique cognitive capacity, the Language Faculty, which consists of a computational system—syntax and syntactic rules—and a lexicon. As such, in this paradigm of research, the abstract internal cognitive knowledge of language (termed 'I-language') within the Language Faculty is the appropriate object of linguistic theory, rather than the external manifestations of this knowledge in languages ('E-language') (Gallego, 2011: 525). Freidin and Lasnik comment on the link between acquisition and the 'I-language' stored within the Language Faculty as follows:

> The form of I-languages is largely determined by the grammatical mechanisms available for constructing linguistic expressions and the general constraints on their operation and output. These mechanisms and constraints apply generally across I-languages and therefore belong to the general theory of I-language, what is called universal grammar and thought to characterize the initial state of the language faculty in all speakers.
>
> **Freidin and Lasnik, 2011: 1-2.**

This conception of Universal Grammar (UG) has been central to generative grammar since Chomsky (1965). In the 1980s, the 'Principles and Parameters' (henceforth P&P) conception of the nature of UG came to the fore (Chomsky, 1981, 1986). Where UG had essentially been conceptualised as "providing a format for rule systems and an evaluation metric" (Chomsky, 1986: 146) before, this updated framework instead posited that UG contained knowledge of both universal principles that apply for any language and parameters, which are where differences between languages occur, organised into a range of sub-systems.

2.2.1 Principles and Parameters

A classic example of a universal principle is given in Chomsky's (1981) Principle P, according to which "certain configurations… must have subjects" (p. 27), which is further expanded to include all clauses as the Extended Projection Principle (Lasnik, 2003), partial evidence for which is given by the existence of expletive subjects in languages like English (e.g. 'it rains'). Likewise, a classic example of a parameter is the Null Subject or *pro*-drop Parameter, in which languages either allow or disallow covert subjects to fulfil the requirement for a subject (Chomsky: 1981: 240). Crucially, allowing covert subjects or not is also argued to correspond to other grammatical properties, such as word order rigidity and the morphological 'richness' of the language, leading to a cluster effect where several properties of the grammar can be associated together under potentially one parametric 'switch'.

As such, UG in the P&P framework consists of a very rich set of information that the acquirer has access to about what the language they are exposed to must be like in certain respects, and all the possible ways in which it might be configured in other respects. This constrains the range of possible grammars the acquirer has to entertain, and makes certain evidence more informative for acquisition purposes. For example, children would not need to independently hypothesise the concept of a subject, because subjects are universal; meanwhile, a clause with a subject would be compatible with both a *pro*-drop and a non-*pro*-drop language, but a clause with a covert subject would only be compatible with a *pro*-drop language. The acquirer uses this rich information to determine which of the various grammar types they are acquiring when they are exposed to the necessary input, and evidence from any one part of a cluster can lead the acquirer to infer far more about the grammar given the small piece of the system that they have acquired.

However, the empirical evidence does not provide clear support for the P&P framework. Focusing on the assumed 'clustering' of grammatical properties associated with one parameter, Gallego (2011: 535-536) notes that if *pro*-drop languages are parametrically associated with 'rich' morphology, then the Null Subject Parameter cannot explain, for example, why Mandarin Chinese allows null subjects whilst Russian does not. Furthermore, while advances in research increased the descriptive adequacy of the framework as new and more specific parametric differences were uncovered, this increased required richness of UG to guide an acquirer substantially reduced the explanatory adequacy of this kind of approach (Gallego, 2011: 535). In a radical departure from the increasing richness of UG under P&P, Chomsky (e.g. 1995) advocated the Minimalist Program, under which the smallest possible explicit language knowledge and computational system within UG and the Language Faculty is assumed (Freidin & Lasnik, 2011: 3-4).

2.2.2 Features

Under the P&P framework, Borer (1984) had proposed that "interlanguage variation would be restricted to the idiosyncratic properties of lexical items" (p. 2), or in others words that parametric differences were all located in the lexicon, a position which Chomsky (e.g. 1991) later adopted and continues to inform cross-linguistic differences under the Minimalist Program. Borer's proposal has come to be known as the Borer-Chomsky conjecture, and is often defined as follows:

> All parameters of variation are attributable to differences in the features of particular items (e.g. the functional heads) in the lexicon.
>
> **Baker, 2008: 353.**

As can be seen in this quotation from Baker (2008), features, broadly defined as "a property that distinguishes some elements from others" (Adger & Svenonius, 2011: 31), are highly important in the Minimalist framework. Adger and Svenonius (2011) point out that features were borrowed from phonology to capture important aspects of syntax in earlier instantiations of generative grammar (i.e. Chomsky, 1965), but in Minimalist theory formal or syntactic features "are properties of syntactic atoms and hence are directly objects of the theory" (p. 28)[3]. Intuitive examples of features can be seen in the various differences between pronouns, as in the following English and Spanish examples.

(1) I, my; he, his; she, her [English]
(2) Yo, mi; él, su; ella, su [Spanish]

Intuitively, 'I' and 'my' denote the same individual, the speaker, but fulfil different roles associated with the surface difference in case marking; pre-theoretically, 'I' is used as a subject and receives nominative case, and 'my' is used to denote a specific relationship, such as ownership, between the speaker and another noun and receives genitive case. The same systematic difference exists between 'he' and 'his', 'she' and 'her', and the three sets of Spanish equivalents in (2) as well. An equally intuitive difference in grammatical person is noticed between 'I' and 'he': 'I' denotes the speaker, first person, whereas 'he' typically refers to some male outside the conversation, third person. 'He' and 'she' are both outside the conversation, but differ according to the gender of the referent, which is relevant for both the nominative and

[3] Phonological features and semantic features also exist in addition to the 'formal' or 'functional' features discussed here that are directly relevant to the computational component of the grammar (e.g. Chomsky, 1995).

genitive pronoun with the same referent. Cross-linguistic differences in features are visible by the fact that, whilst the Spanish and English pronouns listed above are otherwise highly similar, gender is not expressed on the genitive version of the third person pronouns, unlike in English.

As already alluded to, Adger (2003) and Adger and Svenonius (2011) use the metaphor of atoms to describe the role of features as being the basic distinguishable units that combine to produce grammatical molecules, to extend the metaphor. Liceras, Zobl and Goodluck (2008) similarly compare features in Minimalism to the DNA of language. For both metaphors, the crucial point is that these features are central to linguistic inquiry in Minimalism, as features are the objects that are manipulated by the computational system. Adopting the Minimalist framework therefore entails studying language acquisition as the acquisition of features (Travis, 2008: 23).

2.2.3 A brief interlude: the three factors of language design

Recall that the Minimalist Program was concerned with reducing the complexity and necessary 'richness' of UG. In this context, Chomsky (e.g. 2005) argues that there are three necessary factors in language design to achieve the descriptive and explanatory adequacy that should be associated with a theory of language.

The first factor is the Language Faculty genetic endowment outlined above. Unlike previous instantiations of generative grammar, such as P&P, in which this genetic endowment could be as large as necessary to inform the acquirer of everything they could possibly need to know, in the Minimalist Program the assumption is that the genetic endowment should only be as large as necessary. As Biberauer (2019) notes, there is substantial disagreement in the field as to what the necessary size of this endowment is. In the strongest version, the only contents of the computational system is the operation 'Merge' to recursively combine units (e.g. Hauser, Chomsky & Fitch, 2002). Conversely, several researchers in the 'cartographic' tradition (e.g. Rizzi & Cinque, 2016) continue to posit highly rich contents of UG. Chomsky's (2005) remaining two factors are experience, in other words the input, and other cognitive principles, including statistical learning mechanisms, that are not language specific.

The debates and questions regarding these three factors, principally the first and third factors, are largely incidental to the present study testing Putnam and Sánchez's (2013) model. However, these factors inform aspects of several of the recent models and approaches to language acquisition sketched in the following sections, and indeed are highly relevant to heritage language acquisition more broadly. As will be related in Section 2.6, studies have shown that ways in which heritage speakers vary compared to other native speakers of the language can be predicted on the basis of the characteristics of the input (e.g. Pires & Rothman, 2009; Montrul, 2014),

corresponding to factor 2; likewise, many claims relating to heritage speakers' divergence from the baseline input relate to whether the quantity of input was sufficient for learning (e.g. Silva-Corvalán, 2003; Montrul, 2008), corresponding to factor 3.

2.3 First language acquisition under Minimalism

2.3.1 The core processes

Under the Minimalist Program, UG-constrained L1 acquisition involves two processes: Feature Selection from the universal set and Feature Assembly into the appropriate lexical items of the language being acquired (Chomsky, 2000 et seq.). The following quotation describes these two processes:

> S_0 determines the set {F} of properties ('features') available for languages. Each L [language] makes a one-time selection of a subset [F] of {F} and a one-time assembly of elements of [F] as its lexicon LEX, which we can take to be a classical 'list of exceptions,' putting aside further issues.
>
> **(Chomsky, 2001: 4)**

Where Feature Selection involves the child detecting the features in the input they receive, Feature Assembly involves putting these features together into lexical items of the lexicon of the language. Thus, a child exposed to English will not select a grammatical gender feature where a Spanish- or Arabic-hearing child would, and a Spanish-speaking child would assemble gender onto certain morpho-phonological forms in the nominal domain whereas an Arabic-speaking child would assemble the same gender feature onto certain morpho-phonological forms in the nominal and verbal domains.

Hegarty (2005) has proposed that children build their grammars one feature at a time, which is to say that Feature Selection and Assembly are iterative processes that do not operate uniformly during the course of L1 acquisition. Lardiere (2009: 185) highlights that, in practice, this proposal "allows for the possibility of the child's projecting individual features, or non-adultlike combinations of features, as distinct functional categories that are quite different from those in the adult system". This account constitutes a principled explanation for why the acquisition of certain parts of the grammar is more protracted than for others, and why children use forms in unexpected ways.

Longa and Lorenzo (2008) noted that very few L1 acquisition studies had actually shifted away from the preceding P&P model and argue for the testing of Minimalist theory. Recently, Goodluck

and Kazanina (2020) have considered two concrete examples of child behaviour that are better accounted for under a Minimalist account than previous generative models, but still note that "other areas of language development have scarcely begun to be explored from a Minimalist perspective" (p. 7). Pearl (forthcoming) likewise advocates that a shift to understanding I-language in Minimalist terms may be a fruitful avenue for exploration in L1 acquisition research, nearly three decades since the advent of the shift from P&P.

2.3.2 Beyond the core processes

In line with the three factors of language design (Chomsky, 2005) discussed in Section 1.2.3, generative research in L1 acquisition has shifted from primarily characterising the linguistic knowledge of UG, factor 1, to now considering how the characteristics of the input, factor 2, and non-linguistic conditions and mechanisms that could explain why language and language acquisition look like they do, factor 3, interact with this knowledge. In this section, I will briefly outline four acquisition models that provide principled accounts of the role of these two factors in L1 acquisition.

Lightfoot (1999, 2006) advanced a model of L1 acquisition in which the input children receive triggers structural cues in a rich UG that then get incorporated into their I-language representations, similar to the assumptions of P&P. Westergaard (2008) advances two modifications to this model. First, she argues that monolithic cues are not sensitive enough to explain all of the linguistic and acquisition data, and as such she argues that micro-cues apply at more specific levels. To provide an example, Westergaard's evidence is based on the Verb-second (V2) rule of Germanic languages; whilst Lightfoot would argue that sufficient evidence leads the child to activate the V2 cue and use V2, Westergaard argues that evidence only leads the child to apply the micro-cue at the level of the clause-type for which the evidence applies. The second modification is that, in line with the more recent Minimalist assumptions, Westergaard argues that these micro-cues are not activated in UG by the input but come directly from the input itself, with the role of UG being to constrain the possible cues. As such, this micro-cues model is one proposal under which the Minimalist account and proposal of the three factors of language design has been deployed.

More recently, Biberauer (2019) has addressed how "in the absence of a rich UG for an appropriately articulated learning theory to link to the input acquirers receive, we clearly have to let Factors 2 and 3 work harder than was previously the case" (p. 52). Biberauer proposes that a general cognitive bias, Maximise Minimal Means (MMM), operates as both "(i) a generally applicable learning bias harnessed by the acquirer during acquisition, and a (ii) a principle of

structure building" (p. 49). For Biberauer, the consequences of MMM for language acquisition lead the acquirer to assume the minimal possible set of features to account for the input, and then to maximally assume that the feature applies as widely as possible (pp. 59-60).

At a time when the role of statistical learning from the input was still widely viewed as being incompatible with UG and the generative framework, Yang (e.g. 2002) proposed the 'variational learning model' of language acquisition in which the effects of the distributional properties of the input and the contribution of UG are taken together. Central to this variational model, Yang has developed the Tolerance and Sufficiency principles of statistical learning that can describe the threshold at which a regular pattern that is observable in the input can reasonably be assumed to be a grammatical rule (2018: 680-682). Evidence linking the distributional properties of the input to age of acquisition of specific parts of the grammar provides relatively strong support to this model (e.g. Yang, 2004: 454-455). Yang and Montrul (2017) have suggested that this model could extend to situations of L2 acquisition and heritage bilingualism, which appears to have some empirical support (Morales Reyes & Montrul, 2020; Fernández-Dobao & Herschensohn, 2021)

Lidz and Gagliardi (2015) propose a model that seeks to explain how the input, statistical inference, and UG work in tandem in L1 acquisition. Figure 1 provides a graphical representation of how these three components are nested within the broader context of L1 acquisition:

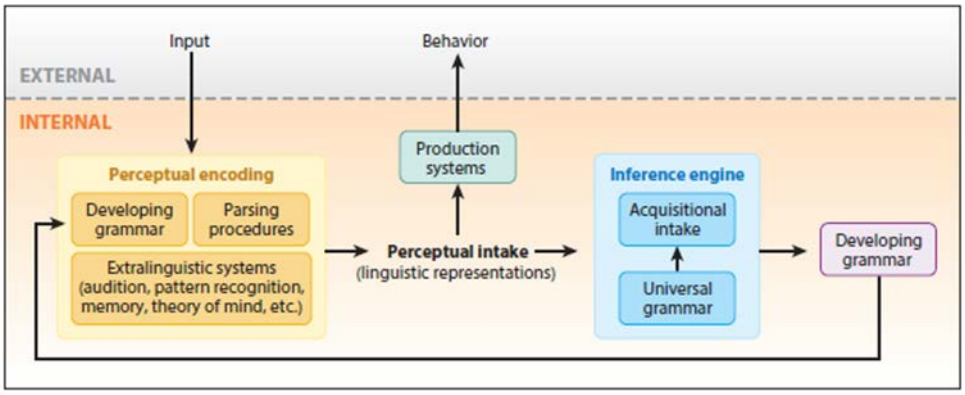


Figure 1: A graphical representation of Lidz and Gagliardi's model of L1 acquisition. Lidz and Gagliardi, 2015: 336.

Lidz and Gagliardi's (2015) model uses the notions of 'input' and 'intake', originally proposed in the field of L2 acquisition (Corder, 1967; Carroll, 2001), to distinguish the wider linguistic environment and the smaller amount of the input that is used by the child to acquire the language incrementally, until there is nothing left to select or assemble from the input. This model also incorporates each of Chomsky's (2005) stated three factors for language design: the genetic endowment (factor 1) is within the inference engine, and drives acquisition; the primary linguistic

data (factor 2) is the input; which is turned into intake by the general cognitive skills available to the child (factor 3) in the initial perceptual encoding.

> (a) The intake component identifies the features of the information to which learners are sensitive; (b) the UG component identifies the class of representations that shape the nature of human grammatical systems; and (c) the inference component identifies how learners combine the intake with UG in selecting a particular grammar.
>
> **Lidz & Gagliardi, 2015: 335**

The importance of the input-intake distinction in Lidz and Gagliardi's model is also fundamental to Putnam and Sánchez's (2013) model. In principle, each of the models briefly sketched in this section can be easily accommodated for 2L1 acquisition. Pearl (in press) provides an overview of additional statistical principles and considerations under 'UG + statistics' approaches to L1 acquisition. Although not necessarily directly relevant to the context of heritage language acquisition, these models and the three factor distinction show that there are many possible constraints on how input is used to generate an L1 grammar, which means that heritage speakers not converging on the baseline grammar is not necessarily as strong a challenge to generative assumptions within the Minimalist Program as for other research programs (Pascual y Cabo, 2015; Lohndal *et al*., 2019).

2.4 Second language acquisition under Minimalism

Whether or not the same knowledge and processes outlined within Chomsky's theory of UG are accessible for L2 acquisition was a prominent question in generative approaches to L2 acquisition through the 1990s and 2000s (White, 2003; see review in Rothman & Slabakova, 2018). A number of scholars posited a *representational deficit* in L2 acquisition (e.g. Hawkins & Chan, 1997; Hawkins & Liszka, 2003; Tsimpli & Dimitrakopoulou, 2007), under which the selection of features that are instantiated in the L2 but not in the L1 is impossible or extremely limited. Consequently, this approach explains the observation that L2 learners do not typically exhibit monolingual-type behaviour in their L2 by this representational deficit.

Schwartz and Sprouse's (1996) Full Transfer/Full Access (FT/FA) model of L2 acquisition represents the alternative position to the *representational deficit* account, under which it is claimed any part of the L2 grammar can be acquired because the L2er has the same complete access to UG as in L1 acquisition. Using minimalist terminology, under FT/FA the L2 learner initially transfers the features as selected and assembled in the L1 grammar as the initial state of the L2 grammar, but can subsequently reselect and reconfigure these over time into the correct configuration for the

L2. This development takes place through full access to UG as in L1 acquisition, in contrast to the representational deficit and similar generative approaches that argued for partial or no access to UG. The term 'full transfer' refers to the fact that the whole grammar of the L1 provides the initial shape of the L2 grammar. Rothman and Slabakova (2018: 423) present substantial evidence that L2 acquirers are capable of learning features not instantiated in their L1, contra the *representational deficit* account and corroborating the FT/FA model.

Within the framework of FT/FA, several hypotheses have been advanced to explain differences in performance by L2 learners, even though their representations may be in place. These include identifying factors outside the grammatical representation itself, such as the Missing Surface Inflection Hypothesis (e.g. Prévost & White, 2000), Prosodic Transfer Hypothesis (e.g. Goad & White, 2004) and the Interface Hypothesis (Sorace, 2011)[4] and the development of the grammatical system as the source of residual difficulty for L2 learners, such as the Bottleneck Hypothesis (e.g. Slabakova, 2008) and the Feature Reassembly Hypothesis (Lardiere, 2009). Of these suggested hypotheses, Lardiere's (2009) Feature Reassembly Hypothesis (FRH) constitutes a direct application of the minimalist conception of feature assembly to the context of L2 acquisition. Since the FRH forms the basis of Putnam and Sánchez's (2013) model of heritage language acquisition, I now turn to consider the FRH in detail, and in view of space limitations I do not discuss the other hypotheses further..

2.4.1 The mechanics of Feature Reassembly

In the FRH, Lardiere (2009) argues that the computational system and Feature Selection process are essentially unproblematic for L2 learners, with the assembly of relevant features from the L1 and newly selected features for the L2 into the relevant lexical items of the L2 lexicon presenting the major difficulty for L2 acquirers. Indeed, Lardiere (2009: 214) proposes that "any feature contrast that is detectable is, in principle, ultimately acquirable", with the added qualification that "it might not be acquired in any given particular case for independent reasons", in line with the group of grammar-external hypotheses mentioned above. Slabakova (2009) has suggested that the overtness of features in the L2 target grammar may make a feature contrast less detectable, and that this may make the Feature Reassembly process harder (see also Cho & Slabakova, 2014).

[4] I refer here to 'grammatical representation' in a narrow sense; Goad & White (2004) focus on how L1 phonology can limit online production, and Sorace (2011) focuses on interfaces between different grammatical domains. Both of these are part of the 'grammar' of a language, but are autonomous from the grammatical representations under discussion here.

In addition to the potential need for Feature Selection to take place where features in the L2 are not instantiated in the L1, Domínguez, Arche and Myles (2011) consider two scenarios under which Feature Reassembly may take place. In both cases, the same features are selected in the L1 and L2, but in the first scenario, the assembly of features into lexical items is the same in both languages and the learning task consists of mapping the associated features onto an appropriate language-specific form. Conversely, in the second scenario, features in the L1 are assembled into different lexical items in the L2, and the learning task requires the reassembly of features into the different lexical items.

An example of the first scenario might be plural marking in different European languages; whilst English generally uses an *-s* morpheme to indicate [+plural], in Italian [+plural] is mapped to a vowel change *-o* to *-i*, *-a* to *-e*, and *-e* to *-i*, and the learning task is essentially just mapping the same feature onto a new form. The second scenario would involve a case such as grammatical gender in Spanish and Arabic; In Spanish, gender agreement is morphologically marked only in the nominal domain, whereas gender agreement in Arabic is morphologically realised throughout the nominal and verbal domains, and there is therefore a more complex process of not only learning the appropriate forms, but assembling these forms onto substantially different lexical items. Domínguez, Arche and Myles (2011: 188) provide an illustration of the differences in feature selection and assembly between two grammars, and the associated difficulty or ease of acquisition of features in the L2 grammar. I provide a simplified version of that illustration in Figure 2.

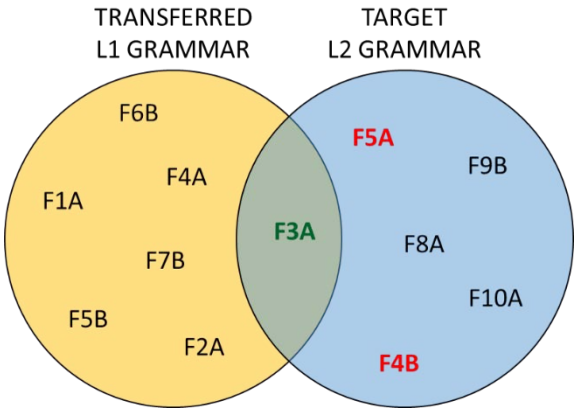


Figure 2: A simplified version of Domínguez, Arche and Myles' (2011: 188) illustration of feature-based differences between an L1 and an L2

In these simplified grammars, a number of features F1 to F10 are independently selected and assembled onto different lexical items in the grammars. In the case of feature F3, it is assembled in the same way, F3A, in both the L1 and the target L2 and so it is not expected to be difficult to associate with the appropriate lexical items in the L2, as in the case of Domínguez, Arche and

Myles' first scenario. However, features F4 and F5 are assembled in different lexical items in the L1 and L2, and as such these are expected to be more difficult to acquire, as in the second scenario. As for features F8, F9, and F10, which are only selected in the L2, Lardiere (2009) argues that these are acquirable if they are detected, but a formal explanation of their acquisition and whether this is a specific source of difficulty in L2A is outside the scope of the FRH (Domínguez, Arche & Myles, 2011: 194).

Since its initial proposal, a substantial program of research has investigated the FRH, and here I provide a very brief sketch of some studies that have found support for the hypothesis. Domínguez, Arche and Myles (2011, 2017) find that the hypothesis appropriately predicts the L2A of Spanish viewpoint aspect by L1 speakers of English (see Section 4.6 for more discussion of these studies). Cho and Slabakova (2014) likewise find empirical support for the FRH in the L2 acquisition of Russian indefinite determiners by L1 speakers of English and Korean. Hwang and Lardiere (2013) also provide evidence in favour of the hypothesis from the L2 acquisition of plural marking in Korean by L1 English speakers. Guijarro-Fuentes (2012) finds more mixed evidence, suggesting that additional constraints affect the L2 acquisition of Spanish differential object marking, but the results are nonetheless consistent with the FRH. Consequently, there is substantial empirical support that the FRH is an appropriate way to understand the role of cross-linguistic influence in L2 acquisition. It is therefore no surprise that Putnam and Sánchez (2013) extend this hypothesis to understand how cross-linguistic influence takes place in the context of heritage language acquisition. Before examining their model, I will first briefly engage with the question of L1 attrition.

2.4.2 A note on first language attrition

Evidence of the phenomenon of L1 attrition, defined as grammatical change taking place in an L1 grammar under extensive exposure to L2 input[5], has challenged some traditional generative assumptions about the 'end-state' of L1 acquisition in which it is assumed that linguistic knowledge is stable after linguistic maturity (Domínguez & Hicks, 2016: 59). However, the Minimalist Program and its conceptualisation of cross-linguistic variation as arising from feature differences in the lexicon allows for "the possibility of grammatical change within I-languages as a 'lexical' change, since grammatical properties are encoded in the feature specifications of lexical items (Domínguez & Hicks, 2016: 61).

[5] An alternative view also exists in which "every bilingual is an L1 attriter" due to effects on linguistic performance rather than linguistic knowledge (Schmid & Köpke, 2017: 642). In line with the focus on linguistic knowledge throughout this chapter, I maintain this focus in the discussion of attrition here, although this area could be separately termed 'L1 grammatical attrition'.

Hicks and Domínguez (2020) apply Lidz and Gagliardi's (2015) model of L1 acquisition to advance an 'attrition via acquisition' model of L1 attrition. Unlike for L1 acquisition, where the grammar incrementally develops towards a stable 'endstate', in L1 attrition a stable L1 grammar changes following "sufficient exposure to substantially different input" that "may reinvoke the inference engine" (Hicks & Domínguez 2020: 159). Another difference between L1 acquisition and L1 attrition is that the input that may become intake and lead to the restructuring of the L1 grammar can come from multiple sources in L1 attrition, whereas the only relevant source of input in L1 acquisition is in the L1 (Hicks & Domínguez, 2020: 152), or both L1s in the case of simultaneous bilinguals. Figure 3 provides a graphical representation of how Hicks and Domínguez (2020) have adapted Lidz and Gagliardi's (2015) model for the case of L1 attrition.

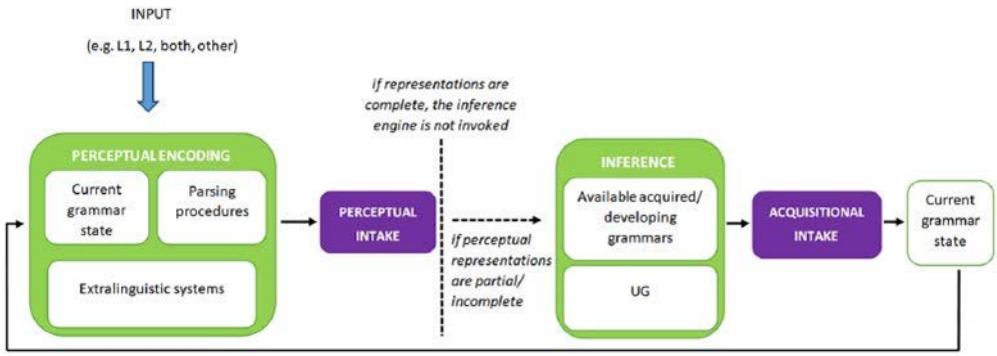


Figure 3: Hicks and Domínguez's (2020: 152) adaptation of Lidz and Gagliardi's (2015) model of L1 acquisition

In Hicks and Domínguez's model (2015: 153), if the input from all languages can be accommodated within the representations of the current grammar(s) at the same level as the perceptual intake, the individual will not use the inference engine to refine the representations. However, if the representations require further refinement to allow parsing, the inference engine will be invoked, which accesses all current grammars and UG. As such, this refinement process, during which all available grammars are activated, is where the cross-linguistic influence that underlies grammatical attrition is argued to take place. Framed in Minimalist and Feature Reassembly terms, Hicks and Domínguez argue that this cross-linguistic influence in L1 grammatical attrition happens as a result of the competing grammar "supplanting functional feature assemblies specified on a given lexical item of the dominant input language variety" (2020: 153). Crucially, the competing variety is not necessarily an L2, but can also be a separate variety of the L1, as in the case of speakers of Caribbean and non-Caribbean varieties of Spanish in Miami (Domínguez & Hicks, 2016).

As such, Hicks and Domínguez's (2020) 'acquisition via attrition (AvA)' model can clearly be understood as a model that seeks to explain how the process of Feature Reassembly argued for in

L2 acquisition (e.g. Lardiere, 2008) can take place in reverse, with the L2 or competing variety of the L1 grammar leading to reassembly taking place in the L1. Recall that attrition or reanalysis of the grammar has been shown to take place for certain grammatical properties in heritage language acquisition (see Section 1.4). In the case of heritage speakers, this reanalysis of grammatical knowledge is conceptually different to the process of L1 attrition as observed with adult bilinguals as the reanalysis of the grammar in heritage language acquisition takes place before the grammar has reached a stable state. In other words, the reassembly or de-selection of the relevant features takes place whilst the inference engine is still active for L1 acquisition in heritage language acquisition, but substantially later and following reactivation for L1 attrition. Consequently, in the remainder of the thesis I will refer to grammatical attrition in heritage speakers as child L1 attrition or heritage language attrition to distinguish it from the case of L1 grammatical attrition in adults.

2.5 Heritage language acquisition under Feature Reassembly

In Section 1.4, I defined a heritage speaker as an early bilingual speaker for whom various language-external factors can result in highly heterogeneous grammatical outcomes. Meisel (2011) summarises the broad consensus arising from generative research into L1 acquisition as follows:

> The gift for language which manifests itself in the effortless acquisition of language by toddlers can safely be qualified as a species-specific endowment of humans… except for pathological cases, for example children who suffer from brain damage, one will never find native speakers who acquired incomplete grammatical knowledge of their language.
>
> **Meisel, 2011: 13**

Yet, such incomplete grammatical knowledge of a language is precisely what has been claimed to obtain for heritage speakers, whose grammatical outcomes in this native language are highly heterogeneous along a continuum. In this section, I consider how the processes of Feature Selection, Feature Assembly and Feature Reassembly as originally proposed in or adapted to the contexts of L1 acquisition, L2 acquisition and L1 attrition may obtain in the case of heritage language acquisition. After this, I focus specifically on Putnam and Sánchez's (2013) model of 'Revised Feature Reassembly'.

2.5.1 The potential loci of difficulty in a Minimalist account of heritage language acquisition

Recall from Section 2.4.1 that Domínguez, Arche and Myles (2011) provide illustrations to demonstrate how Feature Reassembly takes place in L2 acquisition, and here I adapt their illustrative style to demonstrate how feature selection, feature assembly and feature reassembly may be affected in heritage language acquisition. The first and necessary ingredient is that the input contains evidence for two grammars that differ in the selection and assembly of features, as illustrated using features F1-F7 in Figure 4.

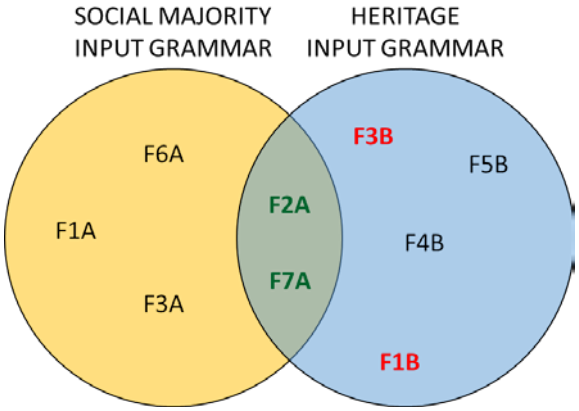


Figure 4: Two grammars which select different features and assemble features in different ways (after Domínguez, Arche & Myles, 2011)

In Figure 4, Grammar 1 selects features F1, F2, F3, F6, and F7; and Grammar 2 selects features F1, F2, F3, F4, F5, and F7. Of the four features common to both languages, features F1 and F3 are assembled in different ways in the two languages, whereas features F2 and F7 are assembled in the same way in both languages. In this illustrative example, assuming successful acquisition of the majority language, we would expect the processes of Feature Selection and Feature Assembly to be successful for F2 and F7 in the heritage language, whereas the heritage speaker might encounter some difficulties acquiring features F1, F3, F4, and F5 in the heritage language. For features F1 and F3, cross-linguistic influence from the majority language may lead to difficulties in Feature Assembly, whereas Features F4 and F5 may not be successfully selected. Of course, either of these issues may be present from primary linguistic exposure, or they may obtain from reanalysis as dominance shifts towards the majority language throughout childhood. In this case, I have not elaborated on additional factors that may also impact what gets acquired and when, especially in the heritage language, for which I have already considered that factors such as input quantity, input quality and processing constraints (e.g. Polinsky & Scontras, 2020) will contribute to the learnability of different features.

However, following Domínguez, Arche and Myles' (2011) argumentation with respect to L2 acquisition, a key difference between the two is that cross-linguistic influence is likely to play a larger role in cases where the features are selected in both languages but assembled in different ways. This difference will likely hold because the influence can only be indirect in the case of initial Feature Selection, whereas the influence can be direct in the case of initial Feature Assembly. By this, I mean that the majority language only provides additional cumulative lack of evidence for a feature to be selected in the heritage language, whereas it provides a competing analysis in the case of the assembly being different in the two languages.

Recall from Section 1.4 that Domínguez, Hicks and Slabakova (2019) identified four logical outcomes of heritage language acquisition. These were: first, target-like acquisition of a monolingual-type baseline grammar; second, target-like acquisition of a contact-type baseline grammar; third, reanalysis of representations that had previously been acquired from the baseline grammar; and fourth, 'incomplete acquisition' of the baseline grammar. To this list I added the special case of diachronic change extension identified by Silva-Corvalán (1994). As such, I propose that the following list appropriately characterises the possible outcomes of heritage language acquisition in feature-based terms on a property-by-property basis:

1. Convergent Feature Selection and Feature Assembly with respect to the baseline grammar
2. Divergent Feature Assembly with respect to the baseline grammar
3. Divergent Feature Selection with respect to the baseline grammar
4. Reanalysis of Feature Selection and Feature Reassembly with respect to a previously acquired state

In this last case, this reanalysis may result from further reductions in input, cross-linguistic influence and processing limitations (e.g. Polinsky & Scontras, 2020).

2.5.2 Putnam and Sánchez's model of Revised Feature Reassembly

Montrul (e.g. 2002, 2008) and Silva-Corvalán (2003), amongst others, proposed that the primary factor that distinguished heritage speakers from other native speakers of a language and led to the noticeably different acquisition outcomes was the quantity of input. Since Silva-Corvalán (2003) refers to these outcomes as the "linguistic consequences of reduced input" (p. 375), this position could be termed the *Reduced Input Hypothesis*. This hypothesis, that often when heritage speakers diverge from the baseline this is specifically related in some way to the conditions of reduced input associated with bilingualism in the specific sociolinguistic context of heritage speakers, is widely assumed in articles that seek to articulate the value and purpose of heritage

language research (e.g. Benmamoun, Montrul & Polinsky, 2013; Scontras, Fuchs & Polinsky, 2015; Lohndal *et al.*, 2019; Polinsky & Scontras, 2020). However, Putnam and Sánchez (2013) suggest that the field has an "(over) reliance on the notion of "insufficient input"" (p. 481) for explaining why heritage speakers typically diverge from the baseline grammar. More strongly, they assert that since there is not a clear consensus regarding the questions about the necessary amount of input for L1 acquisition to take place, appealing to this notion in the context of heritage language acquisition is not appropriate (p. 487).

Instead, Putnam and Sánchez (2013) propose that since language acquisition requires the learner to have turned information in the input into intake for acquisition, the more relevant question is whether heritage speakers are able to generate sufficient intake in the heritage language, especially when the heritage speakers' language use and language environment leads to comparatively greater intake in the majority language. As such, Putnam and Sánchez (2013) argue that relevant levels of activation of the heritage language and majority language grammars in the heritage speakers' mind can explain why it becomes more difficult to generate intake in the heritage language, and thus why they diverge from the baseline. In principle, the model can also account for differences in whether the heritage language representations change under influence from the majority language or if the change only affects online production (see Perez-Cortes, Putnam & Sánchez, 2019). In order to accommodate the bilingual continuum of heritage speakers (Silva-Corvalán, 1991; Montrul, 2016; Polinsky, 2018a), Putnam and Sánchez (2013: 489-490) explicitly describe four broad stages of cross-linguistic influence from the majority language in the heritage language. I quote this four stage model, in which L1 refers to the heritage language and L2 to the majority language, below.

> Stage 1: Transfer or re-assembly of some FFs [Functional features] from the L2 grammar to L1 PF [Phonological features] and semantic features which may coincide with the activation of L2 lexical items on a more frequent basis from the standpoint of linguistic production;
>
> Stage 2: Transfer of re-assembly of massive sets of FFs from the L2 to L1 PF and semantic features, while concurrently showing significantly higher rates of activation of L2 lexical items than L1 lexical items for production purposes (i.e., they might code-switch more than bilinguals in the previous situation);
>
> Stage 3: Exhibit difficulties in activating PF and semantic features (as well as other FFs) in the L1 for production purposes but are able to do so for comprehension of some high frequency lexical items; and,

> Stage 4: Have difficulties activating PF features and semantic features (as well as other FFs) in the L1 for both production and comprehension purposes.
>
> **Putnam and Sánchez, 2013: 489-490.**

In terms of Feature Reassembly as I have discussed it so far, I have been discussing what Putnam and Sánchez (2013) refer to as 'formal features'. It is immediately clear that a heritage speaker at Stage 4 of the model would correspond to what has been described in the literature as an 'over hearer' of the heritage language (e.g. Au *et al.*, 2002), whereas a speaker at Stage 1 would be a much more confident user of the language. Perez-Cortes, Putnam and Sánchez (2019) have slightly expanded this four stage model to include an additional 'Stage 0', at which the heritage speakers do not show any divergence from the baseline grammar. In view of the fact that the stages of Putnam and Sánchez's model are expressed in terms of 'feature reassembly', and the fact that they recognise that this developmental phrase originates with Lardiere's FRH, Fernández-Dobao and Herschensohn (2020: 776) refer to Putnam and Sánchez's model as the "Revised Feature Reassembly" model. Perez-Cortes, Putnam and Sánchez (2019), validating the suggestion that the model can separately account for majority language influence affecting online production and the I-language representations themselves, use the phrase "Differential Access" to describe this effect, which would also be an elegant description of the model. In view of the emphasis on the developmental process itself rather than on the precipitator of the process, I mostly use the label Revised Feature Reassembly to discuss the model.[6]

2.5.3 A challenge to the Revised Feature Reassembly model

One specific pair of assumptions in the Revised Feature Reassembly model warrants especially closer attention. This is that (i) the initial activation of features, which I assume to be equivalent to feature selection and feature assembly, successfully takes place before the heritage grammar diverges from the baseline, and (ii) that this subsequent divergence can be characterised as 'transfer or reassembly' from the majority language, whether this takes place at the representational level or only results in variability in online production (Putnam & Sánchez, 2013; Perez-Cortes, Putnam & Sánchez, 2019; Putnam, Perez-Cortes & Sánchez, 2019).

The first potential issue with these assumptions is that it is not empirically clear that the initial activation of features is necessarily successful in heritage language acquisition. Indeed, Putnam and Sánchez argue that their model provides "a promising way of analysing the process and the

[6] Even so, I occasionally refer to Differential Access when a focus on the precipitation of the reassembly process is more relevant.

result of incomplete acquisition, with the eventual dismissal of the notion of 'incomplete' acquisition in the formation of heritage language grammars" (2013: p. 480), noting that this aim has also been expressed by other authors (i.e. Pascual y Cabo & Rothman, 2012:). Above, I noted that within the Minimalist Program, in additional to convergence on the baseline grammar, the potential loci of divergence from the baseline in heritage grammars could be feature selection, feature assembly, or feature reassembly. Silva-Corvalán (2018) notes that the patterns of behaviour of her grandchildren suggest that, for specific properties, they had not actually acquired the Spanish grammar, not that they had successfully acquired the Spanish system and subsequently become more English-like. Whilst Silva-Corvalán's data is limited because it mostly reflects naturalistic language use, and may therefore underestimate the representational capabilities of her children, the assumption that heritage speakers will only diverge from the baseline subsequent to initial acquisition certainly seems too strong.

The other potential issue associated with these assumptions relates to the term 'transfer'. Classically, the term 'transfer' is associated with explanations of cross-linguistic influence in L2 acquisition, specifically at the initial stage, as in the Full Transfer/Full Access model (Schwartz & Sprouse, 1996). Certainly, in the case of the FRH as originally proposed (Lardiere, 2008, 2009), this is how the transfer of feature assemblies from the L1 grammar would be understood. However, heritage speakers acquire both languages naturalistically whilst the language acquisition device or inference engine is still active for L1 development,[7] and as such, their initial linguistic knowledge in the heritage language may be derived from multiple sources in addition to UG. The potential candidates include the heritage language input, the majority language input, and the currently acquired grammar of the majority language in the child's mind. Where L2 acquisition can safely be characterised as involving wholesale transfer from the L1 at the initial state (Schwartz & Sprouse, 1996), the role of transfer is conceptually more problematic in the case of heritage language acquisition. As such, it is worth discussing this further.

Researchers in the field of L3/Ln acquisition have begun to make a principled distinction between transfer and cross-linguistic influence that would be equally applicable to the case of heritage speakers. For example, Rothman, González Alonso and Puig-Mayenco (2019) consider transfer as affecting the internal grammatical representations of the L3 grammar, including the initial and subsequent stages, with non-representational influence from the L1 and L2 being understood as cross-linguistic effects on performance, with transfer and online effects both being sub-types of

[7] This overlooks a potentially relevant distinction between heritage speakers who are simultaneous bilinguals and those who are sequential bilinguals. The remaining category of early bilinguals, child L2 learners, are not heritage speakers (Polinsky, 2018a).

cross-linguistic influence. Contra this position, and in line with their L2 model, Schwartz and Sprouse (2021: 16) understand transfer to be the mechanism that determines the initial state and that cross-linguistic influence reflects anything that happens subsequently in the development of a grammar, whether this is at the representational or performance level. Whilst the representational-performance distinction is important to make, the way the term has historically been used in L2A makes the distinction proffered by Schwartz and Sprouse (2021) more consistent across sub-fields of language acquisition.

The point of this brief digression is to highlight that 'transfer', in the Schwartz and Sprouse (1996; 2021) sense of the term, does not actually happen in heritage language acquisition since the initial state of the heritage grammar is always the default initial state S_0 provided by UG, regardless of whether the majority language is acquired simultaneously or sequentially. When Putnam and Sánchez (2013) use the phrase, they clearly intend the same sort of representational meaning as Rothman, González Alonso and Puig-Mayenco (2019), but this is redundant in the context of the same process being referred to as 'reassembly' in the model, and potentially unhelpful given the different meanings of the two phrases in the original proposal of the FRH.

2.5.4 Key tests for the Revised Feature Reassembly model

In addition to whether patterns of divergence in heritage grammars is consistent with the FRH (Lardiere, 2009), there are essentially two main claims of the Revised Feature Reassembly model that can be empirically tested to ascertain whether it provides a suitable account of the heritage language acquisition process. These relate to the effects of language access on the heritage language grammar, especially compared to the amount of input the heritage speaker receives, and to whether any representational or online divergence from the baseline grammar obtains that cannot be characterized as a result of feature reassembly under influence from the majority language, or more generally a restructuring of the grammar under reduced access conditions, whether this is directly towards the majority language or further out.

Given that Putnam and Sánchez (2013) predicate their model on the significance of intake rather than input, with intake being intimately related with relative activation of the grammar, it is reasonable to assume that under Revised Feature Reassembly, divergence from the baseline would correlate with measures of language activation. Perez-Cortes, Putnam and Sánchez (2019) make exactly this argument; they argue that proficiency reflects activation, which in turn reflects automaticity of access to the grammatical representations, and thus the association between Spanish heritage speakers' proficiency and knowledge of the subjunctive mood is interpreted as support for their model. Coincidentally, it has been widely established (e.g. Montrul, 2016), that

more implicit proxies of language proficiency, such as lexical access, rather than formal measures of proficiency developed for L2 proficiency purposes are often more accurately informative for heritage speakers because they have less practice doing the sorts of metalinguistic activities required in the formal tests; as such, the measures of proficiency that are appropriate for use with heritage speakers may have a stronger association with their language activation than other proficiency measures. An alternative measure of how strongly the heritage grammar is activated can be found in how frequently the heritage speakers use the language in proportion to the majority language; if the heritage speaker is regularly processing the grammar for output, they are accessing it more often, but crucially 'inhibiting' the majority language more as well.

As to the specific claim that measures of language access such as these will be more useful for understanding heritage language acquisition than measures of input quantity, as assumed under the Reduced Input Hypothesis, this can be verified by establishing whether measures of language access or input quantity have better predictive power for heritage speakers' grammatical outcomes. There are several established methods for establishing input quantity in language acquisition, many of which can easily be deployed with child and adult heritage speakers to ascertain an approximate measure of input quantity (see Unsworth, 2019).

As to the claim that initial 'activation' of the features of the heritage language will have taken place successfully before influence from the majority language affects the heritage grammar, only longitudinal data from heritage speaker children over the course of several years of grammatical development would be able to provide definitive confirmation or falsification of this claim. However, it is possible to infer whether divergence from the baseline occurred earlier in the acquisition process—i.e. as a result of divergent initial feature selection, feature assembly or both—by investigating cross-sectional data from heritage speakers at different ages.

2.5.5 Partial evidence for the Revised Feature Reassembly model

Cuza and Pérez-Tattam (2016) investigated the production of grammatical gender and associated properties by 32 child heritage speakers of Spanish, finding that gender assignment and gender agreement errors were much more common among the heritage speakers than similarly aged monolingual controls. In addition to the production task, Cuza and Pérez-Tattam also collected information about language use among the heritage speakers, and used this data to examine whether there were any correlations with the gender assignment and agreement rates; the results of these correlations were mixed, but provided partial evidence that there was a relationship between measures of language use and restructuring of the grammar. As such, Cuza and Pérez-Tattam (2016) argue that the difference between the monolingual and heritage

speaker children represents "a restructuring of L1 [+strong] gender features and the mapping of English [-strong] features onto their Spanish lexical items" (p. 64), in line with the Revised Feature Reassembly model.

Perez-Cortes (2016) studied the production and comprehension of subjunctive morphology by Spanish heritage speakers. Whilst her participants' production typically diverges from target-like usage of subjunctive morphology across all proficiency levels, the advanced group's comprehension remains target-like, with comprehension of the subjunctive being less accurate in intermediate and less proficient heritage speakers. Perez-Cortes, Putnam and Sánchez (2019) interpret these results as supporting the Revised Feature Reassembly model, specifically in terms of how the data reflects the distinction between production and comprehension that they argue may be possible in the model.

More recently, in a comparison of Spanish child L2ers and heritage speakers in a dual-immersion education setting, Fernández-Dobao and Heschensohn (2020) have also found evidence that is compatible with Revised Feature Reassembly. The authors investigated the development of number agreement and stem accuracy in the Spanish Present tense for children aged 9-10, of whom 21 were heritage speakers and 41 were L2 learners, in addition to a control group of 15 monolingual Spanish children in Spain. Results of an oral mode picture matching task and two written production tasks indicated that the heritage speakers were consistently more accurate than the child L2ers, and almost always comparably accurate to the monolingual children. The only exception was for stem-changing verbs, where the heritage speakers were less accurate than the monolinguals (p. 795). The child heritage speakers were all literate in Spanish, and most were dominant in Spanish (p. 786); the fact that they received formal schooling in Spanish will have also ensured that their relative activation of Spanish compared to English is not as low as it would be for children in English-only schools. As such, Fernández-Dobao and Herschensohn (2020) argue that these findings are in line with the Revised Feature Reassembly model of Putnam and Sánchez (2013).

One note about each of these studies is that, ultimately, they do not provide strong support for Putnam and Sánchez's model. In all three cases, the data is 'in line with' the broad predictions of the model, but it is arguable whether they explicitly identify a prediction according to which they could falsify the hypothesis. For example, if Perez-Cortes's participants had had similar production and comprehension profiles, these could be interpreted as being at a different stage within the model. Therefore, despite the partial evidence that the model can usefully describe aspects of heritage grammars, it has yet to be formally tested.

2.6 Summary

In this chapter, I have provided an extended introduction to the theoretical assumptions of Putnam and Sánchez's (2013) Revised Feature Reassembly model of heritage language acquisition. I began by generally describing the Minimalist Program of research within the context of generative grammar (e.g. Chomsky, 1995), as well as the more recent elaboration of three factors of language design (e.g. Chomsky, 2005) that have become central to many formal elaborations of language acquisition within Minimalist research. Then, I considered the theoretical assumptions regarding the acquisition of a first language under the model, principally in terms of the UG-constrained processes of feature selection and feature assembly by which the L1 grammar develops, alongside a brief introduction to some of the recent proposals of how these proposals operate in the context of the three factors of language design. After this, I reviewed the application of the Minimalist Program to the context of L2 acquisition, and provided a detailed treatment of the Feature Reassembly Hypothesis (Lardiere, 2009) that forms the basis of the Revised Feature Reassembly model, together with a brief digression to consider L1 attrition and why this is different than heritage language attrition.

After this background was put in place, I then considered how the various outcomes of heritage language acquisition that have been argued to obtain in the field are accounted for within the processes of the Minimalist approaches to language acquisition outlined above. I then elucidated the core proposals of Putnam and Sánchez's (2013) model of heritage language acquisition, in which they argue that intake is more important than input for acquisition outcomes, and that activation of the two grammars in the bilingual mind will affect whether they can generate sufficient intake in the heritage language to maintain the grammar. Putnam and Sánchez assume that the initial acquisition process for heritage speakers will have reached an effectively steady state before the reassembly they describe takes place. I also reviewed the empirical support for the Revised Feature Reassembly model so far. After this, I noted potential conceptual issues relating to the assumption of target-like acquisition of the heritage grammar obtaining before reassembly from the majority language can take place and the conflation of the notion of transfer and reassembly in the model.

Finally, I identified two key claims by which the suitability of the Revised Feature Reassembly model can be tested. In view of the claim that reassembly results from reduced activation of the heritage grammar, a key test for the model is whether language access measures are associated with the outcomes that obtain for heritage speakers, and, further, whether this association is better than any association for input quantity measures. The other key claim related to the fact that divergence from the baseline grammar is only conceived of as 'reassembly' in the model, as

the initial acquisition process is argued to have completed successfully; longitudinal data or implications from age-based comparisons, or the uncovering of effects that cannot be considered as reassembly would challenge this assumption. In the next chapter, I will establish that viewpoint aspect, and specifically the cross-linguistic differences in feature assembly of viewpoint aspect morphology between English and Spanish, make it an ideal grammatical property to assess these claims.

Chapter 3 Time after Time: Constructing Viewpoint Aspect

3.1 Introduction

Aspect is used to refer to two different grammatical phenomena: viewpoint aspect and lexical aspect. Lexical aspect, also known as aktionsart, is related to the 'inherent meaning' of verb phrases (Comrie, 1976: 41). In short, verb phrases can be divided into four broad groups using a small number of axes of differentiation, a proposal attributed to Vendler (1967). The resulting categories are known as states, activities, achievements and accomplishments. Viewpoint aspect, also known as grammatical aspect, is a semantic universal that is related to "different ways of viewing the internal temporal consistency of a situation" (Comrie, 1976: 3). It is this second type of aspect that concerns us here. Whilst there is an association and interaction between both types of aspect in naturally occurring language, they constitute two separate systems. Lexical aspect is syntactically derived within the lexical projection of the verb phrase and its arguments (Borer, 2005), whereas viewpoint aspect derives within the functional architecture of the inflectional phrase (Demirdache & Uribe-Etxebarria, 2000). As such, points relating to lexical aspect will only be raised where helpful to the discussion, and the focus here is on viewpoint aspect.

In this Chapter, I begin with a brief illustration of the differences between English and Spanish that need to be captured by a theoretical approach to viewpoint aspect. I then briefly present two theoretical accounts that have been presented in recent generative research. First, Giorgi and Pianesi's (1997) explanation of the differences as arising from a difference in feature selection and feature assembly. Then, I review Arche's (2006, 2014) model, and note how the deconstruction of the notion of 'imperfective' in her framework can more adequately explain the cross-linguistic differences. Next, I discuss regional variation in the association of perfective meaning to the Preterite and Present Perfect form in the Spanish-speaking world. Finally, I model the cross-linguistic differences between English and Spanish, showing how Arche's proposal allows clear predictions of where vulnerability in the acquisition and maintenance of viewpoint aspect will obtain to be made under the Revised Feature Reassembly model (Putnam & Sánchez, 2013).

3.2 Setting the scene

Before providing a full theoretical account, I here introduce the necessity of the semantic category for adequately describing the linguistic differences between languages. If we take a

simple contrast between some English and Spanish forms, although each of them has past reference, there are substantial differences in meaning that need to be explained.

(1) Mary **played** tennis ENGLISH SIMPLE PAST

(2) Mary **was playing** tennis ENGLISH PAST PROGRESSIVE

(3) María **jug-ó** al tenis SPANISH PRETERITE
María play-PFV.3PS to.the tennis
'Maria played tennis'

(4) Maríá **jug-aba** al tenis SPANISH IMPERFECT
María play-IPFV.3PS to.the tennis
'Maria played tennis'; 'Maria was playing tennis'

In particular, note that the Spanish Imperfect in (4) can be translated by both English forms (1) and (2), and that likewise the English Simple Past can be translated by both Spanish forms (3) and (4). This is exemplified in Figure 5 below:

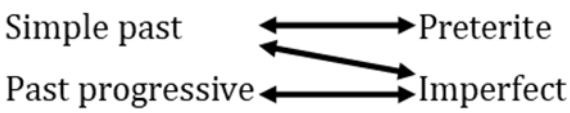


Figure 5: Translation mappings of English (left) and Spanish (right) past tense verb morphology

In addition to these forms, there is a wider range of forms that can be functionally equivalent in the right context. Specifically, the English periphrastic constructions 'used to' and 'would' can be used instead of the Simple Past in contexts where the Spanish Imperfect would be used, and likewise the Spanish periphrasis 'soler + V' can be used for the same purpose. Spanish also has a dedicated pair of past progressive forms too, which are constructed in a similar way to the English Past Progressive, shown in the examples below.

(5) María **estaba jugando** al tenis cuando la vi
Maríá be-PAST-IMP play-ing to-the tennis when her see-PAST-PRET-1SG
'Maria was playing tennis when I saw her

(6) María **estuvo jugando** un partido de tenis durante tres horas, pero no lo terminó
María be-PAST-PRET play-ing a match of tennis during three hours but NEG it finish-PAST-PRET
'Maria was playing a tennis match for three hours, but she did not finish it'

As such, a theoretical account of viewpoint aspect needs to be able to explain both the differences we see between the forms within the individual languages, as well as the cross-linguistic differences in how different meanings are associated with different forms. Evidence from L2 acquisition (see a brief summary in Section 4.6) and heritage language acquisition (see

Sections 4.3 and 4.5) shows that L1 English learners of Spanish as an L2 and Spanish heritage speakers in English dominant contexts often struggle to acquire the Preterite-Imperfect distinction, and especially find the Imperfect difficult, and a theoretical account will have to provide a principled explanation for this cross-linguistic effect as well.

3.3 Giorgi and Pianesi (1997)

Giorgi and Pianesi (1997) present an analysis in which the principal component of viewpoint aspect is a notion of 'boundedness'. If an event is 'bound' or completed, then it gives a [+perfective] reading and this is thus reflected in the morphology as a perfective verb form. On the other hand, 'unbounded' or incomplete, events have a [-perfective] reading, which is then reflected in the morphology as an Imperfect or imperfective verb form. Syntactically, this proposal amounts to an Aspectual Phrase (AspP) projection within the functional architecture of TP/IP in the clause, which hosts the [±perfective] feature in its head. The tree diagram in Figure 6 shows one derivation of this system, including further functional projections of the clausal architecture:

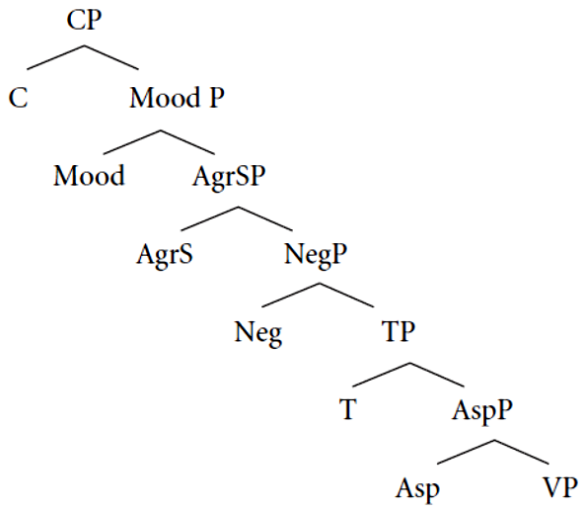


Figure 6: Viewpoint aspect as part of the functional projection in Giorgi and Pianesi's (1997) approach. Adapted from Montrul, 2004: 91.

Under Giorgi and Pianesi's (1997) analysis, the Spanish language grammaticalizes a distinction between the Preterite and Imperfect verb forms reflecting the fact that each form is specified as having a [+perfective] or [-perfective] feature respectively. Conversely, the authors maintain that this distinction is effectively entirely irrelevant for English, which associates the feature [+perfective] with the categorical distinction between verbs and other lexical categories in the lexicon (see Montrul & Slabakova, 2003: 360-362 for a concise summary of this position). Thus, in this analysis, Spanish selects both the [+perfective] and [-perfective] features associated with viewpoint aspect, whereas English only selects the [+perfective] feature, with the Simple Past

verb form only reflecting the temporal feature [+past]. As such, this framework makes clear predictions regarding the learnability of Spanish viewpoint aspect for L1 or dominant speakers of English, which have been shown to be accurate with highly proficient learners (e.g. Montrul & Slabakova, 2003).

However, there are some issues with this approach. The first of these is the existence of the English Past Progressive. If the [±perfective] feature is supposed to capture the distinction in terms of completion or boundedness, then the logical interpretation of this verb form suggests that it has a [-perfective] feature. At the very least, the existence of the Past Progressive means that this feature is indeed selected in English, and it also raises questions as to whether English verbs are inherently [+perfective] if they can be used with a progressive form. Salaberry (2008: 5) makes a similar point from a conceptual standpoint; he argues that "English speakers already have a representational knowledge of all the aspectual concepts instantiated in Spanish past tense-aspectual morphology", and that the difficulty resides in mapping these concepts onto different morphological forms in the two languages.

Another issue with this approach is the fact that whilst the English Simple Past can correspond to the Spanish Preterite ([+perfective]) and Imperfect ([-perfective]) verb forms, as seen in examples 3-6 above, this does not necessarily mean that it only encodes temporal information ([+past]). Another possibility is that the Simple Past does encode aspectual information, but that the verb form is ambiguous with respect to perfectivity unless the context more clearly specifies whether the intended interpretation is [+perfective] or [-perfective]. If the Past Progressive form explicitly encodes the [-perfective] aspectual feature and [+past] tense feature, then it is logical to assume that the Simple Past form also encodes aspectual information in addition to tense.

Furthermore, the notion that the [±perfective] feature arises because of whether the situation described is complete or bound in Giorgi and Pianesi's (1997) analysis is also somewhat conceptually difficult to verify. Generally, the Spanish Preterite associated with the [+perfective] feature usually entails completion, whereas the Imperfect form associated with the [-perfective] feature is more ambiguous with respect to completion. However, the Spanish Imperfect is used in sentences like example (7), which refers to a clearly completed set of instantiations of a situation:

(7) De niña, Anita jugaba mucho al tenis
DE child Anita play-PAST-IMPERFECT a lot AL tennis
'As a child, Anita played a lot of tennis'

Although this example uses the Imperfect verb form, and as such has the [-perfective] feature in Giorgi and Pianesi's (1997) account, the situation is clearly understood as being bounded. If

boundedness is the primary semantic content of the [±perfective] feature, we should not expect to find [-perfective] verb forms in contexts that are only consistent with a bound interpretation.

In sum, this analysis is not powerful enough to capture the entire range of interpretative readings that are encoded by the Imperfect and Preterite morphology. More importantly, Giorgi and Pianesi's (1997) account of viewpoint aspect does not adequately account for cross-linguistic differences in the mapping of morphological forms to semantic meanings.

3.4 Arche (2006, 2014)

An alternative attempt to explain differences in how aspectual meanings are expressed cross-linguistically is found in Arche (2014), who argues that aspectual interpretations are semantically universal, and represent a constellation of features rather than a single feature with binary values. As such, the locus of cross-linguistic variation for viewpoint aspect under this approach is in how the features are assembled onto different lexical items, rather than whether individual languages select the appropriate aspectual feature. In other words, the underlying semantics and syntax if the same, with languages differing in terms of how these representations are realised.

Arche's framework stems from an influential theoretical proposal put forth by Reichenbach (1947), and subsequently refined by other authors. In Reichenbach's (1947) system, tense-aspect meanings are obtained through the relative ordering of three points in time: the speech time (S), event time (E), and reference time (R). The ordering of E and S yields tense in the traditional understanding, whereas the location of R relative to both of these points in time delimits 24 possible tenses. This basic idea has not been without detractors (especially Verkuyl, e.g. 2019), although Reichenbach's proposal of the reference time (R) has been argued to be necessary on syntactic and semantic grounds to constrain the potential number of temporal relations that can be expressed and therefore acquired (Hornstein, 1990).

Klein (1994) reconsiders Reichenbach's (1947) construction of tense and aspect, concluding that the two categories derive from two independently ordered relationships. In this framework, viewpoint aspect comes from the relative ordering of what Klein terms the 'Time of Situation' (TSit) and 'Topic Time' (TT), which are conceptually similar to Reichenbach's E and R, respectively. Tense is then derived through the ordering of TT and the 'Time of Utterance' (TU), analogous to Reichenbach's S. Klein (1994: 108), argues that imperfective aspect arises when TSit fully includes TT, and perfective aspect is interpreted as TSit partially including TT. In other words, if TT represents a segment of time within TSit, the interpretation is imperfective, whereas when TT represents a time span that extends beyond the bounds of TSit, the interpretation is perfective. Demirdache and Uribe-Etxebarria (2000, 2007) take the semantic content of Klein's proposal and

construct a syntactic derivation that encapsulates the temporal predicates and the ordering of these predicates. This two-stage derivation builds upon earlier work by Stowell (1993) and Zagona (1990) for tense. This proposal effectively amounts to an AspP projection, with the predicate time in the specifier of AspP and the appropriate ordering adverbial in the head position, as shown in Figure 7.

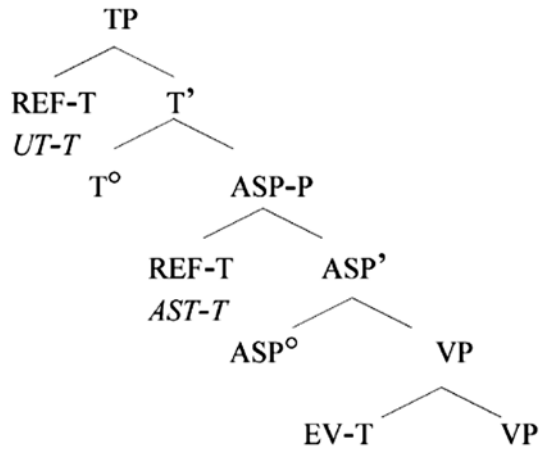


Figure 7: Demirdache and Uribe-Etxebarria's analysis of the syntax of viewpoint aspect (Demirdache & Uribe-Etxebarria, 2007: 333)

As is clear elsewhere in Demirdache and Uribe-Etxebarria's work (e.g. 2007: 338), the semantic content of the ordering adverbials in their proposal are 'within', 'before' and 'after'. As can be seen from the tree diagram, the ordering predicate in T^o links AST-T and UT-T to yield tense interpretation, and the ordering predicate in ASP^o links EV-T and AST-T to yield viewpoint aspect interpretation. EV-T refers to 'event time', AST-T to 'assertion time' and UT-T to 'utterance time'.

More recently, Arche (2006, 2014) has further refined the aspectual model of ordered temporal relations, revising the order of Klein's TT and TSit in establishing aspectual interpretations, 'assertion time' (AT) and 'event time' (EvT) in Ache's notation, to be parallel to the ordering established for tense. The key feature of Arche's (2014) proposal is that it also deconstructs the notion of 'imperfective' viewpoint aspect into three constituent readings: habitual, continuous and progressive. To achieve this, Arche incorporates Verkuyl's (1999) quantification of the predicate into the construction of meaning in grammatical aspect, arguing that the syntactic derivation builds grammatical aspect, as Borer (2005) argues for lexical aspect. This proposal is significant as it allows us to tease apart the ways in which English and Spanish organize the expression of viewpoint aspect in different ways, beyond a mere assertion that viewpoint aspect is ambiguous or under-specified in English.

In sum, Arche (2014) argues that viewpoint aspectual interpretations arise from the constellation of two features: the interval ordering predicate and the quantifier 'Q' feature. In essence the traditional perfective-imperfective contrast is captured by the ordering predicate feature, and as such features in the 'Asp' head of the tree diagrams in Figure 8, whereas the Q feature yields three more precise interpretations of the imperfective (a-c) that better capture the range of cross-linguistic variation.

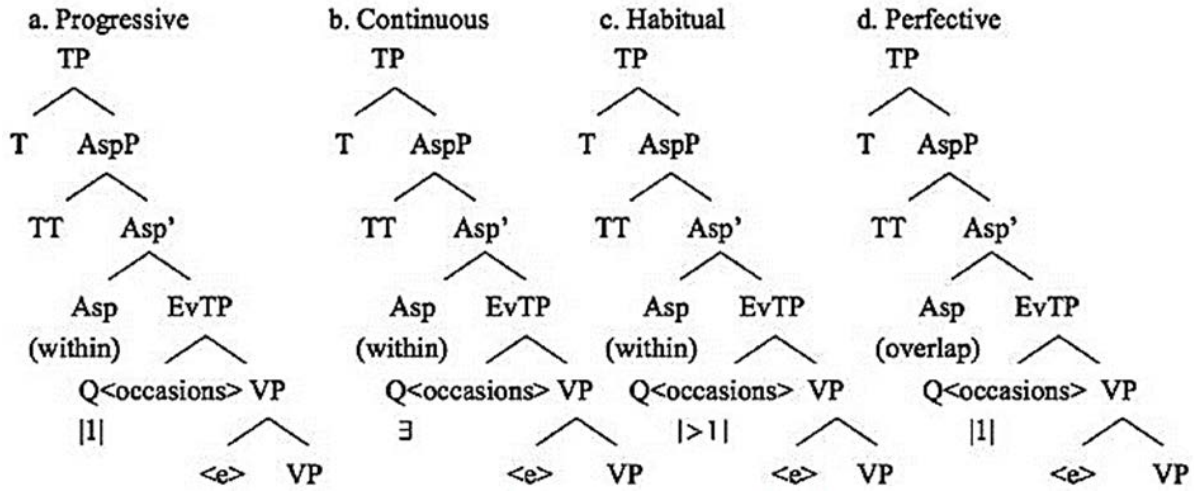


Figure 8: Arche's (2006) proposed syntactic derivation for viewpoint aspect across the four past aspectual readings. Domínguez, Arche & Myles, 2017: 434.

The readings associated with these feature bundles then surface on different lexical items in English and Spanish. For a 'progressive' reading of imperfective aspect, the assertion time in the AspP projection is within the event time of the vP projection [Aspect: within], and there is only one instantiation of the predicate, giving a quantifier of value one [Q=|1|]. This reading is associated with the Spanish Imperfect morpheme (V-aba/V-ía)[8] and progressive construction (copula *estar* V-ndo), and only with the progressive construction in English (be V-ing). For the 'continuous' reading of the imperfective, the assertion time is once again with the event time [Aspect: within], although the predicate simply denotes a state of affairs that holds, and as such the quantification is existential [Q=∃][9]. This reading is associated with the Spanish Imperfect morpheme (V-aba/V-ía) and the English simple past morpheme (V-ed). For the 'habitual' reading of the imperfective, multiple instantiations of the event time take place within an asserted period

[8] All of the examples I give in this paragraph are third person singular, with the exception of the progressive constructions which are infinitival. For simplicity, I also leave irregular stems aside.

[9] This is the specification provided by Arche in 2006; in her 2014 paper she instead argues that continuous readings obtain when there is no quantification. Arche (2006) also posited that the quantifier was hosted in EvTP, the event time phrase, although Arche (2014) later posits that a second AspP hosts the quantifier in its head instead. For the purposes of this dissertation, both of these points are effectively irrelevant, and I adopt the earlier derivation because it yields a uniform structure for all four readings.

[Aspect: within], and as such the quantity reading is greater than one [Q>1]. It is canonically associated with the Spanish Imperfect (V-aba/V-ía) and English simple past (V-ed), although additional periphrastic expressions exist in both languages. Finally, perfective readings arise when the assertion time overlaps with a single instantiation of an event [Aspect: overlap], or indeed fully overlaps with a complete set of instantiations of an event [Q=|1|]. In Spanish, perfective is associated with the Preterite verb form (V-ó/V-ió), whereas perfectivity is associated with the simple past (V-ed) in English. The example sentences below illustrate each of these readings, and the associated morphemes in both English and Spanish.

(8) Henry play**ed** the piece from start to finish
(Perfective: [Tense: past; Aspect: overlap; Q: 1])

(9) Henry play**ed** the piece many times in his childhood
(Habitual: [Tense: past; Aspect: within; Q:>1])

(10) Henry lov**ed** to play that piece
(Continuous: [Tense: past; Aspect: within; Q: ∃])

(11) Henry **was** play**ing** the piece when the fire started
(Progressive: [Tense: past; Aspect: within; Q:1])

(12) Álvaro toc**ó** la pieza por entero
Álvaro play-PRET the-FEM piece by whole
'Álvaro played the whole piece'
(Perfective: [Tense: past; Aspect: overlap; Q: 1])

(13) De niño, Álvaro toc**aba** la pieza muchas veces
of child Álvaro play-IMP the-FEM piece many times
'Álvaro played the piece many times in his childhood'
(Habitual: [Tense: past; Aspect: within; Q:>1])

(14) A Álvaro le gust**aba** tocar esa pieza
DOM Álvaro to-him please-IMP to play that-FEM piece
'Álvaro liked to play that piece
(Continuous: [Tense: past; Aspect: within; Q: ∃])

(15) Álvaro toc**aba/estaba** toc**ando** la pieza cuando empezó el fuego
Álvaro play-IMP/was-IMP play-ING the piece when start-PRET the-MASC fire
'Álvaro was singing when the fire started'
(Progressive: [Tense: past; Aspect: within; Q:1])

As is clear from each of these example sentences, the puzzle of the overlapping meaning between the English simple past and Spanish Imperfect verb forms raised in Section 3.2 is fully resolved in Arche's analysis. Where the English simple past can have a perfective, habitual or continuous reading, the English past progressive can only have a progressive reading. Furthermore, the Spanish examples above clearly show that whilst the Preterite can only have a perfective reading, the Imperfect can have a habitual, continuous or progressive reading. Figure 9, below, shows the semantic content of each reading and the different form-meaning mappings in the expression of viewpoint aspect in English and Spanish:

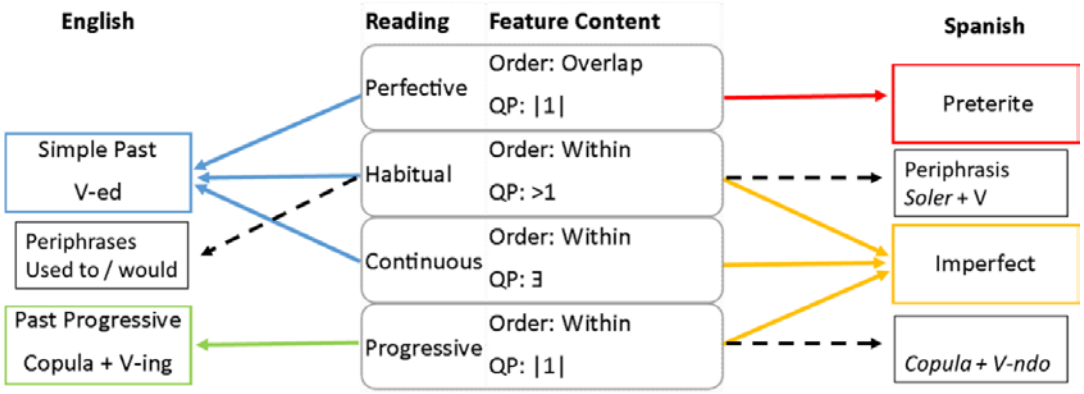


Figure 9: The semantic contents of past viewpoint aspectual readings in Arche's analysis, showing how the meanings map to forms in both English and Spanish. Adapted from Domínguez, Arche & Myles 2017: 437.

As outlined in Section 3.2, both languages have periphrastic forms to express habitual readings; English has the forms 'would + V' and 'used to + V', whilst Spanish has the form 'soler + V', with Imperfect morphology used on the verb soler, the semantic meaning of which is essentially 'to usually do', as well as the two dedicated past progressive forms in Spanish. These are indicated in the smaller boxes with dashed arrows in Figure 9.

Compared to Giorgi and Pianesi's (1997) analysis, this account has greater explanatory adequacy due to its granular approach in which 'imperfective' is deconstructed into various readings. For instance, where Giorgi and Pianesi's account would have English learners of Spanish having difficulty learning that the distinction between [+perfective] and [-perfective], and thus potentially any part of the Preterite-Imperfect distinction, Arche's analysis suggests that we would expect to see greater difficulty with the readings that are associated with different forms in the two languages. Where perfective and progressive readings should continue to be associated with different forms, an English speaker learning Spanish has to dissociate habitual and continuous readings from the verb form used for the perfective reading and associate them with the verb form used for the progressive reading. As such, the habitual and continuous readings would be

predicted to be more difficult for such learners. This is corroborated by Domínguez, Arche and Myles (2011, 2017), in which even advanced learners continued to have residual difficulty with the continuous reading, which is precisely where the cross-linguistic differences are most pronounced.

To summarise, in Arche's framework viewpoint aspect is construed of as a constellation of grammatical features, combining the ordering relationship between the time intervals and the quantification of the situation to yield a reading. A remaining issue, which I have not considered here, is where or how the morphological forms attach to the relevant verbs in the derivation. Although aspectual theory usually sidesteps this issue by leaving bare forms of verbs in trees and not explicitly stating how this is reflected in the final phonological spell out of the sentence, Arche (2014: 809-810) provides trees in which the auxiliary and -ing/-ndo morpheme arise in the aspectual heads, implying that the verb raises through the aspectual projection and the morphology attaches to it in so raising. Whilst plausible for Spanish, a language in which main verbs rise up the inflectional architecture, it is less clear whether this would apply for English as well, a language in which we assume simple inflected forms remain in situ (cf. Mary would often play football / Mary often played football). In the absence of a description of how the syntactic representation of the abstract semantic features result in the insertion of aspectual morphology in the derivation, I leave further discussion of this issue aside.[10]

3.5 Regional variation in the expression of viewpoint aspect in the Spanish-speaking world

Although the perfective-imperfective distinction as manifested in the Preterite-Imperfect contrast is stable throughout the Spanish-speaking world, there is substantial variation in the expression of perfective meaning. Specifically, in several varieties the Present Perfect verb form has come to be associated with recent perfective contexts. Although this is often associated with differences in European and Latin American varieties, the patterns of Present Perfect extension are more complex. In this section, I will briefly outline some of the uses of Present Perfect in perfective contexts, show the extent of this regional variation, and demonstrate the added complexity this distinction of types of perfective creates in the grammatical system. I then note why this regional variation is relevant to the acquisition of viewpoint aspect by Spanish heritage speakers.

[10] Although space precludes discussion of it here, González and Verkuyl (2017) have written a comprehensive rebuttal of Arche's framework; many of their key issues rest on slight misunderstandings of the predicate ordering approach to viewpoint aspect.

The spread of the Present Perfect into perfective contexts in Spain is well documented in many regions of the country (e.g. Howe & Schwenter, 2003: 65). As an example, Schwenter (1994) investigated the distribution of Present Perfect and Preterite in Alicante in Spain, and found that the Present Perfect was overwhelmingly used for perfective events in hodiernal, same day, contexts, while the Preterite was generally used for perfective events in pre-hodiernal contexts (p. 88). Schwenter also found that younger speakers were more likely to use the Present Perfect in pre-hodiernal contexts than older speakers (p. 97), providing synchronic evidence of the diachronic change progressing incrementally. In effect, the Present Perfect can be used to express perfective events; however, this is not the case in every single part of Spain, notably in Galicia (Howe & Schwenter, 2003: 63; Schwenter, 1994: 77). Howe and Schwenter (2003) also consider varieties of South American Spanish in which the Present Perfect has extended into perfective contexts, although they note that this extension is substantially different from the changes observed in Peninsular Spanish, as it "is heavily restricted to non-sequential past time contexts" (p. 71). As such, the use of the Present Perfect in perfective contexts is not identical in the South American and Peninsular contexts. Nevertheless, the same form is extending into perfective contexts in both varieties.

A recent study by González, Jara Yupanqui and Kleinherenbrink (2018) investigated the extent to which Preterite and Present Perfect were preferred in various contexts by speakers of Peninsular, Peruvian and Argentinian Spanish. Although there was substantial variation within the specific contexts, the headline results across all contexts clearly illustrates the substantial regional variation. Overall, they found that Spaniards slightly preferred the use of the Present Perfect to the Preterite, at 52.1%, whilst Peruvians were more conservative, preferring it in only 41.5% of contexts; by contrast, Argentinians preferred the Present Perfect in only 10.6% of contexts.

In the areas that allow the extension of the Present Perfect into perfective contexts, the grammar maps perfective meaning onto two forms, and divides perfective meaning into two categories, one of which maps onto both forms. Although the exact variation is different in each area, extended use of the Present Perfect is typically associated with recentness of the perfective event. As such, the grammars that allow the extension of the Present Perfect are cognitively more complex. On the basis of the literature (e.g Howe & Schwenter, 2003), and the descriptive grammar produced by the Real Academia Española (2010), Figure 10 provides an indication of which regions in Europe and Latin America allow the extension of the Present Perfect into perfective contexts.

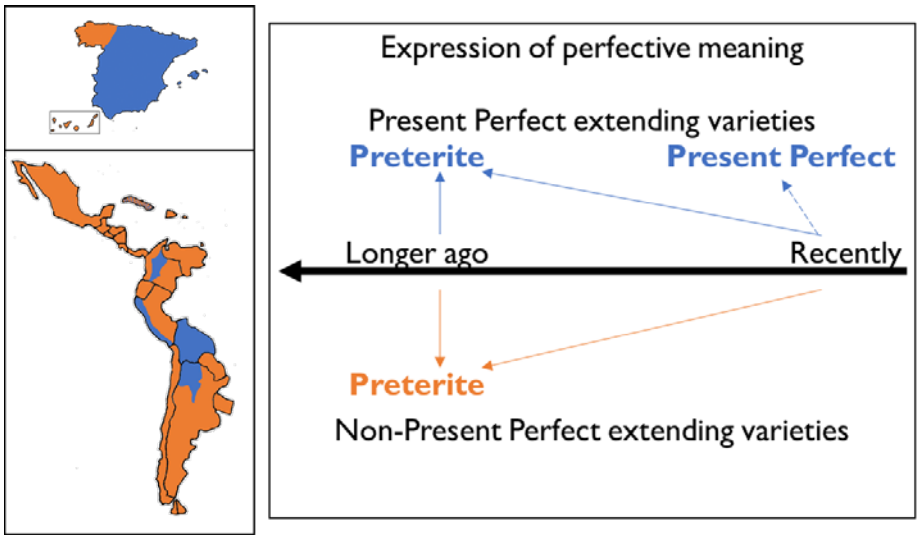


Figure 10: Regional variation in whether the Present Perfect can extend into perfective contexts. Areas in blue allow the extension, whereas areas in orange do not allow the extension

The relevance of this discussion is that Bybee (1994) and Schwenter and Torres Cacoullos (1994) have noted that language change often follows a pattern of the Present Perfect expanding from being a perfect marker to a constrained perfective marker to supplanting other forms. This has happened in the case of French and spoken Italian in parts of Italy. Silva-Corvalán (1994) notes that heritage speakers are often at the forefront of extending diachronic language change, and if this change is a universal preference, there is no reason why heritage speakers whose baseline allows the extension may not tread further along the 'perfect path'. Likewise, Silva-Corvalán notes that heritage speakers prefer to reduce the complexity of inflectional paradigms, and the complexity of associating both the Preterite and Present Perfect to sub-divided perfective meaning may lead heritage speakers to assign a uniform representation to the perfective (see also Polinsky & Scontras, 2020).

3.6 The acquisition of viewpoint aspect by heritage speakers under Revised Feature Reassembly: research questions and predictions

In Chapter 2, I elaborated upon the theoretical background of the Revised Feature Reassembly model of heritage language acquisition (Putnam & Sánchez, 2013). To recapitulate, under this account divergence of the heritage grammar from the baseline grammar obtains from reduced activation of the heritage grammar, resulting in reassembly of the formal features onto the forms associated with that meaning in the majority language, whether this only affects online production or the I-language representations themselves. In this chapter, I have shown that Arche (2006, 2014) provides a theoretical account of viewpoint aspect interpretations arising from a

constellation of features that vary in their expression cross-linguistically. As such, the acquisition task for heritage speakers of Spanish in the United Kingdom is to acquire the appropriate feature assemblies for both languages and to maintain the separate distinction through linguistic development until they reach linguistic maturity.

Crucially, the viewpoint aspectual interpretations are mapped onto morphological forms in different ways in English and Spanish. The English Simple Past is associated with perfective, continuous, and habitual meaning, whereas the Spanish Preterite is only associated with perfective meaning. Conversely, while the English Past Progressive and Spanish progressive forms are only associated with progressive meaning, the Spanish Imperfect is associated with continuous, habitual, and progressive meaning. These form-meaning associations are presented in diagrammatic form in Figure 11.

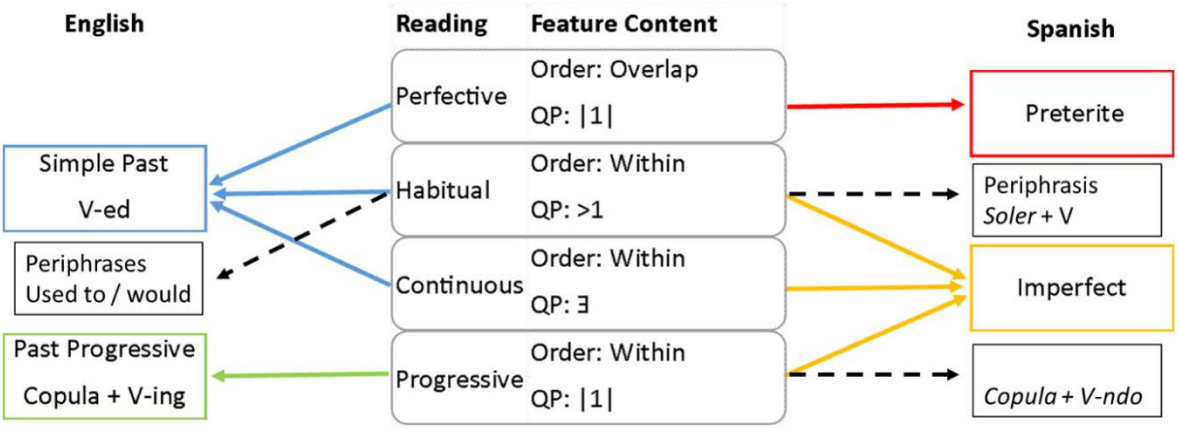


Figure 11: The semantic contents of past viewpoint aspectual readings in Arche's analysis, showing how the meanings map to forms in both English and Spanish. Adapted from Domínguez, Arche & Myles 2017: 437.

In Section 2.5.5, I established that two keys tests can be used to verify Putnam and Sánchez's model, in addition to whether specific divergence obtains where it would be predicted under the FRH (Lardiere, 2009). First, any divergence from the baseline in the heritage grammars should be associated with measures of language access. Second, divergence from the baseline should only be seen among older heritage speakers. I now apply these two conditions to the acquisition of viewpoint aspect by Spanish heritage speakers in the United Kingdom to yield key expected predictions associated with Revised Feature Reassembly (Putnam and Sánchez, 2013).

3.6.1 Research questions

In view of this model and the cross-linguistic differences in the expression of viewpoint aspect in Spanish and English, I address the following research questions in this thesis:

1. How are the features associated with viewpoint aspect assembled in the Spanish grammars of baseline speakers and heritage speakers in the United Kingdom?
2. In the case that the heritage speakers' assembly of viewpoint aspectual features diverges from the baseline grammar, how is this divergence manifested?
3. What is the role of the input and language access in the acquisition of viewpoint aspect in the heritage speakers' grammars? Specifically, to what extent are measures of language access better at predicting heritage speakers' accuracy than measures of language input?

3.6.2 Predictions

Under the FRH (Lardiere, 2009) and the Revised Feature Reassembly model, I would therefore predict that the habitual and continuous readings of imperfective viewpoint aspect will be the most difficult for the heritage speakers to associate with the Imperfect under influence from English. Since Putnam and Sánchez assume that divergence from the baseline will only happen after the initial stages of L1 acquisition have been completed, their model would also predict that younger heritage speakers will have less difficulty mapping habitual and continuous meaning to the Imperfect verb form than older children who may diverge.

Putnam and Sánchez argue that feature reassembly will take place when heritage speakers have lower levels of activation of the heritage language, and that this may not directly correspond to the amount of input they receive. As such, the model predicts that only heritage speakers with low levels of activation of Spanish will diverge from the form-meaning mappings of the baseline grammar. This is explicitly contra the Reduced Input account (e.g. Silva-Corvalán, 2003), under which a clear association between amount of exposure to Spanish and the assembly of the feature bundles onto the appropriate Spanish forms would be expected to obtain.

In either case, another potential source of unexpected form-meaning mappings in the heritage grammars would be if attrition has taken place in the baseline grammar. Coincidentally, Putnam, Perez-Cortes and Sánchez (2019) argue that the Revised Feature Reassembly model can be felicitously extended to L1 attrition, whether in online linguistic performance or at the level of I-language representations, and so we can reasonably predict that any attrition among baseline speakers would also manifest for the same readings.

3.7 Summary

In this chapter, I considered recent accounts of the linguistics of viewpoint aspect, and arrived at the position that it is best understood as a semantic universal that differs in its expression cross-linguistically in line with Arche (2006, 2014) and the predicate ordering approach. Unlike earlier

accounts, Arche deconstructs the notion of 'imperfective' aspect into several constituent interpretations, namely habitual, continuous, and progressive, each of which arises as a function of slightly different bundles of features. In Spanish, each of the three imperfective aspectual readings maps onto the Imperfect verb form, whilst perfective meaning is typically associated with the Preterite, although in some varieties the use of the Present Perfect is allowed in a limited number of perfective contexts. In English, the perfective, habitual and continuous meanings are associated with the Simple Past, and the progressive reading is associated with the Past Progressive form.

Consequently, the cross-linguistic differences in viewpoint aspect between English and Spanish make this grammatical property ideal for testing the predictions of both Lardiere's (2009) Feature Reassembly Hypothesis, and the Revised Feature Reassembly model proposed by Putnam and Sánchez (2013). In view of the tests for the suitability of the model I identified in Section 2.5.5, I established the research questions that guide the present study, and made predictions regarding the answers to these research questions in light of the Revised Feature Reassembly model. In the next chapter, I review the previous studies into viewpoint aspect in Spanish heritage speakers. To contextualise this literature more fully, I first consider the context of Spanish-English bilingualism, and also consider the wider acquisition literature on viewpoint aspect.

Chapter 4 Previous research on the acquisition of Spanish tense-aspect morphology and Spanish as a heritage language

4.1 Introduction

In this chapter, I review previous studies on the acquisition of viewpoint aspect morphology by Spanish heritage speakers. To support this, I also consider the sociolinguistic context of heritage language acquisition, as well as the broader picture of the acquisition of Spanish tense-aspect morphology in L1 and L2 acquisition. As will become clear through the review, most research on Spanish as a heritage language has been undertaken in the USA, and as such the studies on tense-aspect morphology in Spanish heritage speakers reflect this. Indeed, Polinsky (2016b: 325) asserts that "work on Spanish sets the standard for research on other heritage languages", and as such many of the studies reviewed here also represent seminally important contributions to the field of heritage language acquisition in general.

Although the term 'heritage speaker' is currently ubiquitous and serves as an undisputed label for the subset of bilinguals described in the introduction, the term only began to be used to refer to these bilingual populations in the late 1990s (e.g. Polinsky, 1997), and therefore studies from before this period never actually refer to 'heritage speakers'. Nonetheless, these studies are unequivocally about heritage speakers, and as such I both engage with these studies and use the term heritage speaker when discussing their findings despite the slight anachronistic nature of doing so.

The structure of this chapter is as follows. I begin with a brief overview of the broader context of the acquisition of Spanish as a heritage language in English-dominant contexts, incorporating sociolinguistic and linguistic findings from research on Spanish-English bilingualism in the USA and the UK. Following this, I review the literature describing viewpoint aspect in Spanish heritage speakers from a sociolinguistic and educational perspective, culminating in Silva-Corvalán's (1994) extensive description and analysis of tense-aspect morphology used across generations in Los Angeles Spanish. In the second half of the chapter, I pivot to focusing on the acquisition literature. In the first of these sections, I focus on the first language acquisition literature, including information about the effects of regional variation in viewpoint aspect. Following this, I focus on

the heritage language acquisition literature, beginning with research by Montrul and colleagues, and then considering the work of other scholars. Next, I review recent research into the acquisition of Spanish viewpoint aspect morphology by L2 learners. Finally, I summarise the findings that emerge from the review and highlight theoretical and empirical questions that remain to be investigated.

4.2 Spanish as a heritage language in English-dominant contexts

As an instance of language contact between the second and third most widely spoken languages in the world, Spanish-English bilingualism is a highly interesting phenomenon to research for a wide range of reasons (Velázquez, 2018: 2). Spanish and English have a long history of language contact at the individual level; Pozo-Gutiérrez (2005) and McIlwaine (2008) present evidence of both Spanish and Latin American communities in London during the 1700s. Since the beginning of the twentieth century, economic and political pressures have precipitated widespread migration to English-speaking countries, such as the USA and UK, from many Spanish-speaking countries, with a large number of these migrants ending up in low-skilled and low-paid employment (e.g. Estebanez, 1991; Pozo-Gutiérrez, 2005; Block, 2008 for the UK). Of course, such a generalisation constitutes an over-simplification of the situation, and a considerable number of migrants have secured high-skilled and high-paid professional employment in these contexts.

Nonetheless, in many migrant situations, Spanish is considered to have "low ethnolinguistic vitality" (Velázquez, 2018: 3); although the Spanish language is often maintained at the community level as new migrants join the speech community, the language is typically lost at the individual level in the second and subsequent generations due to a shift to English (e.g. Silva-Corvalán, 1994). In either case, the communities of L1 Spanish speakers in English language dominant social contexts have grown exponentially over the same period. Whilst homeland speakers of Spanish from and in these contexts are not exclusively monolingual, in the following sections exploring contextual research in the USA and UK, I refer to 'monolingual' or 'monolingual-like' varieties for ease of exposition.

4.2.1 Spanish in the United States of America

Montrul (2014: 177-178) notes that Spanish is spoken by approximately 16% of the total US population, with 'Hispanics' constituting the largest minority group in the country. Indeed, it is said that Spanish "axiomatically co-exists with English" in the USA (Pascual y Cabo and de la Rosa-Prada, 2016: 127), and whilst the USA is an English-majority country, it has the second highest number of Spanish speakers of any country in the world after Mexico (Pascual y Cabo, 2016: 1).

Whilst this is generally true, and especially true of southern states and major metropolises, less urbanised areas, particularly in northern and mid-western states, have a smaller degree of presence of Spanish (Velázquez, 2018). Since there has been such a large amount of Spanish-speaking migration to the USA in the past century, and the needs of businesses and services has involved nationwide visibility of Spanish language provision, which has made the Spanish language and Spanish speakers a primary target of 'English-only' movements (e.g. Valdés, 2000b; Otheguy, García & Roca, 2000), demonstrating that the picture for Spanish-speaking migrants and Spanish heritage speakers in the USA can be especially fraught and politicised. In this section, I begin by considering the context of Spanish as a heritage language in the United States, followed by a brief summary of formal linguistic research with Spanish heritage speakers.

Historically, many parts of the continental United States were colonized by Spanish speakers before English speakers; as such, there is a longer history of Spanish language use in these areas, even though the society is now English-dominant and assimilation to the English language is largely expected of Spanish speakers (Klee & Lynch, 2009: 195). The corollary of this is that whilst many empirical studies of Spanish heritage speakers in the USA present a situation that obtains from recent migration, Spanish has a far longer and more continuous history as a heritage language in the USA than typically reported, and the Spanish-speaking communities in the USA are consequently more complex than often assumed. In line with much of the work on Spanish heritage speakers in this context, in this dissertation I will focus on the more recent migrant communities due to the relevance of these communities for understanding language acquisition in heritage speakers; however, this is not without an appreciation that the underlying context is more complex than described here.

In a seminal volume examining different varieties of Spanish spoken throughout the United States, Lipski (2008) notes that there are substantial communities originating from various Spanish-speaking countries and territories across the Americas, of which most research has focused on speakers of Mexican, Puerto Rican and Cuban varieties of Spanish, examples of which I consider below. In addition to the vestigial Spanish-speaking communities from initial colonisation, Lipski provides a general chronicle of migration of Spanish speakers to the United States from across the Americas, in some cases due to worker shortages in the USA, but often following intense political unrest and revolutions in the countries of origin. Nonetheless, Lipski (2008: 5) observes that there is a tension in the place of Spanish in the United States, since although the Spanish-speaking and 'Hispanic' population of the country continues to grow, Spanish is often not retained by individuals in younger generations, with language shift to English within the family often taking place within two generations.

One consequence of the heterogeneous origins of the Spanish-speaking communities in the United States is that an observable process of dialect levelling has been observed, especially in cities with large Spanish-speaking communities. For example, Otheguy and Zentella (2012) extensively examine the pronoun production of Spanish speakers from varying countries of origin in New York and find that migrants from 'mainland' Latin America, where pronoun usage rates are comparatively low, become more Caribbean-like through the increased use of subject pronouns. This effect is prominent in individuals who have a high-degree of contact with Spanish speakers from outside their own speech community. Otheguy and Zentella also find strong evidence to suggest that contact with English also leads to increased pronoun use. This finding is echoed by Domínguez's (2013) examination of Cuban-origin Spanish speakers in Miami, whose increased use of subject pronouns compared to a monolingual Cuban baseline was indicative of influence of English.

A similar consequence of the highly heterogeneous population of L1 Spanish speakers in the USA is that individual families often include parents from two different Spanish-speaking countries, which can have a number of implications for questions of language and identity for their children (e.g. Potowski, 2008, 2011). Summarising two earlier studies of participants with Mexican and Puerto Rican parents in Chicago, Potowski (2011) highlighted that although some 'MexiRicans' were perceived as having phonologically mixed dialects, many 'MexiRicans' were perceived as speaking either Mexican or Puerto Rican Spanish, and that this perception usually aligned with the mother's variety of Spanish, even if the father was reported as speaking Spanish most at home. In one of the studies (Potowski, 2008), the 'MexiRican' participants also completed a lexical identification task using a list of English words for which the Spanish equivalent differs in the two varieties; the participants' choice of lexical item in each case was highly correlated with the phonological variety their speech most resembled.

The single largest group of Spanish speakers in the USA are of Mexican origin, constituting nearly three fifths of the total in 2000 (Lipski, 2008: 75), with especially large concentrations in California and Texas (p. 77). The large number of Mexican-origin speakers in the US reflects geographical proximity, and the fact that much of the southwest of the United States was originally part of Mexico, and before that colonial New Spain (Lipski, 2008: 78). Valdés (2000b: 102) notes that there is such a diversity of language experience within the Mexican American community that "it is impossible to conjecture about language strengths or weaknesses based on generation, age, schooling, period of residence in the United States, or any such criteria". Nonetheless, Valdés agrees that the general trend observed in the USA with other migrant groups of "acquiring English and slowly abandoning their mother tongue" is also characteristic of Mexican Americans (2000b: 103). As an example, in her seminal study of Los Angeles Spanish, where the majority of Spanish

speakers are of Mexican or Mexican American origin, Silva-Corvalán (1994) observed exactly this pattern across the three generations of speakers that she recorded. Silva-Corvalán also found clear evidence that some observed differences in the grammars of the later generation speakers were motivated by Spanish internal factors, in addition to changes due to contact from English.

Spanish speakers of Puerto Rican origin are the second most populous group in the United States, excluding the inhabitants of Puerto Rico itself, which is a U.S. territory (Lipski, 2008: 118). Throughout the history of Puerto Ricans in the United States, the majority have lived in New York; in 1940 nearly 90% of the 70,000 Puerto Ricans living in the US lived in New York, while by 1980 just under 40% of approximately 2 million Puerto Ricans lived in New York (Lipski, 2008: 121). Within New York, this population has been associated with high levels of poverty. Zentella (1997: 19) quotes census data showing that Puerto Rican families in 1980 typically earnt 40% of the average family in New York state, with almost 60% of New York Puerto Ricans living under the poverty line, compared to 13.4% of people across the state. Despite this marginalization, the substantial sustained presence of Puerto Ricans in New York has led to this group possessing a degree of influence within the city (Otheguy & Zentella, 2012). Like most Spanish-speaking groups in the USA, even in New York's *el Barrio,* the "cultural heartland" of Puerto Ricans in the continental US (Lipski, 2008: 121), there is widespread language shift from Spanish to English by the third generation (Zentella, 1997: 180). Nonetheless, Zentella (1997: 184) remarks that even among English dominant bilinguals, "code switching is the unmarked choice".

The third largest group of Spanish speakers in the USA are Cuban Americans (Lipski, 2008: 98), who have been characterised as "a highly successful group relative to other Latinos" (Otheguy, García & Roca, 2000: 172). Although there had been sustained migration from Cuba beforehand, several hundred thousand Cuban refugees arrived in the USA following the 1959 revolution, with more than 100,000 refugees arriving in a six month period in 1980 (Lipski, 2008: 105-106). Over half of Cuban Americans live in one city: Miami, a "bilingual and bicultural county, where Spanish language is considered the second official language" (Castro, 1992: 173). Otheguy, García and Roca (2000: 177) note that intergenerational maintenance of Spanish is normal amongst Cuban Americans, partially resulting from the unique bilingual context of Miami, whereas other groups of Spanish-speaking migrants are more likely to assimilate to monolingualism in English by the third generation.This brief overview of three different contexts provides evidence that the situation of Spanish heritage speakers within different national groupings can contribute to the maintenance of the heritage language across generations.

As 'Hispanics' constitute the largest minority group in the USA, there has been sustained interest in the formal nature of the grammars of Spanish heritage speakers in recent years. Montrul (2012:

108) states that “Spanish heritage speakers display significant gaps in their grammatical development, and these gaps are typically interpreted as being the result of incomplete acquisition.” Collective findings from Montrul’s previous work indicate that similarly to L2 learners, heritage speakers show “variability and instability with gender agreement, tense, aspect and mood morphology” (2012: 109), although one major difference with L2ers is that heritage speakers tend to perform better on production tasks and less well on metalinguistic tests (2012: 109-110). As such, Montrul (2012) provides a summary of heritage speakers of Spanish highlighting the fact that parts of their linguistic knowledge differs from those of other L1 Spanish speakers and also from L2 speakers.

Pascual y Cabo (2015: 391) notes that “morphosyntax seems to be especially vulnerable to cross-linguistic influence” in heritage bilinguals, and that this is true of Spanish heritage speakers too. Pascual y Cabo focuses on three key areas of morphosyntax in which English and Spanish differ, differential object marking (DOM), dative-experiencer verbs, and the tense-aspect system. DOM is a Spanish construction in which specific and animate direct object arguments are preceded by ‘a’ whereas all non-specific direct object arguments are unmarked. As such, the grammar differentially marks the objects according to whether these features are present in the functional projection of the determiner phrase. Whilst this is an early-acquired feature of L1 Spanish, DOM is frequently omitted by heritage speaker populations in the USA (p. 392). Dative-experiencer predicates are another area in which Spanish differs from English. For these verbs, such as gustar, the canonical sentence structure is OVS. The object is in the dative case and represents the experiencer thematic role. As a dative, it minimally requires the dative clitic and, optionally, the full expression of the argument fronted by the dative marker ‘a’ before the clitic. Pascual y Cabo (2015: 393) discusses a variety of studies which show that gustar-type verbs have undergone structural reanalysis in the heritage speaker grammars. Finally, surveys of the distinction between Preterite and Imperfect past tense contexts show that Spanish heritage speakers show a preference for the Preterite over the Imperfect (Pascual y Cabo, 2015: 394), an area that will be re-examined in more detail throughout this dissertation.

Montrul (2018b) provides the most wide-ranging overview of the grammatical competence of Spanish heritage speakers carried out to date. She considers evidence of heritage speaker competence in morphological, syntactic, and semantic-pragmatic domains. Summarising previous research, she notes that complex syntactic structures and object clitics appear to be resilient, that the semantics of interrogatives and determiners are vulnerable, whereas the constraints on subject pronouns are vulnerable at a pragmatic level, even though the appropriate options remain in the heritage speaker grammars. Conversely, there is a divide in the morphological competence of heritage speakers, with the expression of features in the nominal domain appearing to be more

vulnerable than those in the verbal domain. One exception to this is the case of verbal mood which Montrul categorises as “very vulnerable” (2018b: 159).

In sum, this short review of previous reviews demonstrates that some areas of the grammatical competence of Spanish heritage speakers in the United States are vulnerable in this situation of bilingualism. These reviews corroborate the changes documented in the sociolinguistics literature as a result of contact between Spanish and English, and suggest that psycholinguistic factors at the individual level are involved in the maintenance or loss of certain features at an individual level in addition to the community level.

4.2.2 Spanish in the United Kingdom

Spanish speakers, from both Latin America and Europe, constitute a “small, invisible, under-researched and largely ignored minority group” in the UK (Guardado, 2018: 537). As such, the research literature on Spanish-English bilinguals in this country is far smaller than that of its US counterpart. Even so, UK-wide statistics suggest that there are approximately one million people in the UK whose L1 is Spanish (Foreign and Commonwealth Office, 2007), around 1.5% of the total population, although this number is very difficult to verify at all. Block (2008) estimates the number of Spanish speakers of Latin American origin in London alone to be approximately 300,000, whereas Domínguez (2013) provides a much more conservative estimate. More recently, Paffey (2019a, 2019b) reports that approximately 120,000 Spanish speakers reside in the UK, of which 72,000 are in London.

In either case, there is a substantial, albeit small, population of Spanish speakers in the UK, with a relatively large number of these speakers clustered in London. In this section, I will first present a summary of sociolinguistic explorations into the presence of these Spanish speakers in the UK. This is followed by a more complete overview of the research on the linguistic characteristics of bilinguals in the UK context, covering both L1 attriters and early bilinguals raised here. In spite of the historically ‘invisible’ situation of Spanish speakers in the United Kingdom, there is a current trend within sociolinguistic research to document and explore the presence of Spanish speakers in the UK (e.g. Pozo-Gutierrez, 2003), with a particular focus on the situation of the Spanish-speaking communities in London (e.g. Block, 2008; Paffey, 2019a, 2019b).

Taking a sociolinguistic perspective, Kelsall (2015) investigated language use and community belonging amongst different generations in London. Of relevance to the current study, she found that Latin American children in London preferred to use English to Spanish, and made frequent use of code-mixing strategies. Even so, Kelsall concluded that the Spanish language was considered to be an essential component of ‘latinidad’ in London. Tyrell, Guijarro-Fuentes and

Blandon (2014) have also conducted a study looking into the patterns of language use amongst different generations of Spanish-speakers in the UK, finding that whilst adults in families typically considered the home to be a Spanish-speaking environment within the English-dominant society, the children were more likely to see the home as a mixed-language environment.

Considering the case of migrants from Spain to the South of England during the Franco period, Pozo-Gutiérrez (2006) notes that many of the migrants in her study underwent a language shift to English, having perceived that assimilation to the wider English society would be more beneficial, and in many cases especially once they had had children. As such, many of her interviewees had significantly attrited in Spanish, with one participant's Spanish described as "a fossilized language that she clumsily articulates" (Pozo-Gutiérrez, 2006: 215). In sum, Pozo-Gutiérrez paints a picture of a Spanish migrant community who have assimilated to their host country, and who have not maintained their L1 at an individual or community level. Consequently, this lack of Spanish maintenance is also observed in the children of these migrants as well, very few of whom attained a fluent proficiency in Spanish (Pozo-Gutiérrez, 2006: 228).

There is very little evidence that the lack of Spanish language maintenance in the second generation has changed, despite the existence of Spanish and Latin American schools, in London and elsewhere in the country. Anecdotally, many of the children who are initially raised bilingually not only become dominant in English, much like heritage speakers in the USA or the children interview by Kelsall (2015) and Tyrell, Guijarro-Fuentes and Blandon (2014) but also completely reject their Spanish language heritage during early childhood. Silva-Corvalán (2014) observed similar behaviour for one of her grandsons, who went through a period of total rejection of Spanish, overcome by parental and grandparental persistence and a well-timed decision to visit family in Chile. Nonetheless, not all parents succeed in transmitting their L1 to their children, as in the case of some of the migrants discussed by Pozo-Gutiérrez (2006), and these individuals will be invisible to most studies on bilingualism.

In comparison to the growing literature on the sociolinguistic situation of Spanish speakers, especially in London, there is a general paucity of investigations into the formal linguistic nature of the grammars of first- and second-generation Spanish-speakers in the UK (Guardado, 2018: 551). In an influential case study, Deuchar and Quay (2000) examined the bilingual development of 'M' from 0;10 until 2;3, investigating whether she had a unified grammar for both languages or dual systems at this early age. Whilst an excellent and exciting case study for a variety of reasons, not least the demonstration that 'M' does indeed distinguish her two grammars from a very early age, the emphasis throughout the case study is on phonological and lexical development and language choice in different situations, with less discussion of formal morphological and syntactic

features. In view of this, we will not consider the implications of this case study for our understanding of the linguistic systems of Spanish-English bilinguals in the UK, and instead focus on the small number of experimental studies that have been conducted with bilingual populations at older ages.

Guijarro-Fuentes and Marinis (2011) investigated the use of Spanish DOM by 44 children, aged between 10 and 14 years old, in London, compared to 10 monolingual children of similar ages in Spain. The children had to complete a sentence completion task with six conditions in which the use of 'a' with a direct object was either obligatory or ungrammatical. In general, the results indicated that the bilingual children were less accurate than the monolingual children, although the pattern of performance across conditions was strikingly similar for both groups (Guijarro-Fuentes & Marinis, 2011: 239). Guijarro-Fuentes, Pires and Nediger (2017) conducted a further study of DOM in younger Spanish-English bilinguals in the UK, administering an acceptability judgment task (AJT) in addition to the completion task used by Guijarro-Fuentes and Marinis (2011). The results of the AJT demonstrate that there is a mismatch between the production and competence of the DOM 'a' for the bilinguals, with no significant difference found between the bilingual and monolingual children in this task. These two studies on DOM in UK-acquired L1 Spanish further demonstrate that there is protracted non-convergence on target-like norms into late teenage years in monolingual contexts. As such, it is difficult to ascertain whether the results of the bilingual groups represent a standard acquisitional pathway, if slightly delayed, or the innovation of a new grammatical variety that departs from the input norms for this property.

Cazzoli-Goeta and Young-Scholten (2011) investigated the use of non-nominatives in sentence initial positions by 24 L1 Spanish speakers living in the UK, all of whom grew up in Spanish-dominant contexts. In Spanish, certain constructions and verb types require non-nominative arguments in the left-edge of the clause with the subject argument in a post-verbal position, whereas this option is not grammatical in English. Controlling for amount of Spanish use and English contact amongst their participants, Cazzoli-Goeta and Young-Scholten (2011: 221-222) observed a general tendency to non-monolingual-like pragmatics in the use of non-nominatives across all of the bilinguals, with those who used English most demonstrating an across-the-board effect suggesting that their L1 grammar was undergoing reassembly in line with the L2 grammar. This grammatical attrition is an interesting finding by itself, but Cazzoli-Goeta and Young-Scholten argue that the since the majority of these attriters are not in a sizeable enough community to maintain Spanish in the second generation, this individual-level attrition will not be intergenerationally transmitted and therefore will not be a linguistic characteristic of the variety used by the younger generation.

Domínguez (2013) focused on null and post-verbal subject use of L1 Spanish speakers who were long-term migrants to English countries, contrasting bilingual groups in Miami and the UK. Crucially, English and Spanish differ with respect to this property, and there are also substantial differences between some varieties of Spanish. Whilst the participants in Miami were immersed in a bilingual community with multiple dialects of Spanish, the migrants to the UK were generally individual bilinguals within the wider British society; the results show that whilst the null subject use changed in the bilinguals in Miami, this change was not found in the UK bilinguals (Domínguez, 2013: 180-182). In combination with the results reported by Cazzoli-Goeta and Young-Scholten (2011), this raises questions as to the role played by the community dimension in bilingualism. Specifically, exposure to a levelled or innovative variety at the community level could lead to restructuring of the migrants' L1, something that cannot happen when there is no bilingual community speaking a different variety to learn.

4.2.3 Summary and comparison of the two contexts

The examination of literature on Spanish in the USA and the UK has revealed clear contrasts between the two English-dominant societies. In the USA, the Spanish language and Spanish speakers are highly visible, whereas both the language and its speakers have been historically invisible in the United Kingdom. Consequently, the emergence of contact varieties of Spanish in the USA, as widely documented by sociolinguists such as Silva-Corvalán (1994) in Los Angeles, is widely expected (see also Lipski, 2008). Conversely, it has been argued that the relative invisibility of Spanish speakers in the United Kingdom has resulted in contact varieties not being established and used at a community level, even though individual bilinguals exhibit grammatical attrition (Cazzoli-Goeta & Young-Scholten, 2011).

This difference has implications for the expected outcomes of heritage language acquisition of Spanish in the two contexts. If Spanish-speaking children in the United Kingdom are not exposed to a community-level contact variety, the input quality is largely going to be determined by the parental generation, although this does not preclude other sources of input being present in the cases of some children. Equally, if the amount of Spanish input outside the home context is much smaller than for heritage speakers in the USA, the input quantity for the heritage language is likely to be reduced as well, and likewise opportunities to activate and access the Spanish grammar. In sum, the quality may or may not be different from monolingual-type varieties of Spanish on a family-by-family basis, and the input quantity and language access will likely be highly dependent on the language balance in the home context.

It has been claimed that European studies on bilingualism have often focused on elite bilinguals rather than stigmatised bilingual communities, such as Hispanics in the USA, which may be an explanatory factor in observed differences between bilingual populations in the two contexts (Kupisch & Rothman, 2018). The UK presents an unknown quantity here, since despite being geographically European, Pozo-Gutiérrez's (2006) investigations demonstrate that it is a linguistically assimilationist context, more like the USA, contra Guijarro-Fuentes and Marinis (2011) claim that there would be a beneficial effect of positive attitudes. Domínguez (2013) and Cazzoli-Goeta and Young-Scholten's (2011) work on attrition in Spanish speakers in the UK context lends credence to Guardado's (2018) suggestion that the UK represents an interestingly different context of Spanish-English bilingualism compared to the USA, where the bilingual community is much larger.

In sum, it is clear that there are substantial differences between the contexts for Spanish-English bilingualism in the USA and UK, which may lead the grammatical outcomes for heritage speakers in the two contexts to differ as well. Viewpoint aspect in Spanish heritage speakers' grammars has thus far only been researched in the USA, and the contribution of data from this research project in the UK is of immense value in helping us to understand the relationship between the wider social context and the outcomes of heritage language acquisition.

4.3 Descriptive studies of viewpoint aspect in Spanish heritage speakers

Merino (1983) used a cross-sectional design to investigate the linguistic capabilities of bilingual children in the first five years of English-language schools in California, using a series of production and comprehension tests to assess their proficiency across a range of linguistic properties in both languages. Her battery included a category of 'tense' for which regular and irregular Preterite verb forms and Imperfect verb forms were tested. The comprehension data was collected using a picture-selection task, and the production data was collected using a 'delayed imitation' task in which the children saw two pictures that were described by the researcher in turn, and then asked to repeat the researcher's description for each image.

For the production task, across three items the Kindergarten group (ages 5-6) were slightly more accurate with Spanish verb forms than English verb forms while the first grade group (ages 6-7) were equally accurate with both morphemes (and performed at ceiling, but Merino suggests this is an artefact of the group size and membership [Merino, 1983: 284]). Additionally, the second grade group (ages 7-8) were also slightly more accurate in Spanish than in English, whereas the third grade group (ages 8-9) were slightly more accurate in English than in Spanish. Finally, the fourth graders (ages 9-10) were marginally more accurate in English than in Spanish. Merino

(1983: 286) interpreted this drop in proficiency with the past tense as evidence that “loss may be taking hold” in the children’s grammars as they get older.

The comprehension data shows a slightly different picture (Merino, 1983: 287), however, with the Kindergarten children substantially better at English than Spanish, and the first graders equally good with both languages. The second grade pupils were generally better with Spanish verb forms than English verb forms, whilst the third graders were slightly better with English and the fourth graders slightly better with Spanish.

Merino then followed up her initial data collection with a second administration of the test instruments two years later, with a slightly smaller group of children. The overall picture showed that accuracy in English increased for all groups across the board, whereas accuracy in Spanish fell for almost all of the groups with the exception of the second graders, who recorded a slight increase (p. 289). Performance with the past tense aspectual morphemes decreased for every case, suggesting that the attrition commonly took place with these verb forms.

Merino also conducted an analysis of which factors of personal history and language use most influenced the attrition observed in Spanish. She observed that “children who tended to use both languages with the majority of their relatives and friends demonstrated the greatest loss” (Merino, 1983: 291). Merino’s conclusions provide an important window into the effects of bilingualism on the heritage language; whereas English abilities increased for all of the children in the study, nearly all of the children underwent a degree of attrition in Spanish, and uniformly so in the case of past tense verb forms.

Turning to a sociolinguistic description of Spanish heritage speakers’ aspectual distinctions, we consider Zentella’s (1997) description of bilinguals of Puerto Rican origin in New York next. Pousada and Poplack (1979: 232) had found “overwhelming stability in the systems of tense, mood and aspect in the PR Spanish spoken in the United States” for 12 individuals born in Puerto Rico, and Torres (1989) showed that the subjunctive was maintained across generations for children who had spent a substantial amount of their childhoods in Puerto Rico. However, Zentella’s participants, who had all been born in New York and spent very little time in Puerto Rico, demonstrated some non-standard use of verb forms in past aspectual distinctions. Whilst all five participants correctly used the Imperfect verb form, four of them extended the Imperfect into contexts that would typically require a Preterite verb form (p. 186-187).

In her seminal study of language variation and change amongst Spanish speakers in Los Angeles, Silva-Corvalán (1994: 9) reports that over 70 per cent of the population in some districts of the city was of Hispanic origin, including East Los Angeles where she conducted her fieldwork. To put

that in context, in a city population of approximately 7.5 million residents in 1980, over 2 million of these were Hispanic, with this population group highly concentrated in the Eastern districts of the city centre, and 80 per cent of this group was of Mexican origin (pp. 7-9). Whilst the Spanish language was maintained at the community level through the constant arrival of new migrants into the speech community, there was also widespread language shift to English in the second generation, especially for younger children in a family. Consequently, the Spanish language norms of these younger children are "characterized by a greater difference from the norms of first-generation immigrants" than that of the oldest sibling in the family (p. 10). By the third generation, children may be exposed to Spanish and develop receptive skills in the language, but often do not have communicative fluency, being functionally reliant on English (p. 11).

Silva-Corvalán recorded 50 Mexican-American bilinguals living in Los Angeles, divided into three groups based on type of bilingual rather than proficiency level in Spanish (p. 15). The first group comprised individuals who were born in Mexico and migrated to the USA after age 11, and had been resident in the USA for at least five years (p. 15). The second group were either born in the USA to a speaker who would qualify for the first group, or they were born in Mexico but migrated to the USA before age 6 (p. 16). The third group were all born in the USA, with the requirement being that they had a parent who would qualify for the second group, or who had grown up in a rural Spanish-speaking community in certain parts of the USA (p. 16). There were 16 individuals in the first group, 16 in the second group, and 18 in the third group. Whilst each group included participants from across the age continuum from late adolescents to older individuals, at no point does she explicitly state the age range of the study or the individual ages of participants, even in her detailed appendices.

Silva-Corvalán collected her data using a "careful sociolinguistic fieldwork methodology", in which she collected data from individuals in each group of her study that was as naturalistic as possible, but still provided samples from a wide variety of discourse genres and topics (p. 18). This wide-ranging naturalistic methodology gave every participant the opportunity to use every expected verb form found in monolingual varieties of Spanish. Silva-Corvalán also administered a 'non-spontaneous' gap-fill task focused on verbal morphology distinctions (p. 33), although she did not include any comprehension data, which means that the question as to whether a non-attested form is maintained in an individual's internal grammatical representations or not remains open.

From a rich inventory of 21 simple and compound forms in monolingual varieties of Spanish (p. 21), Silva-Corvalán identifies a number of divergences between this canonical verb system and both the most Spanish-dominant bilinguals in the first group, and the more English-dominant bilinguals in the second and third groups. Whilst the first generation group maintains the

aspectual distinction between Perfective and Imperfective past tense verb forms in Spanish, most of the speakers in the subsequent groups are characterised by extending the Perfective verb form into contexts where the Imperfective should be used, and exclusively using the Imperfective verb form with a closed list of verbs (pp. 44-45). With respect to the distinction between Preterite and Imperfect verb forms, Zentella (1997) found somewhat similar behaviour in Puerto Rican background bilinguals in New York, although this group characteristically maintained the Imperfect form and were seen to find production of the Preterite form more difficult. Similar to Silva-Corvalán's appeal to internally-motivated change documented below, Zentella argues that the behaviour of the bilinguals in her documentation arises from patterns of language use in Puerto Rico (1997: 190-197), although she does not explicitly discuss the Preterite-Imperfect distinction in this section and why the Puerto Rican bilinguals over-extended the use of the Imperfect in this way.

4.4 L1 acquisition of Spanish viewpoint aspect

In general, research on the acquisition of verbal morphology in monolingual Spanish-speaking children shows that the Preterite verb form is used early, from shortly after age 1 and productively before age 2, with Imperfect verb forms starting to appear shortly after 2 and productively by age 3 (Montrul, 2004: 122). In spite of this early acquisition of the morphological forms, children in monolingual contexts nonetheless continue to use them and understand the distinction in non-adult-like ways (García del Real Marco, 2015: 245).

Hodgson (2003, 2005) compared Spanish-speaking children in Barcelona across three groups at ages 3-4, 5-6 and 7-8 in their production and comprehension of the Preterite and Imperfect forms. In a production task, children were required to narrate what they had seen in a silent video clip. For the first comprehension task, the children completed a sentence-picture matching task, in which after a video context they were asked a question with either perfective or imperfective morphology, and asked to choose which of two pictures, one presenting a situation in progress and the other presenting a completed situation. In the second comprehension task, they completed a similar activity following a live-acted conversation with puppets.

Hodgson's results in the production task (2005: 132-134) show that 3-4 year olds performed slightly above a target of 75% use of Imperfect and related verb forms in atelic contexts, but slightly below this target in using Preterite and Perfect verb forms in telic contexts. The 5-6 year olds performed significantly below target for using perfective verb forms in telic contexts and somewhat above target in using imperfective verb forms in atelic contexts. The 7-8 year olds performed above target in both telic and atelic contexts. Hodgson's comprehension results (2005:

134-140) paint a slightly more complex picture. The 3-4 year olds perform quite low across both tasks and conditions. The 5-6 year olds generally perform near ceiling in their comprehension of the Preterite verb form, but exhibit greater uncertainty with the comprehension of the Imperfect verb form. The 7-8 year olds generally perform near ceiling across all conditions. Hodgson interpreted these results as suggesting that children younger than five do not distinguish the two morphological forms, even though they produce them from a much earlier age. Even so, the continued difficulty with interpreting the Imperfect by the 5-6 year olds suggests that the full semantic interpretation of the Preterite-Imperfect distinction may not be grammaticalised until slightly later than five years old.

García del Real Marco (2015) carried out a battery of activities to assess 5 year old Spanish-speaking children's comprehension and production of tense and viewpoint aspect. For the production and comprehension of tense, 41 children and 20 adults completed a sentence-to-scene matching task and a sentence completion task, which both used the same video narratives in which a character performed an atelic action at three separate points. In the comprehension task, the adults consistently matched present, past and future verb forms to present, past and future contexts, but the five year olds showed greater variability with which forms they associated with which contexts, particularly allowing the present verb form to refer to any of the contexts. In the production task, both adults and children correctly used appropriately tensed verb forms in the different tense contexts, although the precise verb forms used by the participants at different ages were different.

The remainder of activities in García del Real Marco's study were focused on the perfective-imperfective distinction of Spanish. The first of these targeted children's comprehension of imperfective aspect, specifically to see whether difficulty in using the Imperfect verb form with telic verbs reflects a semantic, discourse-based or agent-intention difference between the children's and adults' grammars. García del Real Marco deployed a picture selection task in which, either following a narrative or out of the blue, the five years were required to choose a picture that showed either a complete, ongoing or incomplete situation on the basis of a test sentence that contained either a Preterite or Imperfect verb form. Where the adults in the study preferentially, although not exclusively, associated the Preterite verb form with complete pictures and the Imperfect verb form with ongoing pictures, the children had greater variability in which verb form they associated with which picture, especially for the Imperfect. The results showed that the narrative contexts were where the children had difficulty, suggesting that the semantic entailments of imperfective morphology were not problematic, but rather the children had difficulty in linking the imperfective forms to the discourse context.

García del Real Marco's next experiment focused on whether the five year old children comprehended the Imperfective Paradox, in which perfective verb forms entail completion for telic verbs, but imperfective verb forms do not. In order to do this, she employed a truth value judgment task and a production task. The results of the study show that the children correctly accepted the Imperfect verb form in both complete and incomplete situations, and correctly accepted the Preterite verb form in complete contexts whilst rejecting it in incomplete situations. However, the production results show that when a specific reference time is included in the stimulus, the children tend to overproduce the Imperfect verb form (García del Real Marco, 2015: 219-220).

Recall from Section 3.5 that there is substantial regional variation in the Spanish-speaking world with regard to whether the Present Perfect can be used in a sub-set of perfective contexts. Markle LaMontagne and Cuervo (2015) examined a longitudinal corpus of spontaneous data from two Peninsular Spanish children until shortly before they were 4;0. The Present Perfect emerged before the Preterite for these children, and it appeared that they were using it to express past without the referential constraints on its use present in adult use. By way of contrast, Markle LaMontagne and Pérez-Lerouz (2016) conducted an elicitation study with 17 Mexican children, and found that whilst they were highly proficient in using the Preterite, they used the Present in contexts that the Present Perfect would be required. Thus, there is a clear effect of regional variation in the acquisition order and use of the different forms.

In sum, the evidence from monolingual children's production and comprehension of Spanish past tense aspectual forms shows that the verb forms are produced from a very young age, with the semantic and pragmatic entailments of each form then stabilising around the age of five. This is also the age at which Montrul (2018a) hypothesises that dominance from the social majority language will increase, and as such this may explain why viewpoint aspect has consistently been found to be vulnerable in heritage speakers' grammars, namely that the forms are present in their repertoire but the associated semantics never stabilised.

4.5 HL acquisition of Spanish viewpoint aspect in English-dominant contexts

In this section, I review research that has directly examined the acquisition of past viewpoint aspect morphology, the Preterite-Imperfect contrast, by Spanish heritage speakers in English-dominant contexts. As such, the work reviewed here has exclusively taken place in the context of the United States. Markle LaMontagne (2016) studied the acquisition of the Preterite and Present

Perfect by Latin American origin heritage speakers in a French-dominant context in Canada, but due to the difference in context and dominant language, I do not consider this study here.

4.5.1 Work by Montrul and colleagues

Whilst prior generative research on bilingualism had focused on very young children, due to the generative assumption that children would successfully acquire the language they were exposed to (Genesee, 2000), Montrul (2002) represents one of the first studies within this paradigm to investigate the linguistic outcomes in the grammar of heritage speakers with what could be considered an end-state grammar. Montrul investigated the Spanish Preterite-Imperfect aspectual contrast in adult bilinguals whose linguistic background she describes as follows:

> [T]hese individuals had been exposed to Spanish and English from birth and early in childhood. Although they speak the two languages as adults, many feel more comfortable using English, and appear to have failed to acquire full competence in Spanish.
>
> **Montrul, 2002: 39.**

Indeed, Montrul characterises many of the bilinguals in her study as being similar to second language learners; as such, regardless of the pathway to this divergence, Montrul holds that these individuals are an example of 'incomplete acquisition' in bilingualism (p. 39). However, since timing of age of onset of bilingualism has been theoretically argued and empirically shown to affect children's outcomes (see section 1.2), Montrul subdivides these speakers according to age of onset of English, yielding two groups of early bilinguals (p. 46): 'simultaneous' (before age 3) and 'early child L2' (between ages 4 and 7). She includes an additional group of adult bilinguals in her study who migrated to the USA before puberty but "after they had already acquired full competence in Spanish" (p. 40), between the ages of 8 and 12 (p. 46).

As such, Montrul had three experimental groups of bilingual participants in her study (p. 47): simultaneous bilinguals (n = 16), early child L2 learners (n = 15), and late child L2 learners (n = 8). In addition, there was a control group of 'monolingual' Spanish speakers (n = 20), who had all grown up monolingually in Spanish-speaking countries but had been resident in the USA for between six months and four years at the time of testing (p. 46).

There were four experimental tasks completed by the participants in the study. First, a written morphology recognition task, in which participants were given a short narrative and required to fill in 30 blanks with the appropriate aspectual choice (p. 48). Second, an oral narrative retelling task in which the participants were prompted with images corresponding to the Little Red Riding

Hood fairy tale (p. 48). Both the morphology recognition task and oral narrative retelling task accessed learners' production accuracy with the aspectual morphology in narrative contexts. Third, the participants completed a sentence conjunction judgment task, in which they rated sentences on a scale of -2 to +2 as to whether a pair of coordinated clauses was logical based on the use of Imperfect or Preterite morphology in the first clause related to boundedness entailments of the Preterite and Imperfect morphology (p. 51). Finally, the participants also completed a truth value judgment task, which targeted their knowledge of 'other meanings associated with the Preterite/Imperfect contrast'. This included verbs whose interpretation differs according to viewpoint aspect morphology (e.g. saber 'to know' is interpreted as an achievement with perfective morphology (ella) supo 'she found out', and as a stative with imperfective morphology (ella) sabía 'she knew'), the habitual reading of the Imperfect, and differing interpretations of genericity and specificity depending on the morpheme (p. 52).

Across all of these tasks, the results demonstrated a high degree of variation in the bilingual groups, with the participants' age at onset of bilingualism correlating with the monolingual-likeness of the bilinguals' ultimate attainment (p. 57). The viewpoint aspectual system diverged from the monolingual-type Spanish grammar in two main respects. Most characteristically, the Preterite forms of stative verbs were largely non-existent in the heritage speaker grammars, both the simultaneous and sequential bilinguals as well as the bilinguals who arrived in late childhood. To a smaller degree, Imperfect forms of achievement verbs are also affected.

Montrul (2009) tested heritage speakers' knowledge of both viewpoint aspect and subjunctive mood, showing that viewpoint aspect was better retained than the subjunctive. There were 65 heritage speakers across three proficiency groups, 29 advanced, 21 intermediate, and 15 low proficiency, and a control group of 23 monolingually raised native speakers. For the aspect-focused part of the study, Montrul used the same methodology as in her 2002 study: oral narrative retelling of Little Red Riding Hood, written morphology recognition requiring a forced choice of the Preterite or Imperfect verb form in a narrative context, and a shortened version of the sentence conjunction judgment task.

In the oral production task, 7 of the low proficiency, 4 of the intermediate and 9 of the advanced heritage speakers produced some errors. There were 21 examples of the Preterite being used in imperfective contexts, and 19 examples of the Imperfect being used in perfective contexts. The Preterite was over-used in 1.8% of all contexts in which it was used, and the Imperfect was overused in 3.8% of all contexts in which it was used.

The written morphology recognition task showed clear differences between the groups; where the monolingually-raised native speakers had a mean accuracy rate of 96.4% for the Preterite and

95.9% for the Imperfect, the advanced heritage speakers had rates of 92.6% for the Preterite and 85.2% for the Imperfect. Likewise, the intermediate heritage speakers had an accuracy rate of 92.2% for the Preterite and 69.9% for the Imperfect, and the low proficiency heritage speakers' accuracy was 82.3% for the Preterite and 60.4% for the Imperfect (p. 252). Two-way Analysis of Variance (ANOVA) showed that accuracy with the Imperfect was significantly lower than for the Preterite, and that the groups were significantly different from one another, with an interaction between the two variables being highly significant as well.

In the sentence conjunction judgment task, all groups rated the Preterite and Imperfect verb forms differently, although the lower and intermediate proficiency groups generally only weakly rejected the Preterite form, and all three groups gave substantially lower acceptance ratings to the Imperfect verb forms. Montrul further tested whether there was an association between lexical aspect and the heritage speakers' ratings of the verb forms[11], showing that whilst all groups distinguished between the verb forms the low proficiency groups rejected both verb forms with achievement predicates in the imperfective contexts tested, and least strongly rejected the Preterite verb form with stative predicates.

Montrul argues that these results demonstrate that heritage speakers of Spanish know the Preterite-Imperfect contrast (2009: 256). Montrul also notes that errors affect the Imperfect verb form more than the Preterite verb form. Furthermore, in comparison to their performance in the mood studies, Montrul concluded that "the same speakers appear to have better command of grammatical aspect" (2009: 265), and argues that this is related to the fact that viewpoint aspect is mastered at a younger age, whereas the subjunctive mood is not mastered until substantially later.

Montrul and Perpiñan (2011) also conducted a study that investigated viewpoint aspect in the grammars of Spanish heritage speakers in the USA, in this case comparing 60 heritage speakers and 60 second language learners, with 23 monolingually raised native speakers as a control group. Like Montrul (2009), this study focused on the Preterite-Imperfect aspectual contrast and the Indicative-Subjunctive mood contrast, of which only the first contrast will be reported here. The participants completed the written morphology recognition task, which was used to assess their

[11] At the time, the Lexical Aspect Hypothesis (e.g. Andersen & Shirai, 1996) was influential in the L2 acquisition literature. Viewpoint aspect and to a lesser extent lexical aspect are more clearly defined in Chapter 4. The immediate relevant point here is that Vendler (1967) classified verbs into four classes of lexical aspect—states, activities, accomplishments, and achievements—on the basis of dynamicity, durativity, and telicity. The Imperfect is generally used more often with stative and activity verbs, whereas the Preterite is more generally used with accomplishment and achievement verbs, and this is reflected in the initial order of acquisition.

production, and a sentence conjunction judgment task, which was used to assess their comprehension.

In the morphology recognition task, the control group's mean accuracy was 95.9% for the Preterite and 96.5% for the Imperfect. The heritage speakers were divided into three groups; the advanced group's (n = 23) accuracy was 90.3% for the Preterite and 84.2% for the Imperfect; the intermediate group's (n = 21) accuracy was 92.2% and 69.9%; and the low proficiency group's (n = 16) accuracy was 83.5% and 61.3% (Montrul & Perpiñan, 2011: 108). The L2 learners, in equally sized sub-groups, had the following accuracy rates: advanced, 95.6% Preterite and 95.4% Imperfect; intermediate, 86.7% Preterite and 85.7% Imperfect; and low proficiency, 83.5% Preterite and 83.9% Imperfect (p. 108). ANOVA revealed the heritage speakers and L2 learners differed from the monolingually raised controls for both verb forms, and the only significant difference between the heritage speakers and L2 learners was that the L2ers were more accurate with the Imperfect. There was a significant effect of proficiency level.

In the sentence conjunction task, both heritage speakers and L2 learners distinguished between the Preterite and Imperfect verb forms. However both groups accepted the Imperfect and rejected the Preterite at lower rates than the monolingually raised controls did, although the heritage speakers and L2 learners were not different from each other. Across the predicate types tested—achievements, accomplishments and statives—proficiency level and verb form were statistically relevant for all three, with L2 learners and heritage speakers only differing from each other in achievement and stative predicates.

As with Montrul (2009), Montrul and Perpiñan (2011) observed that the heritage speakers performed better for viewpoint aspect than for the subjunctive. In sum, they had an advantage over second language learners for viewpoint aspect, but not for mood morphology. The authors argue that this likely reflects an age of acquisition effect, and that the high performance of the L2 learners on the written morphological recognition tasks may be due to the highly metalinguistic nature of the task (p. 125).

In sum, Montrul's work and her work with colleagues demonstrates that Spanish heritage speakers diverge from monolingually raised native speakers of Spanish in their realization of the Preterite-Imperfect aspectual contrast. Across these studies, oral production, written production and comprehension tasks all uncovered varying degrees of divergence between some of the heritage speakers and the expected aspectual contrast. The sharp differentiation in performance by individuals at different levels of proficiency also points to the validity of the bilingual continuum (Silva-Corvalán, 1991).

4.5.2 Work by other researchers

Anderson (2001) provides a longitudinal case study of two Puerto Rican Spanish-English bilingual children, Beatriz (6;7–8;5) and Victoria (4;7–6;5), from a family where both parents were native speakers of Puerto Rican Spanish. The mother's English was native-like, while the father's English is described as being "Spanish accented" (p. 381). Spanish was the exclusive language used at home by the parents, unless monolingual English speakers were present, and the children used both languages with each other in the initial recordings, and exclusively English with each other by the midpoint of the study.

Anderson collected 12 samples of the children's individual interactions with their mother over a 22 month period (p. 382). Amidst a range of analyses of verbal morphology, Anderson expected that both children would have target-like tense and aspect distinctions in their Spanish recordings (p. 384). She extracted all Spanish verb forms used in the recordings, and coded them for regularity, tense, aspect, mood, person and number, alongside whether the verb use was correct or incorrect in the clause and in the discourse context. Over the 12 recordings, Beatriz produced 2.3–9% of her verb forms incorrectly, and Victoria produced 3.8–13.9% errors, with Victoria's production tending towards being more error-prone as she got older (p. 387).

For both children, errors in aspect form represented the lowest amount of errors they produced, at 8.5% for Victoria and 9.6% for Beatriz; both children were far more variable in their production of person-number distinctions and mood (p. 389). Beatriz produced aspectual errors in three of the recordings, at time 2, time 4, and time 6. Likewise, Victoria produced aspectual errors in three recordings, at time 1, time 8, and time 10 (p. 388).

Anderson only provides one example of an aspectual error produced by either child, in which they supplied fue una niña for era una niña (she/it was a girl), an example of a Preterite verb form being used for a continuous imperfective reading. All of Beatriz's aspectual errors were Preterite for Imperfect, and two of Victoria's three aspectual errors were of the same type (p. 389). Although it is not specified, it can be assumed that Victoria's remaining error was using an Imperfect verb form in a perfective context.

Looking at the complete verbal paradigm, Anderson concludes that, whilst there may be evidence of reduction in the tense and aspect distinctions maintained, this reduction was more a case of the children not using certain verb forms with certain verbs, as opposed to losing the distinction in their grammar (p. 394). In sum, then, Anderson (2001) provides limited evidence for reduction in the aspectual systems of the bilingual children that she surveyed. However, it should be noted that her recordings only captured a small period in the children's linguistic development, and it is

possible that, as they got older and more dominant in English, the children will have shown greater variability in their aspectual distinctions, especially Beatriz.

Silva-Corvalán (2003) examined the production rates of seven bilingual children from backgrounds of varying dominance in Spanish or English between ages 5;1–5;11, and compared this with the production data of adult bilinguals from her 1994 description of Los Angeles Spanish. Whilst Silva-Corvalán looks at the complete paradigm of tense-aspect-mood morphemes in Spanish, in this review I will primarily focus on the relevant aspectual distinctions.

To recapitulate the results of the adult bilinguals (Silva-Corvalán 1994; 2003: 377), nine of the ten individuals raised in the USA used Imperfect morphology in some perfective contexts. For imperfective contexts, five of the adults exhibited accurate use of the Imperfect, three individuals used the Preterite in some contexts, one showed non-use of the Imperfect in a number of obligatory contexts, and one showed non-productive use of the form.

For the majority of the bilingual children in the study, Silva-Corvalán collected six hours of recordings in English and Spanish, three hours in each, encompassing “free conversation, playing with puppets, answers to a set of questions about hypothetical situations, and narration of a story in a picture book” (2003: 379). For one child, the recordings were only collected in English, and for her two grandchildren she only used one hour of each language, including the narrative. The production information is generally similar across the board. Three of the children correctly used the Imperfect in all imperfective contexts, whilst three of the children occasionally used the Preterite in these contexts. Conversely, only one child correctly used the Preterite in all perfective contexts, and the remaining six all produced some Imperfect verb forms in these contexts.

Overall, Silva-Corvalán concludes that “by age 5;1 to 5;6, when bilingual US-born children start kindergarten, they have not yet acquired the complete system of tense, mood, and aspect in Spanish” (2003: 386). She also notes that the children in English-dominant contexts display the same reduced Preterite-Imperfect distinction as the adult bilinguals observed in her earlier study, even though they have not been exposed to this system. Silva-Corvalán gives evidence of the Preterite being used in habitual contexts (p. 386), and the Imperfect being used for stative verbs in perfective contexts (p. 387).

In common with Montrul (2002 et seq.), Silva-Corvalán argues that the simplification of the Spanish verbal system observed in adult bilinguals and the children in her study results from interruption to the acquisition process between ages 3;0 and 5;0, where increased exposure to English in the social context leads to reduced input in Spanish (p. 393). Following on from including them alongside other bilingual children in the 2003 paper, Silva-Corvalán (2014) has

produced an extended analysis of the language abilities of her two grandchildren, Nico and Brennan, in the first six years of life.

Partly arising from the order of acquisition observed in the children and partly arising from considerations of the full tense-aspect-mood systems of English and Spanish, Silva-Corvalán (2014: 268-269) proposed a hierarchy of verb form complexity in Latin American Spanish and English. Complexity was related to the ease of establishing temporal reference and the surface morphological and syntactic complexity of each form. As such, forms which include immediate temporal reference are in lower levels of the hierarchy, whereas more distant forms and those which are 'more linguistically complex' are found in the higher levels. Silva-Corvalán's hierarchy is as follows:

1. Present Indicative, Preterite, Present Participle, Imperative
2. Present Progressive, Periphrastic Future
3. Imperfect, Simple Future, Conditional, Present Subjunctive, Imperfect Subjunctive
4. Compound perfect tenses

Silva-Corvalán, 2014: 268-269.

The implication of this hierarchy is that forms in the first group should be easier to acquire and earlier acquired than forms in the second and lower groups of the hierarchy. Thus this hierarchy could lead us to predict that heritage speakers of Spanish would exhibit greater divergence from the baseline grammar of their input and less accuracy in using forms that are in the higher levels of the hierarchy.

Silva-Corvalán's (2014) data shows that whilst the initial stages of acquisition are broadly similar for both Nico and Brennan, with both using similar numbers of verbs with a verb small number of morphemes by age 1;8, with a substantially larger verbal system developing from then until around 3;0 (e.g. Table 7.12, p. 322). However, after this point the acquisition trajectories begin diverging; whilst both children's exposure to Spanish reduces, the reduction in exposure to Spanish is much larger for Brennan than for Nico, and their production rates and accuracy rates in this period reflects this difference (pp. 326-327). By age 6;0, Silva-Corvalán observes that Nico mastered the first two levels of complexity, had variable accuracy with the third level of complexity, and only produced some tokens of use of compound perfect tenses (pp. 328-329). His systematic errors were with past aspectual forms relating to using the Imperfect for the Preterite with a small number of stative verbs (Table 7.16 on p. 332). However, at the same age Brennan no longer produced any verb forms in the third and fourth levels of complexity (p. 331). Between 5;0 and 5;11, he only showed target-like competence of the Present, Present Progressive, Imperfect

Progressive and Perfect Future, with the Preterite generally appearing in Imperfect contexts apart from a small number of stative verbs for which the Imperfect replaced the Preterite (Table 7.16 on p. 332).

Cuza, Pérez-Tattam, Barajas, Miller and Sadowski (2013) examined the production of aspectual morphology in child and adult heritage speakers of Spanish. In addition to nine monolingual child controls, and three monolingual adult controls, the experimental participants were seven children between ages 5;0–7;4, six children between ages 8;1–9;11, and eleven adult heritage speakers (p. 201). The children in the older group were reported to be more dominant in English by their parents, whereas the younger children were generally reported to be more dominant in Spanish (p. 202).

The experimental participants completed the Little Red Riding Hood narrative retelling task used by Montrul (2002, 2009). The data of the monolingual controls were taken from previously recorded narratives by individuals age-matched to the heritage speaker participants available on the CHILDES database (p. 202-203). The results show that the bilingual children produced slightly more Preterite and periphrastic progressive constructions than the monolingual children, who in turn produced slightly more Imperfect and Present verb forms; Chi-squared tests revealed that the difference was significant for the Preterite, Imperfect and Present verb forms (p. 205). In contrast, the bilingual adults produced substantially more Preterite and Present verb forms, and far fewer Imperfect verb forms than the monolingual adults, each of which were significantly different in Chi-squared tests (p. 206).

Within the children, the younger group (ages 5–7) used substantially more Present verb forms, including the Present Progressive, whilst the older group (ages 8–9) used more Preterite, Imperfect and past Progressive verb forms. Chi-squared tests revealed that the differences between the children were significant form the Preterite and Imperfect verb forms, but not for the others. In other words, the older children were more likely to use both of the past tense forms than the younger children were (p. 208).

Overall, Cuza et al. found that where bilingual and monolingual children produced comparable rates of perfective and imperfective verb forms in percentage terms, in terms of the actual instances of use, the monolinguals produced significantly more instances of perfective and imperfective verb forms. Conversely, where adult heritage speakers produced fewer imperfective verb forms as a percentage, in numerical terms they used significantly more perfective verb forms, but similar numbers of imperfective verb forms (p. 210).

Comparing within the child groups again, the younger children (ages 5–7) produced significantly fewer perfective verb forms than the older children did (ages 8–9), who in turn produced more perfective verb forms than the adult bilinguals (p. 210). For monolinguals, the behaviour was the inverse, with younger children producing the most perfective verb forms, the older children the fewest with the adults between the two groups (p. 211). Overall, Cuza et al. argue that their results are indicative of both attrition and incomplete acquisition taking place. For the Preterite verb form, the production rate increased during childhood, but then the adult heritage speakers start using the Present tense in its place; for the Imperfect verb form, there is simply no change from the youngest to the oldest participants, suggesting that their knowledge of the Imperfect does not increase (p. 213). Without longitudinal data, it is impossible to see whether this indeed the developmental pathway for the two morphemes.

However, it is necessary to raise two important caveats to these findings. Firstly, the Little Red Riding Hood narrative is largely narrated using the Preterite verb form, as it effectively denotes a sequence of events with a few opportunities to use progressive and habitual actions (Montrul, 2009: 251). Consequently, the comparably low use of the Imperfect by the bilingual speaker groups compared to the monolingual groups in Cuza et al.'s study may reflect differences between the two narratives used. A related issue is that the study only reports on the proportion and number of each verb form used within the different groups, and does not provide any indication of whether the bilinguals were producing the verb forms in contextually appropriate ways. As such, it is difficult to tell whether the relatively high use of the Present verb form by the bilingual groups reflects a tendency to provide comments or additions to the story in the present time, or whether it reflects use of this verb form in lieu of the Preterite or Imperfect.

A final study that has investigated bilingual children's production rates of Spanish aspectual morphology is Cuza and Miller (2015). In this study, 19 children (aged 5;5–11;11) and 12 of their parents completed a question-after-story task. In this task, the participants were orally and visually given a short preamble providing an episodic or characterizing situation and a photo related to the situation, and then asked a question in response to which the child was expected to produce a Preterite or Imperfect verb form, in episodic and characterizing contexts respectively.

Overall, the results show that in episodic contexts, the children used the Preterite 69% of the time, the Imperfect 17%, the Present 5% and all remaining other forms 9%; their parents' production rates were 85% Preterite, 11% Imperfect and 4% other. In characterizing contexts, the children's production rates were 34% Preterite, 41% Imperfect, 19% Present and 6% other; by contrast, their parents used 1% Preterite, 92% Imperfect, 5% Present and 3% other. The significant differences between the parents, who effectively performed at ceiling, and their

children led Cuza and Miller to reject Rothman's (2007) Missing Input Competence Divergence Hypothesis (p. 223).

However, when they plot the children's accuracy on a graph (p. 224), a clear trend emerges where the accurate production rate of the Preterite is low for the youngest children, but generally remains relatively stable and high after the age of 6;4. For the Imperfect, on the other hand, there is greater variability between participants, but the accuracy rate generally increases rather linearly after 6;9 from a very low base. Unfortunately, Cuza and Miller did not find a statistical association between age and accuracy.

Comparing production rates of Imperfect and Preterite verb forms across different verb classes revealed that the children were substantially less accurate in using the Preterite with stative predicates, and similarly less accurate in using the Imperfect with activity, accomplishment and achievement predicates (p. 222, p. 225). Cuza and Miller (2015: 225) also investigated whether there was a relationship between children's accuracy and their dominance in Spanish or English based on parental report. A test for linear correlation between dominance and accuracy using Pearson's coefficient was not significant, although they suggest this may be related to the fact that the majority of the children were dominant in English.

4.6 L2 acquisition of Spanish viewpoint aspect

Many earlier studies of Spanish heritage speakers made explicit comparisons with L2 learners. Such comparisons have contributed interesting findings that have improved our understanding of the nature of heritage languages, and the comparison of different types of bilinguals, in this case early and late, further allows us to examine the nature of the human language faculty. However, the purpose of this short review of recent studies of the L2 acquisition of Spanish viewpoint aspect is primarily to establish the theoretical and methodological traditions that have informed the questions asked in heritage language acquisition, and to establish from this related sub-field which of these can be useful for the purposes of this dissertation. As such, I broadly leave aside the rich literature that has investigated the Aspect Hypothesis (e.g. Andersen & Shirai, 1996) in the L2 acquisition of Spanish viewpoint aspect morphology (e.g. Salaberry, 1999, 2003; Liskin-Gasparro, 2000) in favour of studies that examine L2 development focused on the cross-linguistic differences in viewpoint aspect morphology between English and Spanish.

One highly influential series of studies was conducted by Roumyana Slabakova and Silvina Montrul, assuming the theoretical account of viewpoint aspect propounded by Giorgi & Pianesi (1997). All of the studies used a proficiency measure adopted from the *Diploma de Español como Lengua Extranjera* (DELE) proficiency test, and all but Slabakova and Montrul (2008) also included

an inflectional morphology recognition task. Otherwise, the tasks used in the studies were sentence conjunction judgment tasks (Montrul & Slabakova, 2002, 2003; Slabakova & Montrul, 2002), a truth-value judgment task (Slabakova & Montrul, 2003), interviews that were independently rated to establish 'near-nativelike-ness' (Montrul & Slabakova, 2003), and a meaning judgment task (Slabakova & Montrul, 2008). Together, these studies demonstrate that advanced and near-native speakers are able to master the appropriate semantics for a variety of contrasts associated with the Preterite and Imperfect morphology. Slabakova and Montrul (2002, 2008) observed a clear developmental trend, with intermediate learners continuing to interpret aspects of the contrast in a more English-like way, but with advanced speakers demonstrating more target-like knowledge. Even for very rare distinctions, near-natives mostly performed in the range of native speakers (Montrul & Slabakova, 2003).

Arguing that the [±perfective] proposal of Giorgi and Pianesi (1997) is too narrow, Pérez-Leroux *et al*. (2008) adopt a substantially different approach to viewpoint aspect in which it is more closely related to lexical aspect (following De Swart, 1998), under which the Preterite and Imperfect are morphemes that are the appropriate past tense forms for specific aspectual combinations. As such, Pérez-Leroux *et al*. expected to find an asymmetry in the association of the Preterite to punctual and iterative events and the Imperfect to habitual events. They administered an acceptability judgment task to L1 English learners of Spanish in second and third year Spanish classes, targeting habitual, punctual, and two types of iterative context. Learners in both groups accepted the Imperfect in iterative contexts, and whilst they clearly favoured the Imperfect in habitual contexts, they only weakly rejected the Preterite.

Cuza (2010) used the same approach to viewpoint aspect, investigating L2ers knowledge of the Preterite-Imperfect contrast for stative and eventive predicates in characterizing and episodic contexts. In total, 42 participants were recruited to the study, of whom 14 were L2 learners who I focus on here. The participants completed a truth value judgment task (TVJT) and an acceptability judgment task (AJT). In the TVJT, the L2 learners typically overextended the Preterite to both types of characterizing situation, as well as of the Imperfect to both types of episodic situation. In the AJT, the L2ers only overextended the Preterite into stative characterizing situations, although they overextended the Imperfect into both types of episodic situation. Cuza concludes that the "transfer of the semantic properties of tense morphemes may better explain L2 learners' difficulties with tense and aspect" than having to acquire the new features (p. 204), as under Giorgi and Pianesi's (1997) analysis.

Following the collection of a corpus of L2 learner data on the acquisition of Spanish in the Spanish Learner Language Oral Corpus project (SPLLOC; Mitchell *et al*,, 2008), a second wave was collected

targeting the development of viewpoint aspect in L2 Spanish by 60 L1 English speakers at three levels of proficiency (Domínguez *et al*., 2013). The participants completed two oral production tasks, the *Cat Story* narrative retelling task and a personal interview, and a sentence-context matching task. In these studies, viewpoint aspect was understood to have the syntactic and semantic derivation proposed by Arche (2006, 2014), making the acquisition task one of feature reassembly. Some of the analysis of this data primarily focuses on the suitability of the lexical aspect hypothesis (i.e. Domínguez *et al*., 2013; Domínguez, 2019), which I leave to one side here. Domínguez, Arche and Myles (2011, 2017) found that of the various forms associated with the imperfective, it is the ones which are associated with the English Simple Past, which also expresses perfective meaning, that prove to be most difficult, especially the continuous, even at advanced levels. Variable rates of use of the Imperfect in imperfective contexts were visible in the beginner, intermediate and advanced groups, but these especially affected habitual and continuous contexts, rather than progressive contexts. This variability in production reflected a representational difficulty rejecting the Preterite in the habitual and continuous contexts, whereas the participants were more target-like rejecting the Preterite in progressive contexts.

In sum, this brief overview of recent research into the L2 acquisition of tense-aspect morphology shows two facts. First, the different aspectual form-meaning mappings are able to be acquired and even mastered at high levels of proficiency. However, it is especially clear when considering the groups with lower levels of proficiency that there is a substantial acquisition task, and that it is difficult to acquire the Spanish form-meaning associations. In view of this difficulty, it is not surprising that studies with heritage speakers have uncovered substantial divergence from the expected baseline norms.

4.7 Summary

In sum, the research across the studies into bilingual children and adult heritage speakers points to two general trends that have been observed in the aspectual distinctions maintained by Spanish heritage speakers. Firstly, many of them appear to lose the Preterite form for stative verbs, with the Imperfect being used in all situations. Secondly, the contrast between the Preterite and Imperfect seems to be substantially lost in imperfective contexts. Although the rate of Preterite production in imperfective contexts is never high in any of these studies, the way the authors describe these overextensions suggests that the Preterite is occasionally used in habitual and continuous contexts. Silva-Corvalán (2003: 386) explicitly referred to habitual contexts, and I take Cuza and Miller's (2015) concept of 'characterizing' situations seems to align with Arche's (2014) definition of habituality. The single example of Preterite for Imperfect given by Anderson

(2001) was a continuous context, although it is impossible to extrapolate what the other contexts were.

In the case of the second language studies, the general picture presented is one in which L2 learners are able to master some facets of the Preterite-Imperfect contrast, but there is residual difficulty even at very advanced levels. In particular, where Domínguez, Arche and Myles (2017) highlight that reassembly of the form-meaning mappings leads to greater difficulty in using the Imperfect and rejecting the Preterite in continuous, and to a lesser extent habitual, contexts, this corresponds to the production difficulties uncovered in many of the previous studies with heritage speaker bilinguals. As such, the notions of 'incomplete acquisition' and 'childhood L1 attrition' that had previously been used to describe heritage language acquisition may be less informative than arguing that the divergence observed in their grammars stems from Feature Reassembly (Lardiere, 2009), along the lines sketched out by Putnam and Sánchez (2013), and indeed by Hicks and Domínguez (2020).

Chapter 5 Experimental Design

5.1 Introduction

To recapitulate, the goal of this thesis is to investigate Putnam and Sánchez's (2013) model of Revised Feature Reassembly in heritage language acquisition. Using the case of Spanish past tense viewpoint aspect morphology, I am seeking to address the following principal research questions:

1. How are the features associated with viewpoint aspect assembled in the Spanish grammars of heritage speakers and baseline speakers in the United Kingdom?
2. In the case that the heritage speakers' assembly of viewpoint aspectual features diverges from the baseline grammar, how is this divergence manifested?
3. What is the role of the input and language access in the acquisition of viewpoint aspect in the heritage speakers' grammars? To what extent are measures of language access better at predicting heritage speakers' accuracy than measures of language input?

Under Putnam and Sánchez's (2013) feature-based model of cross-linguistic influence in heritage language acquisition, I would expect the viewpoint aspectual readings for which the greatest cross-linguistic differences between English and Spanish obtain to be the ones that will be most vulnerable to potential attrition in the grammars of the baseline speakers, and for the heritage speakers to diverge from the baseline as well. Given the form-meaning associations between various feature bundles derived by Arche (2014), schematised in Figure 12, I would predict that assembly of habitual and continuous meaning to the Imperfect to be the most vulnerable.

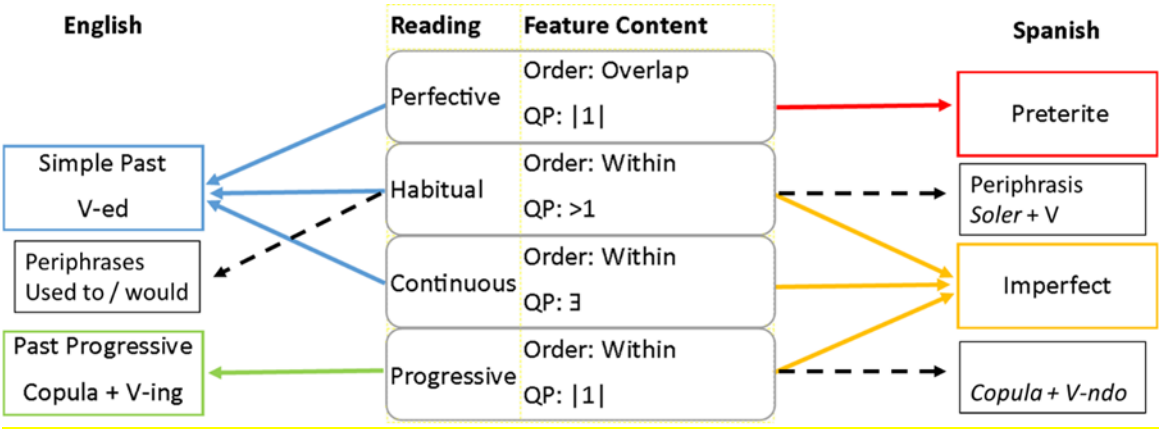


Figure 12: Domínguez, Arche & Myles' (2017) representation of the configurations of viewpoint aspect in English and Spanish under Arche's (2014) analysis.

In line with the previous literature on Spanish heritage speakers in the United States, I predict that feature-based divergence will obtain in the heritage speakers' grammars. Considering L1 attrition

as relating to representational change, the literature on L1 Spanish speakers in the UK is mixed; Cazzoli-Goeta and Young-Scholten (2011) argue that their participants have undergone attrition, whereas Domínguez (2013) finds a lack of representational change. As such, I remain agnostic as to whether the baseline speakers in the present study will systematically diverge from the expected norms representationally

If I do uncover divergence between the baseline and heritage speakers, I expect this to obtain in habitual and continuous contexts, and to manifest as increased use of and acceptance of the Preterite in these contexts relative to the baseline. This is in line with Putnam and Sánchez's (2013) argument that grammatical representations are less likely to be vulnerable to cross-linguistic influence than online production, and so I predict that any observed divergence will be more visible in production data than in comprehension data.

Putnam and Sánchez (2013) argue that since language activation measures give a better window onto whether heritage speakers have been using input in the heritage language to generate intake for acquisition than measures of input quantity alone, language activation measures will have greater relevancy than input quantity measures. As such, I follow their model and predict that this will be the case in the present study.

In the remainder of this Chapter, I will present the methodological design and participants of the study used to assess these research questions and predictions. In the following sections, I begin with an initial description of the participants who were recruited as part of the study. Following this, I present the methodological design of the current study in light of the previous studies as expounded in the literature review in Chapter 4. I subsequently provide an account of the procedure that will be used during the administration of the experimental tasks to the participants. Finally, I detail the procedure taken for transcribing and analysing the production data and for analysing the comprehension data.

In line with relevant internal and external policies regarding ethical considerations of working with human participants in general and children specifically as a vulnerable group, ethical approval of the research design elaborated throughout this chapter was obtained from the University of Southampton Faculty of Arts and Humanities Ethics Committee (Ethics number: 46537). Changes in procedure for data collection that took place subsequently to the Covid-19 pandemic, described below, were separately approved by the same Committee. Evidence of ethical approval for both the original submission and the amended procedure is provided in Appendix A.

5.2 Participants

The principal research participants in the project are Spanish-English bilingual children in the UK, aged between 5 and 15 years old. The age range is limited by the onset of the generally assumed language shift to dominance in the social majority language at around 5 years of age, the onset of schooling (Montrul, 2018), and the suggested upper limit of the sensitive period for morphology and syntax (Johnson & Newport, 1989). Each child started acquiring Spanish from birth, while due to the nature of the bilingual communities in the UK, the age of onset of English varies slightly. The criterion for inclusion in the study was that English onset was 5;0 at the latest, but in practice the latest age of onset of English was 1;9. As such, all of the children in the study qualify as simultaneous bilinguals.

The heritage speakers in the study come from families where either one parent or both parents speak Spanish. I assume that relevant differences between these families can be adequately described in the language input and access measures described below, although I also directly assessed whether there is a meaningful association between the heritage speakers' number of parents and their grammatical outcomes.

Polinsky (2018a: 16) highlights that there are two appropriate control groups for child heritage speakers. These are age-matched children in a social context where the language under investigation is dominant, or the adult speech community in the children's own social context who were themselves raised in a speech community where this language was dominant. The choice of children in an effectively monolingual setting allows developmental and acquisitional effects to be more clearly observed in the research, whereas the choice of adult bilinguals in the bilingual context allows for a greater understanding of the relationship between the input grammar received by the bilingual children and their grammatical outcomes. Additionally, a control group of monolingual adults to establish a baseline for the baseline would also be necessary in order to gauge whether any attrition or other effects were visible in the baseline grammar.

Therefore, in addition to the main group of participating children, there are effectively three control groups that would be necessary to get a complete understanding of Spanish viewpoint aspect in the heritage speaker context. The specific research questions for the study focus almost exclusively on the relationship between the baseline and heritage speakers' grammars, rather than whether these grammars are expected Spanish norms per se. Another potential issue was matching the regional characteristics of the participants, who came from a variety of countries in which there may be relevant differences in the acquisitional trajectory and baseline grammar that would have further complicated easily comparing the behaviour of the control and participant

groups (see Sections 3.6 and 4.4). As such, it is my view that in the narrow context of the present study, the only necessary comparison to understand the heritage speakers is the baseline grammar, and I have therefore elected only to collect data from the parental baseline. However, this does limit the effectiveness of the study in relating it back out to the broader context, and means that in places I have only been able to speculate or provide partial examinations of some facets of the data. In the case of monolingual adults, this essentially only affects whether there is evidence for attrition in the UK baseline speakers, but a group of monolingual children would have elucidated clearer answers regarding participants' age and related effects such as cognitive maturity.

Although a precise measure of statistical power will provide a more accurate estimate of the necessary 'largeness' of a study (Quené, 2010; Plonsky & Oswald, 2014, 2017), computing statistical power requires a clear estimate of expected effect size and variability in the data, something which is not necessarily feasible when investigating a new population. In the absence of clear estimates of effect size and variability, sample size for this study is predicated upon group size in previous studies. Amongst other groups of participants, Cuza *et al.* (2013) recruited 13 child heritage speakers, while Fernández-Dobao and Herschensohn (2020) recruited 21. In both cases, the child heritage speaker group was smaller than the other groups. In a more methodologically similar study, in terms of using correlation-based analyses across various ages, Cuza and Miller (2015) recruited 19 child heritage speakers between ages 5;5 and 11;1. Cuza and Pérez-Tattam (2016) recruited 31 child heritage speakers between ages 5;0 and 10;8. In the present study, I recruited 25 children in 15 families, along with 16 of their parents, which is similar to the previous studies, but fewer than the number recruited by Cuza and Pérez-Tattam, and spread across a larger range of ages. Table 1 summarises the total number of participants in the study.

Table 1: A summary of the total number of participants in the present study

Group	**Number of participants (n)**
Child heritage speakers	25
Adult bilinguals (baseline controls)	16

The participants were recruited through local contacts in Southampton and the surrounding area, including two families based in London. Eight of the families came from Spain, three families came from Mexico, three from Argentina and one from Colombia, although the Colombian family had accommodated to European Spanish norms following an extended period living in Spain prior to moving to the United Kingdom. As such, nine families spoke European varieties of Spanish, and six families spoke Latin American varieties of Spanish. Table 2 provides a summary of the geographical origins of the families in the research project.

Table 2: Information about the geographical origins of the families in the research project

	Children	Parents	Families
Argentina	4	3	3
Colombia	1	1	1
Mexico	6	3	3
Spain	14	9	8
Europe	15	10	9
Latin America	10	6	6

In Section 3.5, I examined regional variation in the expression of viewpoint aspect in different regional varieties of Spanish. The parents from each of the Spanish-origin families were from regions were the Present Perfect has extended into recent perfective contexts, meaning that the use of the Present Perfect in specific perfective contexts is permitted in the baseline for the heritage speakers. One of the families from Argentina, comprising one child and one parent, came from the north-western area of the country where a similar extension has taken place.

5.3 Summary of previous methodologies

In general terms, the studies I reviewed in Chapter 4 made use of three types of data: naturally occurring or semi-spontaneous language use (e.g. Silva-Corvalán, 1994), elicited production in experimental tasks (e.g. Montrul, 2002), and elicited measures of comprehension in experimental tasks (e.g. Montrul, 2002). Whilst many of the studies combined these different types of data, others exclusively used one of the data types. Domínguez (2019) has observed that reliance on production or comprehension data only can often lead to unreliable results, whereas combining methodologies provides a more complete understanding of the acquisition of aspect.

As an example, in the aspect study of the SPLLOC project, Domínguez, Arche and Myles (2011; 2017) collected naturalistic production, experimentally elicited production and comprehension data. As such, the results provide a more holistic overview of the relationship between lexical aspect and grammatical aspect in the L2ers' grammars than many previous studies had. Consequently, the results of this study constitute reliable evidence for testing relevant hypotheses on the acquisition of aspect in L2 populations (Domínguez, 2019).

The current trend in L1 acquisition research on the comprehension of grammatical aspect has been to use a design in which multiple images or videos are used to ensure that contexts are as fully available to participating children as possible (García del Real Marco; see also van Hout, 2016). However, this method is designed for use with studies testing the complete/ongoing subset of grammatical aspect (van Hout, 2016: 606), corresponding to Arche's (2014) perfective and progressive readings, and no studies use a similar design to test comprehension of habitual and continuous contexts by children (van Hout, 2016: 610). Indeed, it is difficult to see how this

design could be adapted for use with these meanings. As an example, habituality might be conveyed through watching a character or puppet complete an action several times with embedded cues such as calendars emphasising the habituality of the activity. However, the added complexity this brings makes it more likely that a participant could miss the pertinent information and instead view the videos as an iterative context, which is a type of perfective context in Romance languages.

The studies on L1 acquisition of aspect in children mainly used oral modality for production, and oral modality with visual stimuli for comprehension tasks (e.g. Hodgson, 2005). This has also been the case in studies focusing on younger heritage speakers (e.g. Cuza & Miller, 2015). Conversely, many of the studies with adult heritage speakers and L2 learners have relied on written modality for both production and comprehension tasks (e.g. Montrul & Perpiñan, 2011), or have used a combination of written and oral modality for these tasks (e.g. Montrul, 2002). Montrul (2016: 181) highlights that since many heritage speakers do not become literate in their heritage language, the use of oral tasks is more likely to accurately reflect heritage speakers' competence. As such, oral modality will be used throughout the present research project.

5.3.1 Production tasks used in previous studies

Of the oral production tasks used in previous studies into the acquisition of viewpoint aspect in relevant groups, the vast majority have been narrative retelling tasks based on picture prompts (Montrul, 2002, 2009; Domínguez, Arche & Myles, 2011, 2017; Cuza et al., 2013), or shorter individual descriptions based on videos (Hodgson, 2005; García del Real Marco, 2015). The two narratives used with picture prompts in these stories have been *Little Red Riding Hood* (Montrul, 2002, 2009; Cuza et al., 2013) and the *Cat Story* (Domínguez, Arche & Myles, 2011; 2017).

The video narrative retellings have almost exclusively focused on the complete-ongoing part of the perfective-imperfective split, such as asking participants to narrate what they saw in a silent video to an interested, blindfolded puppet observer (García del Real Marco, 2015: 207). As such, this format is an extremely useful and informative task for investigating this dimension of the preterite-imperfective contrast. However, it is not easily adaptable to the habitual and continuous sub-types of imperfective.

The picture-based narrative retelling tasks, however, benefit from the density of the narrative and the opportunity participants have to embellish their descriptions with additional information if they so desire. Both the *Little Red Riding Hood* and *Cat Story* narratives are therefore highly suitable for this research. Whilst the Little Red Riding Hood prompts have been used in more previous studies, the Natalia y Pancho story has two further benefits. First, it has been explicitly

designed with prompts that elicit contexts in which perfective and various readings of the imperfective are expected to be used. Secondly, the Natalia y Pancho story is less likely to be known by the participants, thus reducing the likelihood that their descriptions are examples of learnt behaviour.

5.3.2 Comprehension tasks used in previous studies

Previous studies into the acquisition of grammatical aspect in relevant groups have used sentence-context matching tasks (Hodgson, 2005; Domínguez, Arche & Myles, 2011, 2017), picture selection tasks (Hodgson, 2005; García del Real Marco, 2015), truth value judgment tasks (Montrul, 2002, 2009; Montrul & Perpiñan, 2011; García del Real Marco, 2015) and a sentence conjunction task (Montrul, 2002). As has already been highlighted, one of the issues with the use of instruments used in many previous studies is that the focus of these studies has almost exclusively been on ongoing and complete interpretations within the broader distinction between perfective and imperfective meanings (van Hout, 2016). The only study with comprehension data that has looked at all four of the meanings associated with perfective and imperfective morphology is the sentence-context matching task developed by Domínguez, Arche and Myles (2011, 2017).

The use of videos in comprehension tasks (e.g. García del Real Marco, 2015) discriminates between perfective and progressive contexts extremely well, but is less effective for representing habitual and continuous meanings. Prior to the use of these short videos, studies had made use of multiple pictures, showing events at differing stages of completion (van Hout, 2016). Again, this design is very effective at distinguishing perfective and progressive contexts very clearly, but it is likewise difficult to adapt easily for the illustration of habitual and continuous contexts. In sum, the current design of these tasks from L1 acquisition studies are not appropriate for use in the present study, as they do not allow the full range of aspectual meanings associated with perfective and imperfective morphology to be accounted for in detail.

5.4 Methods in the present study

Both production and comprehension data are necessary to capture a reliable overview of the baseline and heritage speakers' grammaticalisation of viewpoint aspect. Crucially, since the present study is dealing with child heritage speakers at a variety of different ages and levels of literacy relating to their age and differences in access to education in the heritage language, provision of tasks in oral rather than written modality is more accessible. In addition, controlling

for proficiency is necessary due to the heterogeneity of heritage speakers. Finally, the hypotheses under investigation require the collection of input and activation measures.

In this section, I detail each of the tasks used in the study. Production data was collected using the *Cat Story* narrative retelling task. Comprehension data was collected using a modified version of the semantic interpretation task originally used in the Spanish Learner Language Oral Corpus (SPLLOC; Domínguez *et al*., 2013). The *Loch Ness* narrative retelling task was also used as an independent story from which speech rates could be calculated for both English and Spanish, as a proxy for proficiency in each language. The last task was a questionnaire derived from the Bilingual Language Experience Calculator (BiLEC; Unsworth, 2013) to measures participants' input to and activation of Spanish.

5.4.1 The *Cat Story* narrative retelling task

A variety of considerations point to the suitability of the Cat Story narrative retelling task that was successfully used with a variety of age groups in the SPLLOC project (Domínguez *et al.*, 2013). In this task, the participant has to describe a series of pictures that commence with a description of everyday occurrences in the life of a child, Natalia, and her cat, Pancho and then continue with the specific occurrences of a single day. The first section primarily consists of habitual and continuous contexts that require imperfective morphology, whereas the second section primarily consists of perfective contexts, requiring the use of perfective morphology, although all three readings of the imperfective can be used appropriately in this section as well.

Some alterations were made to the presentation of this task. Firstly, to ensure it would be very clear to the children that they were telling a story taking place in the past, rather than the present, without explicitly asking them to use past tense, a new start was given in which it states that Natalia is an old lady who is thinking about her childhood, incorporating the original starting prompt. A second change was changing the layout from sequential A4 sides into a booklet to make the activity more appealing for the younger children in the study. Figure 10 shows some examples from the task, and the complete booklet is provided in Appendix B.

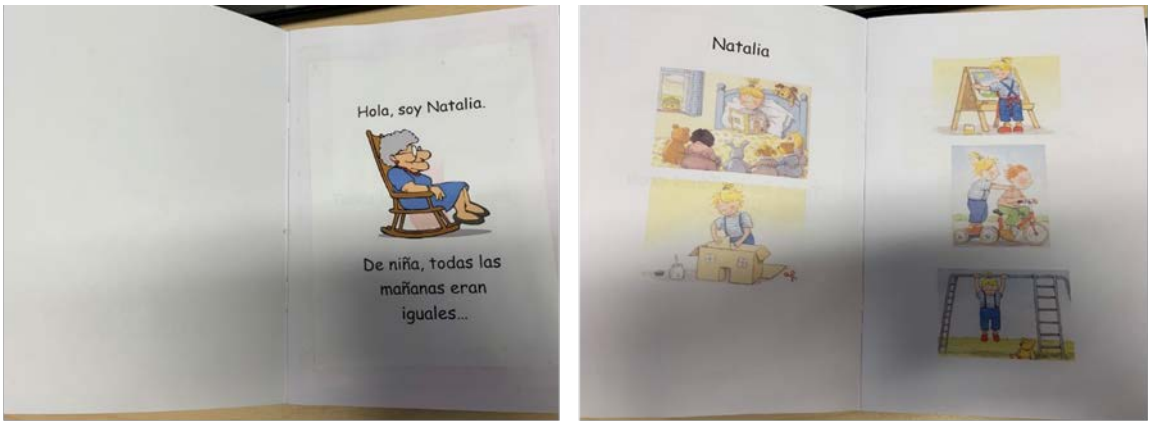


Figure 13: Examples of some of the prompts used in the Cat Story narrative-retelling task. These pages show the recast initial prompt and the first set of habitual activities.

5.4.2 The bimodal oral-written semantic interpretation task

A new bimodal semantic interpretation task was designed for use in the present study, drawing its core design principles from the SPLLOC comprehension task (e.g. Domínguez, Arche & Myles, 2011). One crucial difference is that the contexts were provided in Spanish rather than English, with written and audio versions of the contexts available concurrently. The audio version was embedded in a video file with a static image that represents the context. This picture is intended to help the younger children to engage more with the context, although this will naturally be less informative relative to the context itself than the pictures or videos used in the more focused completed-ongoing studies. The audio segments were recorded by a speaker of Mexican Spanish who has been resident in the United Kingdom for several years.

Another difference between the current project and the SPLLOC task is that the relationship between grammatical aspect and lexical aspect was integral to the design of the SPLLOC project, whereas the association between these two different types of aspect is incidental to the current project as the Lexical Aspect Hypothesis (Andersen & Shirai, 1996) is not under investigation. The only relevant contrast in lexical aspect is the static-dynamic contrast in naturalness of combination with progressive or continuous meanings. As Domínguez (2019) highlights, whilst lexical aspect affects the distribution of viewpoint aspect in natural speech, when the context is forced, lexical aspect does not affect learner's grammaticality judgments.

In view of the age range of the participants, 5-15 as highlighted in Section 5.3 above, the number of items has had to be kept smaller whilst still ensuring reliability. In line with the design of the original task in the SPLLOC project, there are 18 contexts in this task. In order to ensure that the task would be easily completed by children in the youngest age groups, no fillers were included.

The items were balanced according to verb form, and as such there are nine Preterite and nine Imperfect contexts, translating to nine perfective, three habitual, three continuous and three progressive contexts. Each context includes a Preterite and Imperfect test item, of which only one is appropriate in the specific context. One example of each context type with its associated test sentences is provided below, in sentences 1 to 4, where appropriate test items are underlined and inappropriate ones are accompanied by the # symbol.

1. PERFECTIVE CONTEXT:

   Anita es una abeja a quién le encanta cocinar todo tipo de comida. Quería cocinar algo delicioso para la fiesta de Raquel. Sabía que a ella le gustan las galletas.

   Anita is a bee who loves cooking every type of food. She wanted to cook something nice for Raquel's party. She knew that she likes cookies.

   SUMMARY 1: Anita la Abeja <u>hizo</u> galletas para la fiesta

   Anita the bee <u>made-PRET</u> cookies for the party

   SUMMARY 2: #Anita la Abeja hacía galletas para la fiesta

   Anita the bee #made-IMP cookies for the party

2. HABITUAL CONTEXT:

   Por su tamaño, Eduardo el Elefante necesita tomar mucha agua. Cuando era joven, tenía que tomar una botella entera cada hora para mantener su crecimiento.

   Because of his size, Eduardo the Elephant needs to have a lot of water. When he was young, he had to have a whole bottle every hour to keep on growing.

   SUMMARY 1: #Eduardo el Elefante bebió mucha agua

   Eduardo the Elephant #drank-PRET a lot of water

   SUMMARY 2: Eduardo el Elefante <u>bebía</u> mucha agua

   Eduardo the Elephant <u>drank-IMP</u> a lot of water

3. CONTINUOUS CONTEXT:

   Cuando Gabriel el Gato llegó a la fiesta de Raquel la Ratona, notó las decoraciones maravillosas.

   When Gabriel the Cat arrived at Raquel the Mouse's party, he noticed the marvellous decorations.

   SUMMARY 1: #El cartel adornó la pared cuando Gabriel llegó

   The banner #hung-PRET on the wall when Gabriel arrived-PRET

   SUMMARY 2: El cartel <u>adornaba</u> la pared cuando Gabriel llegó

   The banner <u>hung-IMP</u> on the wall when Gabriel arrived-PRET

4. PROGRESSIVE CONTEXT:

   Raquel la Ratona estaba sentada, comiendo galletas, cuando vio a Gabriel el Gato llegando a la fiesta.

   Raquel the Mouse was sitting, eating cookies, when she saw Gabriel the Cat arriving at the party.

   SUMMARY 1: #Mientras Raquel la Ratona comió galletas, llegó Gabriel

   While Raquel the Mouse #ate-PRET cookies, arrived-PRET Gabriel

   SUMMARY 2: Mientras Raquel la Ratona comía galletas, llegó Gabriel

   While Raquel the Mouse ate-IMP cookies, arrived-PRET Gabriel

The full set of test items, contexts and images is provided in Appendix C. In the Appendix, the lexical aspect of the items is included in square brackets after the translation of the test sentences, and each of the four viewpoint aspect readings has a different coloured background for visual clarity. Whilst acceptability judgment tasks of this style are typically deployed using a five- or seven-point scale, in order to reduce the complexity of the task for the youngest children I chose to use a three-point scale, with acceptable and unacceptable at each edge, and an unsure option between the two. The presentation of items in the task was fully randomized.

After hearing the contextualisation, the participants were presented with both the audio and written versions of the two statements, which differed only in terms of use of the Preterite and Imperfect, at the same time. The instructions were recorded by the same Mexican Spanish speaker who recorded the contexts and test items, and specified that participants had to choose whether each item was acceptable or not in the context, and that in each case either, none or both of the items could be acceptable.

Another consideration taken into account to reduce the complexity and difficulty of the task, especially in view of the younger participants in the study, was that no follow up to the task asking about reasons for choices was administered. This consequently limits the usefulness of the task in assessing whether additional linguistic factors not related to the aspectual morphology may have affected the participants' ratings.

5.4.2.1 Pilot of the semantic interpretation task

Since this modified task is original to the study, I piloted the semantic interpretation task with eight monolingual adult speakers of Spanish to ensure that the necessary aspectual contrast was observed for each context. Three were Latin Americans, from Bolivia, Colombia and Mexico, and four were Spaniards, from the Canary Islands and Galicia. The pilot participants were asked to rate

the items on a five-point scale, indicate whether the associated image appropriately reflected the context, and to note anything about the context, items or images.

Unlike for the main version of the task, the pilot version only included the text for the contexts and items. This is because the audio versions were only recorded after the final items were established on the basis of the ratings from the pilot. The pilot ratings for each of the items are provided in Table 3. As can be seen in the table, six of the items were deemed to be too ambiguous, and were revised in line with the comments. For Context E2, most participants noted that the picture was inappropriate and that that had affected their judgments. In the case of Context E3, several participants noted that they had seen the Preterite version of the item twice, although it is unclear why this happened since the remaining participants saw both the Preterite and Imperfect version. Although the revised rating for the Preterite in Context R2 remains slightly higher than all other ratings for the Preterite in imperfective conditions and for the Imperfect in the perfective condition, the substantially increased difference between the two forms led me to decide that the item was discriminatory enough for the purposes of this study.

Table 3: The average ratings for each item given in the pilot stage. Items marked with a '*' were deemed to be inappropriate on the basis of the pilot study. The ratings for the revised set are provided as well.

		Preterite rates		**Imperfect rates**	
Condition	**Context**	**Original**	**Revised**	**Original**	**Revised**
Perfective	A1	4.8	-	1.0	-
	C1	4.8	-	1.4	-
	E1	4.8	-	1.8	-
	G2 *	**3.2**	**5**	**3.8**	**1.0**
	O1	5.0	-	1.8	-
	R1 *	**4.6**	**4.2**	**2.4**	**1.0**
	F1	5.0	-	1.6	-
	F2	4.4	-	1.0	-
	F4	4.8	-	1.0	-
Habitual	C2	2.0	-	4.8	-
	E2 *	**1.0**	**1.6**	**3.6**	**4.2**
	O2	1.4	-	4.2	-
Continuous	**A2 ***	**2.2**	**1.8**	**4.4**	**4.6**
	G1	1.4	-	4.6	-
	R2 *	**2.6**	**2.2**	**4.0**	**4.6**
Progressive	A3	1.0	-	4.2	-
	E3 *	**1.0**	**1.0**	**2.4**	**4.2**

Condition	Context	Preterite rates		Imperfect rates	
		Original	Revised	Original	Revised
	F3	1.0	-	4.8	-

5.4.3 Proficiency control measure

As heritage speakers are known to exist on a continuum of proficiency (e.g. Polinsky, 2018a), it is important to control for the heritage speakers' proficiency in both languages in order to ensure that all results are interpreted in light of the relevant portion of the spectrum for which the study gives evidence. Proficiency is also one of the implicit measures of language activation argued to be associated with language activation and thus it is a predictor variable under the Differential Access account (Putnam & Sánchez, 2013; Putnam, Perez-Cortes & Sánchez, 2019). Various measures of proficiency have been successfully applied to heritage speaker populations (Montrul, 2016). Because all research tasks need to be accessible for heritage speakers at different ages, this rules out using written modality tasks. Furthermore, many proficiency tasks also involve a high degree of meta-linguistic awareness, or have little ecological validity, both of which matter when working with younger children in general and heritage speaker populations in particular.

As such, the measure of proficiency that I used for both languages in the present study is the participants' speech rate. Speech rate has been found to correlate strongly with other, more explicit measures of proficiency such as lexical knowledge (Polinsky, 2008; Nagy & Brook, 2020). As some individual and regional differences affect speech speed, the speech rate has to be collected for both languages in the bilingual dyad using comparable narratives. Whilst the Frog stories have been successfully used for this purpose in previous research (e.g. Polinsky, 2008), in the present study I have elected to use the *Loch Ness* narrative retelling task. Similarly to the *Cat Story* narrative retelling task, the *Loch Ness* narrative retelling task was used successfully across different ages in the SPLLOC study (e.g. Mitchell *et al*., 2008). As with the *Cat Story*, I adapted the presentation so that the story progressed in a booklet format. The participants narrated the story in Spanish at the start of the data collection session and in English at the end of the session. The *Loch Ness* narrative retelling task in its booklet format is available in full in Appendix D.

Numerous methods exist for measuring speech rate, and considerations relating to how to treat or control for other aspects of fluency such as whether to count or remove pauses are also important (see e.g. Segalowitz, 2010, Chapter 2 for a concise review of several studies). First, there is a choice of linguistic unit and time unit for the measurement; Nagy and Brook (2020) point to words per minute and syllables per second as widely used measures. In their cross-linguistic study of multiple heritage languages in Canada examining the contribution of various variables in addition to proficiency on speech rate, Nagy and Brook (2020) elected to use syllables

per second which has been argued to be more useful and accurate for cross-linguistic purposes (e.g. Roach, 1998). Although she does not provide details of how exactly she calculated it, Polinsky (2008) used words per minute to establish a proficiency profile for the heritage speakers in her study against a monolingual baseline for the purpose of investigating the relationship between proficiency and grammatical gender. Since my purposes align more closely to Polinsky's, I have chosen to use the same measure here even though it is potentially less informative than syllables per second. Montrul (2016: 181) suggests that a simple count of words per minute provides an index in which disfluencies, hesitations and difficulties with lexical access contribute to a lower speech rate and reflect overall proficiency; as such, in my analysis I have used this simple count suggested by Montrul, even though some of the variation in speech rate resulting from disfluencies and pauses may reflect other factors.

5.4.4 Bilingual exposure questionnaire

Since Putnam and Sánchez (2013) make claims relating to the adequacy of input quantity and language activation measures for understanding heritage language acquisition, reflected in the research questions under investigation, it was necessary to measure these variables for the heritage speakers. Unsworth's (e.g. 2000) Bilingual Language Experience Calculator (BiLEC) is flexible and can be used with children across more age ranges than similar questionnaires (Unsworth, 2019), and automatically calculates several measures of language exposure and access for bilingual children. For the purposes of the study, I adapted the input method from directly into the spreadsheet into a questionnaire. The derived questionnaire created for data collection in this study is provided in Appendix E, alongside a link to access the original materials including the spreadsheet.

Using the responses to the questions, I extracted two measures of input quantity and one measure of language access that directly pertained to the research questions. The measures of input quantity extracted were cumulative exposure to Spanish, providing an estimate of all of the child's life in which they have heard Spanish, and relative exposure to Spanish, which provides an estimate of the current proportion of daily life the child is exposed to Spanish rather than English. The measure of language access I extracted was relative output in Spanish, which tracks how much the child uses Spanish in daily life as a proportion of all languages used.

Because the questionnaire collects data about a wide range of exposure-related phenomena, it also allowed for the extraction of a number of additional potentially confounding variables. These include the participants' age at time of testing, richness of sources of exposure to Spanish, age of onset of bilingualism (i.e. of English), and mother's education level, which is widely understood to

be a proxy for socio-economic status (e.g. Mueller Gathercole *et al*., 2010). In view of Polinsky and Scontras (2020: 14) effectively viewing input quality as relating to the spheres in which the heritage language is encountered, I have considered richness of sources of exposure to Spanish to be a proxy for input quality.

5.5 Procedure for data collection

This project was conducted in line with the ethical regulations and procedures of the University of Southampton, following the granting of ethical approval by the Faculty of Arts and Humanities Research Ethics Committee (ERGO number: 46537). Documentation of ethical approval is provided in Appendix A. Initial contact with participating families was made through personal conversations and email prior to the start of data collection. The procedure of the research project was as follows.

Participant recordings were collected either at the University of Southampton or in participants' houses, according to the preferences of the families as arranged by email. The final participant recordings were made online using Microsoft Teams due to the Covid-19 pandemic. Email contact also made it clear to parents that Spanish was going to be used exclusively by the researcher during the data collection time, until the switch to English for the final task. In all cases, at least one parent was present at the recording for safeguarding purposes.

On arrival, the parent was asked to read and review the participant information, and had the chance to ask any questions before providing consent, in consultation with their child where appropriate. The parent then completed the Bilingual Language Experience Calculator questionnaire on behalf of their child, whilst the child received an initial briefing about what they would be doing during the session, the fact that they were going to be recorded, and that they could pause at any time to ask questions or take a break as necessary. For the families who participated online, the parent completed the BiLEC questionnaire along with the researcher following administration of the production and comprehension tasks using an online interface.

The first task that the children completed was the Spanish proficiency measure, the *Loch Ness* narrative-retelling task. This narrative was presented using a booklet that contained all of the pictures in order. For the online participants, the booklet was shared in pdf format via screen share, with screen control given to the participants where possible. Following this, the children completed the production task, the *Cat Story* narrative-retelling task. This narrative was also presented using a booklet or pdf that contained all of the pictures in order. After this, participants completed the semantic interpretation task using a web interface. Before the Covid-19 pandemic, this was using the researcher's laptop, although subsequently the link was shared and they

accessed it using their own device. Finally, the children re-told the *Loch Ness* narrative-retelling task, this time in English, again presented in booklet or pdf format.

Following completion, the parent then completed the two experimental tasks, the *Cat Story* narrative-retelling task and the semantic interpretation task. The total amount of time needed by each family varied depending on whether a family had more than one child taking part in the research project. Participating families were financially reimbursed with £5 per child.

5.6 Procedure and methods for data analysis

Following data collection, the answers to the BiLEC questionnaire were input into an individual Excel spreadsheet, and the relevant measures of exposure and activation were then transferred to a separate Excel spreadsheet that contained information on all participants. On a separate tab in this Excel spreadsheet, all of the ratings for each item of the semantic interpretation task were imported from the web interface, with columns for participant, context type (aspectual reading), item, verb form, and rating. The rating was transposed from 1 to 3, the original scale, to -1 and 1, which made acceptance and rejection more immediately clear. Formulae in further columns recorded whether the rating was classified as accepting (1) or rejecting (0) the morpheme, and finally whether this acceptance or rejection was accurate (1) or inaccurate (0) in the context.

In a further tab, participants' individual mean rating and percentage accuracy for each morpheme in each context type was calculated using formulae. This was combined with the individual participant information. Group mean ratings and mean accuracy for each morpheme in each context were calculated from the data within the spreadsheet, and the individual data was extracted into a csv file and exported to the R statistical software package (R Core Team, 2017) for analysis.

The recordings were transcribed using Microsoft notepad. For the *Loch Ness* story recordings, the amount of words spoken by the participant were divided by the amount of time in minutes that the child spoke for. For some children, it was impossible to use the raw speech rate for two reasons: recourse to English for large sections or other interruptions, and reliance on a parent to provide almost the whole narrative. In these cases, short periods where the child spoke Spanish unprompted were used to calculate a series of estimates of the speech rate, and the total words and time of these shorter parts of the recording were used to calculate a speech rate for the participant. In each of the relevant cases, the speech rate is approximately similar to or slightly lower than that of other children with similar characteristics as measured through the BiLEC questionnaire, although it is likely that this estimate is slightly higher than the child's ability in

some cases. Where speech rates are reported with participant information, these affected speech rates are highlighted separately.

For the *Cat Story*, the transcripts of the recordings were divided into units around verb phrases, corresponding to clauses, although subordinate clauses were always treated separately rather than as part of the matrix clause in the analysis. These units were copied into another tab in the same Excel file. Within this file, each verb used was analysed for morphology and context type. In view of the general usage patterns, I was primarily interested in the use of Preterite, Imperfect, Present, Conditional, and 'Other' verb forms in perfective, habitual, continuous, and progressive contexts. Other contexts, such as 'present' for Present narration, were also tracked but I did not use these contexts for any of the analysis. The other verb forms and context types included infinitives, participial uses, perfect constructions, and subjunctive forms; the use of dedicated progressive morphology was classed as a subtype of Present and Imperfect, and were treated alongside these in the relevant analyses.[12] These individual uses of verb phrases were separately collated for each participant in another tab. Target-like usage (TLU) of each verb form was calculated using the traditional formula of target-like uses divided by the sum of obligatory contexts and instances of overuse of the morpheme. For the different readings of the Imperfect verb form, the accuracy calculation was only within those context types, which is to say target-like suppliance of the Imperfect morpheme divided by all contexts of this type, as the TLU measurement relates to the morpheme, not the reading. These accuracy rates were then extracted in a csv file alongside the participant information and imported into the R statistical software package (R Core Team, 2017) for analysis.

Since the total number of cases is 25 children and 16 parents, neither group is large enough to assume that the necessary assumptions for parametric statistical methods hold, especially for the baseline group. I carried out Shapiro-Wilkes tests to assess whether an assumption of normality held for the data, but the results of these tests indicated that it did not for nearly every single subset of the data. As such, I conducted statistical analysis using non-parametric methods. Principal comparison between groups has been done using the Wilcoxon rank sum test, while within group comparisons was conducted using the Wilcoxon signed rank test. These tests were also used by Fernández-Dobao and Herschensohn (2020) in their recent investigation of the Revised Feature Reassembly model. The effect of relevant predictor variables was computed using correlation tests. The main analysis focuses on Spearman's rank correlations, as linear

[12] One parent used a Preterite Progressive construction, a valid option that does not neatly fit into the perfective-imperfective dichotomy (see Arche, 2014). This specific case is discussed in the results section, and was treated as target-like use of the Preterite morphology in the analysis.

correlations partially rely on an assumption of normality in the data. Both of these tests are part of the base statistical analysis in R (R Core Team, 2017). All graphs were created using the 'ggplot2' package (Wickham, 2016).

5.7 Summary

In sum, in this chapter I have elaborated upon the experimental design of the present study. I began with an initial description of the participants in the study. This was followed by a description of each of the tasks that were used as the method; in addition to the experimental tasks, the *Cat Story* narrative retelling task and semantic interpretation task that target viewpoint aspectual morphology, I also used the *Loch Ness* narrative retelling task to calculate speech rates in both languages as a proxy for proficiency and a questionnaire derived from the BiLEC questionnaire to capture information about individual differences between the participants, especially in terms of language activation, input quantity, and input quality. As the only original task in the design, I also presented details about the piloting of the semantic interpretation task. After this presentation of methods, I described the procedure used for data collection in both the in-person and online iterations of the study. Finally, I detailed the procedure for data analysis. I present the results and analysis in the next chapter.

To recapitulate, several appendices are related with the experimental design presented in this chapter, and I summarise them here for convenience. Appendix A provides confirmation of ethical approval. Appendix B presents the *Cat Story* narrative retelling task. Appendix C enumerates each of the contexts used in the semantic interpretation task. Appendix D is the *Loch Ness* narrative retelling task. Finally, in Appendix E, I present the questionnaire the parents completed that I then input into the BiLEC spreadsheet as well as a link to the original BiLEC resources.

Chapter 6 Results

6.1 Introduction

In this chapter, I present the results of the dissertation study as outlined in the previous chapter. Before describing and analysing the results, however, I briefly recapitulate the theoretical account, the predictions arising from this account, and the research questions I am investigating in this study.

6.1.1 Goal, theoretical account and predictions

The goal of this thesis is to investigate the suitability of the Feature Reassembly Hypothesis (Lardiere, 2009), specifically as adapted for heritage speakers by Putnam and Sánchez (2013), for understanding heritage language acquisition. I have done so using viewpoint aspect as a test case for the hypothesis. The study addresses the following research questions:

1. How are the features associated with viewpoint aspect assembled in the Spanish grammars of heritage speakers and baseline speakers in the United Kingdom?
2. In the case that the heritage speakers' assembly of viewpoint aspectual features diverges from the baseline grammar, how is this divergence manifested?
3. What is the role of the input and language access in the acquisition of viewpoint aspect in the heritage speakers' grammars? Specifically, to what extent are measures of language access better at predicting heritage speakers' accuracy than measures of language input?

In order to achieve this goal and answer these questions, I adapted the *Cat Story* oral narrative retelling task and a bimodal semantic interpretation task from the Spanish Learner Language Oral Corpus (SPLLOC: Mitchell et al., 2008; Domínguez et al., 2013), which both focus on the expression of and interpretation of aspectual verb forms. I also used the Bilingual Language Experience Calculator (BiLEC: Unsworth, 2013) to measure various characteristics of the input environment the children are exposed to. Further details of the methodology and tasks can be found in the previous chapter.

In their Revised Feature Reassembly model, Putnam and Sánchez (2013) claim that measures of language activation will predict heritage speaker accuracy, and that cross-linguistic influence will affect heritage speakers' online performance more than their linguistic knowledge. Given the syntactic and semantic nature of viewpoint aspect in Arche's (2014) account, the assembly of viewpoint aspectual meaning onto specific verb forms in English and Spanish, and the nature of

Feature Reassembly (Lardiere, 2009; Domínguez, Arche & Myles, 2011), I make the following general predictions as to the acquisition of this linguistic phenomenon in Spanish heritage speakers' grammars.

Firstly, I expect that any divergence from the expected norms in the parents' or children's grammars will be observed in the association of habitual and continuous meaning to the Imperfect verb form, as this is where the English and Spanish grammars most differ from one another in the assembly of viewpoint aspect features. In line with Putnam and Sánchez's (2013) model, I predict that the production data will be more vulnerable to cross-linguistic influence from English than the comprehension data. Next, I would expect that divergence will primarily manifest through the use of the equivalent to the English verb form in these contexts. English uses the Simple Past to express habitual and continuous meaning, and thus heritage speakers of Spanish may use the Preterite in these contexts. However, the use of the Present at early stages of reassembly has been documented for L2 learners (e.g. Domínguez, Arche & Myles, 2017). As such, the use of the Present in lieu of the Imperfect may also reflect an ongoing process of feature reassembly, although this would not be incompatible with other feature-based interpretations, especially in the case that it affects the production without affecting the comprehension results, as per Putnam and Sánchez's model.

6.1.2 Structure of the chapter

In Section 6.2, I more fully describe the profile of the children in the study. In line with the theory and research questions, this focuses on the measures of input quantity, input quality and language activation measured through the BiLEC, and their proficiency in Spanish and English measured through their speech rate on an additional narrative retelling task, the *Loch Ness* story. I also consider other variables such as socio-economic status in this section.

After this, in Section 6.3 I present descriptive and analytical results of the *Cat Story* oral narrative retelling task and the bimodal semantic interpretation task. I examine accuracy rates within specific contexts, namely perfective, habitual, continuous, progressive, and imperfective. After the presentation of this descriptive data, I analyse differences in the production and comprehension of morphemes throughout the contexts tracked in the study. Some of this analysis is in the form of comparisons between the parents and the children, and in one case between sub-groups relating to regional variation. As detailed in Section 5.6 of the methodology, I carry out this analysis using Wilcoxon Rank sum tests. The remainder of the analysis consists of comparing rates of use of verb forms across different contexts within the same group, for which I used Wilcoxon Signed Rank tests.

In Section 6.4, I further analyse the children's data by examining the explanatory adequacy of various predictor variables. Where these variables entail categorical differences between the children, I carry out this analysis using Wilcoxon Rank sum tests. In the case that the predictor variables are continuous, I instead use Spearman's rank correlations to establish whether there is an association between the variables or not. Finally, I summarise the key findings of the study in Section 6.5.

6.2 Individual Participant Profiles

Using the questionnaire associated with Unsworth's (e.g. 2013) Bilingual Language Experience Calculator (BiLEC), and independent measures of proficiency in both Spanish and English, I have calculated a number of key variables that describe the individual children's language background. In view of its reported equivalence with other measures of proficiency in the field (Polinsky, 2008; Nagy & Brook, 2020), I have used speech rate as a proxy for proficiency in this study. The individual details are provided in Table 4.

Table 4: An overview of individual and categorical information about the heritage speakers.

Participant ID	Country of origin of parent(s)	Birth Order	UK Born	Age at time of arrival	Spanish-speaking parents	Mother's education level
MC01	Mexico	oldest	yes	N/A	1	Bachelor's
CC02	Colombia	oldest	no	2;00	1	Doctorate
SC03	Spain	oldest	yes	N/A	1	Doctorate
SC04	Spain	younger	yes	N/A	1	Doctorate
SC05	Spain	oldest	no	2;09	2	Doctorate
SC06	Spain	younger	no	1;05	2	Doctorate
MC07	Mexico	oldest	yes	N/A	1	Doctorate
MC08	Mexico	younger	yes	N/A	1	Doctorate
SC09	Spain	oldest	yes	N/A	2	Master's
SC10	Spain	oldest	yes	N/A	2	Doctorate
AC11	Argentina	oldest	yes	N/A	1	Master's
SC12	Spain	younger	no	0;01	2	Doctorate
SC13	Spain	younger	no	5;05	2	Doctorate
AC14	Argentina	oldest	no	0;05	1	Doctorate
AC15	Argentina	younger	yes	N/A	1	Doctorate
SC16	Spain	younger	yes	N/A	1	Master's
SC17	Spain	oldest	yes	N/A	1	Master's
SC18	Spain	younger	yes	N/A	1	Bachelor's
SC19	Spain	younger	yes	N/A	1	Bachelor's
MC20	Mexico	oldest	yes	N/A	2	Bachelor's
MC21	Mexico	younger	yes	N/A	2	Bachelor's
MC22	Mexico	younger	yes	N/A	2	Bachelor's
SC23	Spain	oldest	yes	N/A	1	Doctorate
SC24	Spain	younger	yes	N/A	1	Doctorate
AC25	Argentina	oldest	yes	N/A	1	Doctorate

Participant ID consists of three parts. The first letter signifies country of origin of the Spanish-speaking parent(s) in the family; the second letter signifies whether the participant was a parent or child; the number then signifies the participant number within that group. The first observation to make on the basis of Table 4 is that some of these categories have more equal numbers of children in than others. For example, six children were not born in the UK compared to 19 born in the UK, while 13 children are the oldest in their family, and 12 are younger children[13]. It is also clear that a slightly larger number of children come from Spain than from the Latin American countries combined.

Another interesting facet of these data is that the mother's education is relatively high in the group as a whole, with the majority of mothers having doctorates, and all mothers being university educated. Studies on language acquisition often use mother's education level as a proxy for socio-economic status (SES). In these terms, then, I would suggest that the group is relatively homogenous in terms of SES. As such, I will not include further analysis of the role of SES in this thesis, but it is worth highlighting that the group corresponds to Block's (2008) identified group of 'educated' or even 'assimilating' Spanish-speaking migrants in the British context, and as such only speaks to the experience of individuals in this group, rather than people from more precarious backgrounds.

Whilst I leave SES aside for the remainder of the analysis of the results due to this homogeneity, I do consider the impact of the remaining variables discussed in this section as a potential source of difference that may be observed within the heritage speaker group. Since there is no variation in the Preterite-Imperfect distinction in different Spanish-speaking varieties, I only refer to regional variation where it demonstrably has an effect on the results. As becomes clear below, regional variation is relevant for verb form choice in perfective contexts, which is slightly more complicated than an opposition between European and Latin American varieties (see Section 3.5). Conversely, the three categorical distinctions of whether the child was born inside or outside the UK, whether the child has one or two Spanish-speaking parents, and whether the child was the oldest in their family are consistently explored in the analysis.

Of more direct relevance to the research questions investigated in this thesis are the variables tracked in Table 5 and Table 6. Table 5 provides a summary of exposure and activation information, including two measures of input quantity—cumulative exposure and relative

[13] It is worth highlighting that three children were only children who are by definition the oldest in their family. In addition, in three families, other children did not take part due to age (oldest sibling of SC18 and SC19), complicated language backgrounds as heritage speaker returnees or specific language disorders (older siblings of SC12 and SC13), and adult children of the father's first marriage who do not live at home (half-siblings of CC02).

exposure, an implicit measures of language activation, namely the current relative output in Spanish, which measures how much Spanish the child uses relative to English, and a measure of input quality, namely richness of exposure to Spanish. Each of these variables was directly calculated using input to the BiLEC questionnaire, as detailed in Section 5.4.4.

Table 5: An overview of exposure and activation information about the heritage speakers.

Participant	Cumulative Exposure to Spanish (years)	Relative Exposure to Spanish (%)	Relative Output in Spanish (%)	Richness of Exposure to Spanish (%)
MC01	1.88	0.08	0.00	0.01
CC02	3.17	0.27	0.20	0.18
SC03	1.98	0.14	0.06	0.00
SC04	0.88	0.14	0.00	0.00
SC05	10.04	0.44	0.70	0.31
SC06	9.26	0.45	0.70	0.49
MC07	2.92	0.24	0.18	0.21
MC08	2.35	0.24	0.18	0.21
SC09	7.29	0.24	0.90	0.00
SC10	4.54	0.48	0.63	0.32
AC11	4.57	0.28	0.35	0.17
SC12	3.34	0.46	0.86	0.00
SC13	6.53	0.40	0.86	0.00
AC14	2.23	0.07	0.12	0.00
AC15	1.49	0.05	0.10	0.00
SC16	2.64	0.39	0.41	0.52
SC17	3.35	0.37	0.41	0.45
SC18	1.36	0.17	0.04	0.15
SC19	2.46	0.17	0.09	0.15
MC20	4.04	0.19	0.02	0.05
MC21	2.25	0.19	0.00	0.05
MC22	2.11	0.20	0.00	0.05
SC23	2.56	0.21	0.25	0.10
SC24	2.11	0.18	0.25	0.04
AC25	0.56	0.04	0.01	0.00
MEAN	**3.44**	**0.24**	**0.29**	**0.14**
RANGE	**0.56–10.04**	**0.04–0.48**	**0.00–0.90**	**0.00–0.52**
ST. DEV.	**2.39**	**0.13**	**0.30**	**0.16**

Table 6 covers participants' age and their English and Spanish proficiency measured by speech rate. Proficiency is also an implicit measure of language activation. Details on how each of these variables was calculated are given in Section 5.4.3. Children whose Spanish speech rate has been marked with the '~' symbol are ones whose recordings include interruptions that make calculating the speech rate more difficult.

Table 6: An overview of age and proficiency information about the heritage speakers.

Participant	Age at time of testing (years)	Spanish speech rate (wpm)	English speech rate (wpm)
MC01	11;06	~ 51.50	76.30
CC02	9;00	46.64	72.23
SC03	10;10	98.65	149.55
SC04	6;10	~9.62	107.30
SC05	15;06	155.35	155.63
SC06	14;02	145.58	145.16
MC07	10;01	73.17	88.20
MC08	8;00	45.80	68.70
SC09	11;03	94.65	103.14
SC10	7;05	120.18	111.66
AC11	11;02	72.94	108.80
SC12	5;06	63.46	62.69
SC13	10;10	110.34	111.66
AC14	12;11	71.89	99.45
AC15	9;05	15.26	104.61
SC16	6;00	65.79	96.01
SC17	10;01	74.16	87.44
SC18	7;00	~ 6.40	61.71
SC19	9;07	55.16	92.22
MC20	9;06	~ 68.92	104.09
MC21	7;05	~ 36.40	78.72
MC22	6;03	~ 35.30	69.48
SC23	14;08	110.38	117.80
SC24	12;07	58.83	88.44
AC25	12;09	64.68	162.90
MEAN	**10.01**	**70.04**	**100.96**
RANGE	**5;06–15;06**	**6.40–155.35**	**61.71–162.90**
ST. DEV.	**2.79**	**37.56**	**27.86**

In the cases of children whose Spanish recordings included interruptions that made calculating the speech rate more difficult, I have taken smaller samples within the recordings and used these to calculate estimated speech rates instead. Impressionistic comparison with children with similar characteristics in the group suggests that these approximations are generally accurate, further confirmation for which is shown by the strong correlations between these values for Spanish speech rate, and the value of relative output, another implicit measure of language activation, which are summarised in Table 7.

Table 7: Spearman's rank correlation coefficients between Spanish speech rate and other implicit measures of language activation.

Variable	S	r_s	p	
Relative Output to all Spanish speech rates	840.92	0.677	<0.001	***
Relative Output to non-estimated Spanish speech rates	558.72	0.510	0.026	*

For these correlation coefficients, the null hypothesis is that there is no association between the variables (H_0: $r_s = 0$). Since both coefficient values are significant, we have evidence that even

when we include the estimated values, there is an association between Spanish speech rate and the other implicit measures of language activation, which I would expect given that they are assumed to measure different facets of one construct. This evidence thus confirms the validity of using the estimated values in the analysis that follows.

6.3 Accuracy and usage rates within the narrative retelling task and semantic interpretation task

In this section, I present summaries of the data from the study, and subsequently I analyse differences in the verb forms used and accuracy rates. I mostly refer to group rates, noting individual details where necessary. The children's individual rates for both tasks are provided at the start of Section 6.4, before I conduct the correlation analyses. The individual rates for the parents are provided in Appendix F. I begin with an overview of performance in the production and comprehension tasks, and then I work systematically through the different relevant contexts, at which level I conduct the between-group and within-group comparisons that are relevant to establishing how viewpoint aspect is expressed in Spanish by both the heritage speakers and their parents. In each case, I start with the parents' data, and then consider the children's data.

6.3.1 Accuracy rates across all contexts in both tasks

In this section, I present a summary of the individual and group production rates for different morphemes in different contexts by the parents and then by the children. In all of the tables, the appropriate verb form in each context is marked in bold type. In the tables summarising the comprehension data, the accuracy percentage alone is given for accepting the appropriate and rejecting the inappropriate verb form in each context type. As with the production tables, the accuracy rates for the appropriate verb form in each context is marked in bold type.

As noted above, I begin with summaries of the parents' performance in the tasks. Table 8 shows the parents' individual usage of different contexts and verb forms within those contexts in the *Cat Story* narrative retelling task.

Table 8: The parents' use of different verb forms in different contexts in the production task. For each context, the appropriate form is highlighted in bold.

Context	Preterite (%)	Imperfect (%)	Present (%)	Other (%)	Total tokens
Perfective	**249 (0.97)**	5 (0.02)	3 (0.01)	0 (0.00)	257
Habitual	0 (0.00)	**155 (0.99)**	1 (0.01)	0 (0.00)	156
Continuous	0 (0.00)	**74 (0.96)**	3 (0.04)	0 (0.00)	77
Progressive	0 (0.00)	**26 (1.00)**	0 (0.00)	0 (0.00)	26

As can be seen from the table, the parents almost always use the appropriate form in each context, with a small number of unexpected forms being used. In perfective contexts, this manifests as both the use of the Imperfect and the Present in lieu of the Preterite. In habitual and continuous contexts, only the Present is used instead of the Imperfect. All progressive contexts included appropriate use of the Imperfect or a compound progressive form. As such, it is clear that the parents are highly accurate at using the appropriate form in the appropriate context, performing at or near ceiling in all contexts. Of 506 tokens, only 12 forms were inappropriate: six uses of the Imperfect and two uses of the Present in perfective contexts, one use of the Present in habitual contexts, and three uses of the Present in continuous contexts. As such, there is no evidence of systematic divergence from expected norms in the parents' production data. In Table 9, I summarise the parents' accuracy at accepting the appropriate morpheme and rejecting the inappropriate morpheme in each context in the semantic interpretation task.

Table 9: The parents' accuracy in the different contexts in the semantic interpretation task. For each context, appropriate acceptance of a form is marked in bold and underlined, whilst appropriate rejection of a form is in plain text.

Context	**Preterite (%)**	**Imperfect (%)**
Perfective	**96**	94
Habitual	82	**87**
Continuous	87	**95**
Progressive	96	**89**

Given that there are only three items for each of the imperfective readings, an accuracy rate of 67% in the habitual, continuous, and progressive contexts for this task represents acceptance of an inappropriate morpheme or rejection of an appropriate morpheme in just one context. Consequently, although the overall accuracy rates for these contexts look lower than expected, the average ratings for the parents' overall accuracy is substantially high given the number of items. This indicates that the majority of the parents either rated all items as expected or rated one item only unexpectedly. There are four contexts where the group accuracy rate is lower than 90%, and so I shall briefly consider whether there is any evidence that specific items were especially problematic in each of these contexts. Domínguez, Arche and Myles (2017: fn. 17) observed that one of their items was appropriately rejected by only half of the monolingual speakers in their study and another one by only 60%, so I shall review whether any of the items here exhibit the same level of unexpected responses.

The average accuracy at rejecting the Preterite in continuous contexts was 87%. In total, parents accepted the Preterite five times, each with the item 'Raquel la ratona tuvo frío' (Raquel the mouse was cold), and one parent did not rate the item 'el horno estuvo caliente' (the oven was hot). In sum, then, almost one third of the parents accepted the Preterite in the 'tuvo frío'

context, although none of these rejected the Imperfect in this context. Three of these parents were from Spain, and two from Mexico, so this is unlikely to reflect regional variation. As such, it is plausible that the context was slightly more ambiguous than expected, although the fact that around 70% of the parents from both Peninsular and Latin American varieties appropriately rejected the Preterite in this context suggests that this is unlikely.

Likewise, the Imperfect was only accepted by parents in 89% of progressive contexts, with five inappropriate rejections of the Imperfect. Three of these were with the item 'mientras Eduardo el elefante bebía la botella' (while Eduardo the elephant drank the bottle), and the remaining two with the item 'mientras Anita la abeja hacía galletas' (while Anita the bee made cookies). The presence of the adverbial 'mientras' (while) heavily signifies that this is a progressive context and thus that the Imperfect is appropriate, so it is unclear why these ones were rejected. It is noticeable that one individual rejected both items, and thus her unexpected behaviour with these items had a disproportionate impact on the overall group results. In either case, these items were overwhelmingly accepted by the majority of the parents, and as such there is no case that the items caused this low rate in the progressive contexts.

Finally, the acceptance of the Imperfect and rejection of the Preterite were both lower in habitual contexts, at 87% and 82% respectively. In the case of accepting the Imperfect, five items were inappropriately rejected, three with the item 'de niño, Eduardo el elefante bebía mucha agua' (as a child, Eduardo the elephant drank a lot of water) and two with the item 'cada primavera, Carlos el cerdo pintaba la pared de azul' (every spring, Carlos the pig painted the wall blue). This 'pintaba la pared' item was also left unrated by one parent. As with the progressive contexts, this small number of unexpected rejections of the Imperfect for each item is unlikely to represent an issue with the items. The Preterite was inappropriately accepted four times with the item 'de niño, Eduardo el elefante bebió mucha agua' (as a child, Eduardo the elephant drank a lot of water), which was also unrated by one parent, twice with the item 'cada primavera, Carlos el cerdo pintó la pared de azul' (every spring, Carlos the pig painted the wall blue), and once with the item 'Olivia la oveja leyó a los niños' (Olivia the ewe read to the children). As such, it is clear that the items with 'beber mucha agua' were more problematic than the other habitual items, but whilst this is the case for some parents, the majority still appropriately accepted the Imperfect and rejected the Preterite in these contexts. I reviewed whether removing these items would lead to more expected accuracy ratings. Doing so yields an accuracy rating of 90% for both accepting the Imperfect and rejecting the Preterite in habitual contexts. Whilst this represents a marginal

improvement for the acceptance of the Imperfect, it is a substantial increase for the Preterite. However, the change in accuracy rate is not statistically significant[14].

As such, there is no evidence of items causing specific patterns of unexpected behaviour in the parental group. The results are comparable to the results obtained by Domínguez, Arche and Myles (2017) for monolingual Spanish speakers, and as such these results are indicative of no representational change in the parents' grammars or item-based effects. For either of these, I would expect to see more consistent patterns of non-target-like behaviour.

I now present descriptive data about the children's performance in the production and comprehension tasks. Five children produced no contexts that could appropriately be classified as any of the four context types under investigation, either due to parental structuring of their responses, consistent use of the Present for the narrative, or no production of verb phrases at all in the recording. The remaining children produced at least one context that was unambiguously perfective, habitual, continuous or progressive. Nineteen children produced perfective contexts, sixteen children produced habitual contexts, nineteen children produced continuous contexts, and fourteen children produced progressive contexts. Table 10 provides the usage rates for each morpheme in each context of the children in the production task.

Table 10: The children's usage of different verb forms in different contexts in the narrative retelling task. For each context, the appropriate form is marked in bold.

Context	Preterite (%)	Imperfect (%)	Present (%)	Other (%)	Total tokens
Perfective	**136 (0.66)**	13 (0.06)	13 (0.06)	44 (0.21)	206
Habitual	12 (0.09)	**69 (0.54)**	25 (0.20)	22 (0.17)	128
Continuous	5 (0.03)	**116 (0.77)**	29 (0.20)	0 (0.00)	150
Progressive	0 (0.00)	**30 (1.00)**	0 (0.00)	0 (0.00)	30

It is immediately clear that the children are far more varied in the forms that they use than their parents are. Whilst some children are consistently highly accurate across the board, others show far greater variability across the contexts, with the perfective and habitual contexts being especially more variable than the continuous contexts, which are in turn slightly more variable than the progressive contexts, for which all children appropriately used imperfective forms. As such, these results suggest that the progressive and continuous readings are the least difficult for the children, followed by perfective and habitual readings. Recall that under Feature Reassembly I predicted that the habitual and continuous would be the most vulnerable in the children's grammars. As such, this result is contra Feature Reassembly, as the children are less accurate in perfective contexts than in continuous contexts.

[14] Wilcoxon rank sum test: W = 687.5, p = 0.6725, r_{rb} = 0.361.

However, there was one unexpected pattern of behaviour in this group, as a large number of the 'other' verb forms produced in perfective and habitual contexts were the Present Perfect. This behaviour was uniquely done by children with parents from regions of Spain and Latin America in which the use of the Present Perfect has extended into contexts in which the use of the Preterite is canonical (see Howe & Schwenter, 2003), and as such is likely to constitute a greater amount of 'perfective' input for these children than the Preterite[15]. Figure 14 provides an example of a perfective context from the *Cat Story*, followed by extracts from two children in the same family where the mother comes from southern Spain.

Figure 14: The prompt being described by SC23 and SC24 in the extracts below.

SC23: y pues **se fue** PRETERITE a una casa que tenía un perro super grande
and then he went to a house which had a very big dog

SC24: pero su gato **se ha ido--venido** PRESENT PERFECT a un casa con un perro super grande
but her cat has gone--come to a house with a very big dog

Even within the same family, SC23 consistently used the Preterite to describe perfective contexts, while SC24 consistently used the Present Perfect to describe perfective contexts, but neither child used either of these forms for any other purpose than to express perfective meaning[16]. As such, it could be argued that this form is being used as a general perfective marker by some of the children in this group. If this is the case, then these children are appropriately associating a perfective form with perfective meaning on the basis of the input. The group accuracy rates in this case are given in Table 11.

[15] To my knowledge, there is no analysis of child-directed speech in L1 acquisition that clearly establishes what proportion of the input typically expresses recent and distant past.
[16] Neither SC23 nor SC24 used the Present Perfect to express perfect aspectual meaning, although some children and parents did. I consistently separated perfect and perfective aspectual contexts, and only consider perfective uses of the Present Perfect in this analysis.

Table 11: The children's usage of different verb forms in different contexts in the narrative retelling task counting the Present Perfect as a perfective marker. For each context, the appropriate form is marked in bold.

Context	*Perfective* (%)	Imperfect (%)	Present (%)	Other (%)	Total tokens
Perfective	**171 (0.83)**	13 (0.06)	13 (0.06)	9 (0.04)	206
Habitual	21 (0.16)	**69 (0.54)**	25 (0.20)	13 (0.10)	128
Continuous	5 (0.03)	**116 (0.77)**	29 (0.20)	0 (0.00)	150
Progressive	0 (0.00)	**30 (1.00)**	0 (0.00)	0 (0.00)	30

Working on the assumption that the Present Perfect is being used as a perfective marker, we see that the children's accuracy in perfective contexts increases from 66% for the Preterite alone to 83%. Likewise, the incidence of use of the Preterite in lieu of the Imperfect in habitual contexts increases from 9% to 16%. This accuracy rate suggests that the children are most target-like with respect to the baseline in progressive and perfective contexts, followed by continuous and habitual contexts, which is in line with Feature Reassembly.

Another key fact that is relatively salient is that the Present is more likely to be used in lieu of the Imperfect in habitual and continuous contexts. Recall that under Feature Reassembly, I would expect the Preterite to be the morpheme used, in lieu of the Imperfect, although the use of the Present is not entirely contra the hypothesis. I return to this topic in the next chapter. For now, Table 12 summarises the children's accuracy in the semantic interpretation task.

Table 12: The children's accuracy in the different contexts in the semantic interpretation task. For each context, acceptance is marked in bold and underlined, whilst rejection is in plain text.

Context	Preterite (%)	Imperfect (%)
Perfective	**76**	64
Habitual	63	**71**
Continuous	51	**72**
Progressive	62	**75**

Three points are immediately clear from this data. Firstly, the children's responses are more varied than their parents, and the group average is thus substantially lower than the parents' in all contexts. Second, the children are consistently more accurate at accepting the appropriate morpheme than rejecting the inappropriate morpheme in all of the context types. This behaviour is especially clear in continuous contexts, for which the accuracy at rejecting the Preterite is substantially lower than for the other contexts. This hesitancy at rejecting the inappropriate verb form has been widely discussed in the heritage speaker literature (e.g. Polinsky & Scontras, 2020), and is a known property of child judgments of linguistic data (Ambridge & Rowland, 2013). On the surface, then, the children's generally lower accuracy at rejecting the inappropriate morpheme in all of the contexts can be explained by appeal to these two points. However, their comparatively

lower rates at rejecting the Preterite in continuous contexts points to a specific additional difficulty in mapping the Imperfect to this context, which is consistent with the predictions of the Feature Reassembly Hypothesis (Lardiere, 2009). The third main takeaway from the overall figures is how consistent the ratings are across the different contexts, the rejection of the Preterite in continuous contexts excepted. Whilst the acceptance of the Preterite in perfective contexts and the Imperfect in progressive contexts is slightly higher than the acceptance of the Imperfect in habitual and continuous contexts, which would be expected under Feature Reassembly. Given the lower accuracy seen in the habitual and continuous contexts in the production data, I could infer that the robust acceptance of the appropriate forms in the comprehension task is consistent with Putnam and Sánchez's (2013) claim that production will be more vulnerable than grammatical representations for heritage speakers.

However, this needs to be established through the use of statistical tests. I turn to these now. I start by focusing on the context types in turn, first perfective, then habitual, continuous, progressive and finally imperfective overall. After this, I provide some additional relevant comparisons. In the interests of expositional brevity, I have not reported the test statistic of every possible comparison here; in some cases, I merely note non-difference where this obtains.

6.3.2 Verb forms in perfective contexts

Before advancing to statistical tests, I provide a brief review of the usage of verb forms by the children and parents in perfective contexts. In this table, I first provide the raw total number for each verb form, including its proportion of the group responses. Then, I provide the following descriptive statistics calculated from individual usage rates: mean and standard deviation, median, and range.

This summary of results is given in Table 13. Impressionistically, it is clear that the children differ from their parents in the use of the Present Perfect in perfective contexts, and the commensurate reduction in their use of the Preterite. Otherwise, their use of the alternative verb forms in descriptively similar.

Table 13: A descriptive summary of group performance in perfective contexts in the production task

	Children				Parents			
	Tokens (%)	**Mean (SD)**	**Median**	**Range**	**Tokens (%)**	**Mean (SD)**	**Median**	**Range**
Preterite	136 (66%)	0.66 (0.39)	0.83	0.00–1.00	249 (95%)	0.95 (0.08)	0.96	0.67–1.00
Present Perfect	35 (17%)	0.20 (0.37)	0.00	0.00–1.00	-	-	-	-
Total Perfectives	171 (83%)	0.87 (0.20)	1.00	0.33–1.00	249 (95%)	0.95 (0.08)	0.96	0.67–1.00
Imperfect	13 (6%)	0.04 (0.07)	0.00	0.00–0.23	5 (2%)	0.02 (0.03)	0.00	0.00–0.08
Present	13 (6%)	0.04 (0.10)	0.00	0.00–0.30	8 (3%)	0.04 (0.10)	0.00	0.00–0.33
Other	9 (4%)	0.05 (0.16)	0.00	0.00–0.67	-	-	-	-

Wilcoxon rank sum tests show that the children are indeed different from their parents in using the Present Perfect in perfective contexts ($W = 195$, $p = 0.011$, $r_{rb} = 0.368$), but the difference was not statistically significant for the Preterite ($W = 99$, $p = 0.125$, $r_{rb} = -0.305$). Likewise, the children's use of both perfective forms ($W = 141$, $p = 0.971$, $r_{rb} = -0.011$), the Imperfect ($W = 150.5$, $p = 0.754$, $r_{rb} = 0.056$), the Present ($W = 130$, $p = 0.556$, $r_{rb} = -0.088$) and 'other' verb forms ($W = 165$, $p = 0.121$, $r_{rb} = 0.158$) was not statistically different from their parents'. As such, the results show that the children are different from the parents in perfective contexts, but only with respect to using the Present Perfect.

Wilcoxon signed rank tests also show that the parents consistently used the Preterite more than the Imperfect or Present (in both cases: $V = 120$, $p < 0.001$, $r_{mrb} = 1.000$), but were statistically equally likely to have used the Present or Imperfect ($V = 19$, $p = 0.722$, $r_{mrb} = 0.156$). The children were also statistically more likely to use the Preterite than the Present Perfect ($V = 147$, $p = 0.036$, $r_{mrb} = 0.719$), Imperfect ($V = 150$, $p < 0.001$, $r_{mrb} = 0.961$), Present ($V = 136$, $p < 0.001$, $r_{mrb} = 1.000$), and 'other' verb forms ($V = 133$, $p < 0.001$, $r_{mrb} = 0.956$). Their use of the Present Perfect was not statistically greater than their use of the Imperfect ($V = 43$, $p = 0.126$, $r_{mrb} = 0.564$), the Present ($V = 40$, $p = 0.221$, $r_{mrb} = 0.455$), or 'other' verb forms ($V = 34.5$, $p = 0.172$, $r_{mrb} = 0.533$). Likewise, the children were equally likely to use the Imperfect as the Present ($V = 15$, $p = 0.933$, $r_{mrb} = 0.071$) and 'other' verb forms ($V = 12$, $p = 0.834$, $r_{mrb} = 0.143$), and the Present as 'other' verb forms ($V = 11$, $p = 1.000$, $r_{mrb} = 0.048$). Given that the usage rate for both perfectives forms is derived from the sum of the uses of Preterite and Present Perfect, it is statistically higher than both, as Wilcoxon signed rank tests exclude cases where participants had the same percentage for both;

as such, I do not report the test statistics here. Likewise, the use of both perfective forms was statistically higher than the use of the non-perfective forms, but since this was already established through the comparison to the Preterite alone, I do not report these numbers here either.

As such, the children as a group were not generally distinguishable from their parents in their use of verb forms in perfective contexts, with the exception of the substantial use of the Present Perfect by a small number of children. Even so, some children did not associate perfective meaning with the Preterite or Present Perfect verb form. I return to consider which variables help us to understand the heritage speakers' accuracy and usage of inappropriate verb forms in Section 6.4.

I have already established that only children who had a parent whose variety of Spanish allows extension of the Present Perfect into recent perfective contexts used the Present Perfect in the distant perfective contexts of the *Cat Story*. In view of this difference between groups of children, as well as the variability within the group whose input is an extending variety, it is appropriate to establish whether the two groups are statistically different from one another in the use of this form. Table 14 and Table 15 summarise the performance of the children and parents in the extending and non-extending varieties, respectively.

Table 14: A descriptive summary of performance in perfective contexts in the production task by participants in the extending variety group

	Extending variety children (*n* = 11)				**Extending variety parents (*n* = 10)**			
	Tokens (%)	**Mean (SD)**	**Median**	**Range**	**Tokens (%)**	**Mean (SD)**	**Median**	**Range**
Preterite	78 (58%)	0.55 (0.44)	0.56	0.00–1.00	170 (96%)	0.94 (0.10)	0.96	0.67–1.00
Present Perfect	35 (26%)	0.35 (0.43)	0.13	0.00–1.00	-	-	-	-
Total Perfectives	*113 (84%)*	*0.90 (0.17)*	*1.00*	*0.50–1.00*	*170 (96%)*	*0.94 (0.10)*	*0.96*	*0.67–1.00*
Imperfect	11 (8%)	0.06 (0.09)	0.00	0.00–0.23	4 (2%)	0.02 (0.03)	0.00	0.00–0.08
Present	6 (4%)	0.02 (0.08)	0.00	0.00–0.27	3 (2%)	0.04 (0.10)	0.00	0.00–0.33
Other	4 (3%)	0.02 (0.08)	0.00	0.00–0.25	-	-	-	-

Table 15: A descriptive summary of performance in perfective contexts in the production task by participants in the non-extending variety group

	Non-extending variety children (*n* = 8)				**Non-extending variety parents (*n* = 6)**			
	Tokens (%)	**Mean (SD)**	**Median**	**Range**	**Tokens (%)**	**Mean (SD)**	**Median**	**Range**
Preterite	58 (81%)	0.83 (0.24)	0.92	0.33–1.00	79 (93%)	0.99 (0.03)	1.00	0.93–1.00
Present Perfect	-	-	-	-	-	-	-	-
Perfectives	*58 (81%)*	*0.83 (0.24)*	*0.92*	*0.33–1.00*	*79 (93%)*	*0.99 (0.03)*	*1.00*	*0.93–1.00*
Imperfect	2 (3%)	0.02 (0.03)	0.00	0.00–0.08	1 (1%)	0.01 (0.03)	0.00	0.00–0.07
Present	7 (10%)	0.06 (0.12)	0.00	0.00–0.30	5 (6%)	0.04 (0.09)	0.00	0.00–0.20
Other	5 (7%)	0.09 (0.23)	0.00	0.00–0.67	-	-	-	-

Wilcoxon rank sum tests confirm the overall picture, with neither the extending nor non-extending variety children differing from the parents in their use of the Preterite (extending: $W = 33.5$, $p = 0.134$, $r_{rb} = 0.391$; non-extending: $W = 15$, $p = 0.474$, $r_{rb} = 0.250$), or indeed from each other ($W = 28$, $p = 0.189$, $r_{rb} = 0.364$).[17] For the use of the Present Perfect, the extending variety children are statistically different both from their parents ($W = 90$, $p = 0.004$, $r_{rb} = 0.636$) and the non-extending variety children ($W = 72$, $p = 0.009$, $r_{rb} = 0.636$). As with the overall rates, the children in neither group differed from each other or their parents with respect to the other morphemes, and as such I do not report the statistical tests here.

Children in the extending variety group were statistically more likely to use the Preterite than the Imperfect ($V = 42$, $p = 0.024$, $r_{mrb} = 0.867$), the Present ($V = 36$, $p = 0.014$, $r_{mrb} = 1.000$), and 'other' verb forms ($V = 36$, $p = 0.014$, $r_{mrb} = 1.000$). However, their use of the Present Perfect was not statistically different from their use of the Preterite ($V = 40$, $p = 0.559$, $r_{mrb} = 0.212$). Despite the substantial difference in mean and median use of each of these forms, the ranges showed that the children's use of the two forms is relatively evenly distributed, and as such this is not surprising. This finding is not central to the research questions under investigation, but it does show that many of the children in this group are extending the change in the use of perfective

[17] It is worth highlighting that Wilcoxon tests rely on distributions of participants, so although the central tendencies of the extending variety children is substantially lower than their parents and the other children, the ranges and distribution of children across that range is more relevant for the test.

verb forms, as Silva-Corvalán (1994) observed with other linguistic properties for speakers of Mexican origin in Los Angeles. Their use of the Present Perfect was not statistically higher than their use of the Imperfect ($V = 32$, $p = 0.058$, $r_{mrb} = 0.778$), the Present ($V = 32$, $p = 0.058$, $r_{mrb} = 0.778$), or 'other' verb forms ($V = 26$, $p = 0.051$, $r_{mrb} = 0.857$). That said, in each of these cases the difference was trending towards significance, and the children were consistently more likely to have used the Present Perfect than the other verb forms. As with the whole group, the children in this sub-group were equally likely to have used the Imperfect, Present, or 'other' verb forms in perfective contexts.

The children in the non-extending variety group's behaviour was similar to the children as a whole group; they were statistically more likely to have used the Preterite than the Imperfect ($V = 36$, $p = 0.013$, $r_{mrb} = 1.000$), the Present ($V = 36$, $p = 0.013$, $r_{mrb} = 1.000$), and 'other' verb forms ($V = 35$, $p = 0.019$, $r_{mrb} = 0.944$). As with the whole group, the children in this sub-group were equally likely to have used the Imperfect, Present, or 'other' verb forms in perfective contexts. None of the pairwise comparisons between the two groups of parents showed a difference in their use of any of the verb forms; the two groups were least similar to each other in the use of the Imperfect ($W = 29$, $p = 0.609$, $r_{rb} = 0.160$).

In sum, then, there is substantial evidence from the production task that the children mostly associate perfectivity with an appropriate perfective form, for a sub-group of whom the use of the Present Perfect in perfective contexts appears to be the extension of a grammatical change that is taking place in the baseline grammar. Generally high accuracy in perfective contexts is consistent with the Feature Reassembly hypothesis, due to the cross-linguistic similarity in form-meaning mappings to perfectivity in both English and Spanish. I now consider the results of the semantic interpretation task, which are summarised in Table 16.

Table 16: A descriptive summary of accuracy in perfective contexts in the semantic interpretation task

Accuracy rates for:	**Children**			**Parents**		
	Mean (SD)	**Median**	**Range**	**Mean (SD)**	**Median**	**Range**
Accepting the Preterite	0.76 (0.19)	0.78	0.40–1.00	0.96 (0.07)	1.00	0.78–1.00
Rejecting the Imperfect	0.62 (0.27)	0.56	0.00–1.00	0.94 (0.09)	1.00	0.67–1.00

Wilcoxon rank sum tests show that the children are statistically less likely to accept the Preterite ($W = 76.5$, $p < 0.001$, $r_{rb} = -0.618$) and to reject the Imperfect ($W = 56$, $p < 0.001$, $r_{rb} = -0.720$) than their parents. Within the groups, the parents were equally accurate at accepting the Preterite and

rejecting the Imperfect (V = 11, p = 0.410, r_{mrb} = 0.467), whilst the children were statistically more likely to accept the Preterite than reject the Imperfect (V = 92, p = 0.014, r_{mrb} = 0.752).

As such, there is substantial evidence that the children are less accurate than their parents at both accepting the Preterite and rejecting the Imperfect in perfective contexts. This is in spite of the fact that the children were not statistically different from their parents in the use of the Preterite in perfective contexts in the production task. The other facet of these data confirms that the children are statistically more likely to accept the appropriate morpheme than reject the inappropriate morpheme. As already highlighted, this can be linked to heritage speakers' widely observed hesitancy to reject inappropriate items (Polinsky & Scontras, 2020), as well as a similar tendency that has been observed with children in general (Ambridge & Rowland, 2013).

In view of the difference in children's behaviour in the production task due to the variety of Spanish spoken by their baseline, manifesting in increased use of the Present Perfect, I also investigated the children's performance in the semantic interpretation task according to whether the baseline variety had extended the Present Perfect into perfective contexts or not. The ratings are summarised in Table 17 and Table 18.

Table 17: A descriptive summary of accuracy in perfective contexts in the semantic interpretation task by participants in the extending variety group

Accuracy rates for:	**Children**			**Parents**		
	Mean (SD)	**Median**	**Range**	**Mean (SD)**	**Median**	**Range**
Accepting the Preterite	0.77 (0.16)	0.78	0.44–1.00	0.96 (0.08)	1.00	0.78–1.00
Rejecting the Imperfect	0.58 (0.29)	0.56	0.00–1.00	0.97 (0.05)	1.00	0.89–1.00

Table 18: A descriptive summary of accuracy in perfective contexts in the semantic interpretation task by participants in the non-extending variety group

Accuracy rates for:	**Children**			**Parents**		
	Mean (SD)	**Median**	**Range**	**Mean (SD)**	**Median**	**Range**
Accepting the Preterite	0.75 (0.25)	0.78	0.40–1.00	0.96 (0.06)	1.00	0.89–1.00
Rejecting the Imperfect	0.68 (0.25)	0.61	0.40–1.00	0.91 (0.13)	0.94	0.67–1.00

In terms of acceptance of the Preterite, Wilcoxon rank sum tests reveal that the children in the extending variety group differ from their parents (W = 22.5, p = 0.003, r_{rb} = −0.700), but the children in the non-extending variety are not statistically different from their parents (W = 16, p = 0.117, r_{rb} = −0.467). By contrast, the children from the extending variety group are not

different from the children in the non-extending variety group (W = 76.5, p = 0.955, r_{rb} = 0.020), and nor are the two groups of parents significantly different from one another (W = 30, p = 1.000, r_{rb} = 0). As for rejection of the Preterite, the same pattern holds; the children in the extending variety group are different from their parents (W = 9.5, p < 0.001, r_{rb} = 0.873), whereas the children in the non-extending variety group are not different from their parents (W = 15, p = 0.106, r_{rb} = 0.500). Again, the two groups of children are not statistically different from one another (W = 63, p = 0.521, r_{rb} = 0.160), nor are the two groups of parents (W = 37.5, p = 0.374, r_{rb} = 0.250).

There are two potential sources for these patterns of behaviour, especially the fact that the groups of children differ with respect to whether their ratings are statistically different from the baseline. The first of these is the small number of participants in the sub-groups. It is also possible that some of the extending variety children did not reject either of the forms they were presented with because they would have preferred to accept a sentence that used the Present Perfect in the context.

In sum, the results of the perfective contexts show that the parents and children do not differ from each other in the production task with the exception of the use of the Present Perfect by a substantial sub-group of the children. However, the children were less accurate at both accepting the Preterite and rejecting the Imperfect in the semantic interpretation task than their parents. The children were also more likely to accept the Preterite than to reject the Imperfect, although this is likely explained by age and bilingualism effects.

6.3.3 Verb forms in habitual contexts

In this section, I focus on the use of different verb forms in habitual contexts in the narrative retelling task and accuracy at accepting the Imperfect and rejecting the Preterite in habitual contexts in the semantic interpretation task. As the extension of the Present Perfect in certain varieties was only relevant for perfective contexts, I do not report any results in terms of the sub-groups for any of the imperfective contexts. However, I have counted the use of the Present Perfect by one child in the extending variety group as use of the 'Preterite' here. Table 19 summarises the use of different verb forms in habitual contexts in the narrative retelling task.

Table 19: A descriptive summary of group performance in habitual contexts in the production task

	Children				Parents			
	Tokens (%)	**Mean (SD)**	**Median**	**Range**	**Tokens (%)**	**Mean (SD)**	**Median**	**Range**
Imperfect	69 (54%)	0.51 (0.41)	0.50	0.00–1.00	155 (99%)	0.99 (0.03)	1.00	0.89–1.00
Preterite	20 (16%)	0.13 (0.25)	0.00	0.00–0.75	-	-	-	-
Present	26 (20%)	0.23 (0.33)	0.09	0.00–1.00	1 (1%)	0.01 (0.03)	0.00	0.00–0.11
Other	13 (10%)	0.12 (0.21)	0.00	0.00–0.67	-	-	-	-

It is impressionistically clear that the children are quite different from their parents in the use of different verb forms in habitual contexts. This is confirmed by the use of Wilcoxon rank sum tests; the Parents are statistically more likely to use the Imperfect ($W = 198$, $p < 0.001$, $r_{rb} = 0.792$), but statistically less likely to use the Preterite ($W = 78$, $p = 0.039$, $r_{rb} = -0.294$), Present ($W = 45$, $p = 0.002$, $r_{rb} = -0.593$) or 'other' verb forms than the children. As such, I conclude that the children diverge from their parents with respect to the use of verb forms in habitual contexts.

Wilcoxon signed rank tests show that the Parents used the Imperfect statistically more than the Preterite, Present or 'other' verb forms (for all three: $V = 91$, $p < 0.001$, $r_{mrb} = 1.000$), however there was no evidence that they used the Present more than they used the Preterite or 'other' verb forms (for both: $V = 1$, $p = 1.000$, $r_{mrb} = 1.000$). By contrast, although the children used the Imperfect more than they used the Preterite ($V = 81$, $p = 0.014$, $r_{mrb} = 0.543$) or 'other' verb forms ($V = 91$, $p = 0.017$, $r_{mrb} = 0.733$), their use of the Present, although less frequent than their use of the Imperfect, was not statistically different to it ($V = 97$, $p = 0.139$, $r_{mrb} = 0.426$). Meanwhile, the children were not more likely to use the Present than the Preterite ($V = 32.5$, $p = 0.382$, $r_{mrb} = 0.286$) or 'other' verb forms ($V = 42$, $p = 0.449$, $r_{mrb} = 0.273$), and were equally likely to use the Preterite as 'other' verb forms ($V = 23$, $p = 1.000$, $r_{mrb} = 0.022$).

In sum, then, the use of verb forms in habitual contexts shows that many of the children struggle to associate the Imperfect with the expression of habitual meaning. The vulnerability of habitual contexts is predicted in a Feature Reassembly account (Lardiere, 2009; Putnam & Sánchez, 2013), as it is one of the areas in which the English and Spanish form-meaning mappings diverge from one another. However, under Feature Reassembly we would typically expect the difficulty to manifest as increased use of the Preterite in these contexts. Whilst its use is not negligible, the children most often substitute the Present for the Imperfect in habitual contexts.

In Table 20, I summarise the children and parents' performance in habitual contexts in the semantic interpretation task.

Table 20: A descriptive summary of accuracy in habitual contexts in the semantic interpretation task

Accuracy rates for:	Children			Parents		
	Mean (SD)	Median	Range	Mean (SD)	Median	Range
Accepting the Imperfect	0.72 (0.26)	0.67	0.33–1.00	0.87 (0.17)	1.00	0.67–1.00
Rejecting the Preterite	0.59 (0.38)	0.67	0.00–1.00	0.82	1.00	0.33–1.00

As discussed in Section 6.3.1, the parents' accuracy rates for items in habitual contexts in the semantic interpretation task were slightly lower than would have been expected. Even so, they were comparable with the results obtained by Domínguez, Arche and Myles (2017) for their monolingual control group on a similar task, and indeed the items in this study were treated slightly less unexpectedly by the parents in the baseline group than by the controls in that study.

Nonetheless, Wilcoxon rank sum tests show that the children and parents do not differ from one another at either accepting the Imperfect (W = 226.5, p = 0.082, r_{rb} = 0.313) or rejecting the Preterite (W = 230, p = 0.070, r_{rb} = 0.333), although both of these differences were trending towards significance. Signed rank tests show that neither the parents (V = 8, p = 0.345, r_{rb} = 0.600) nor the children (V = 37, p = 0.091, r_{rb} = 0.644) were statistically more or less likely to accept the Imperfect or reject the Preterite in habitual contexts, although this difference was trending towards significance for the children. In both cases, the relatively large rank biserial correlation suggests that this non-difference may be an artefact of the small number of items in the condition affecting variability in accuracy.

Although its interpretation is a little difficult due to the parents' somewhat unexpected lower accuracy with items in habitual contexts, the evidence from the semantic interpretation task suggests that the children's association of the Imperfect to habituality at the representational level is, broadly speaking, appropriate. Part of this is seen in the fact that the children are not statistically distinguishable from their parents in habitual contexts. Furthermore, their acceptance of the Imperfect in habitual contexts is not statistically different from their acceptance of the Preterite in perfective contexts (V = 120, p = 0.584, r_{mrb} = 0.263), and nor is their rejection of the Preterite in habitual contexts statistically different from their rejection of the Imperfect in perfective contexts (V = 87.5, p = 0.948, r_{mrb} = 0.023). This finding thus provides tentative confirmation of Putnam and Sánchez's (2013) claim that production is more vulnerable than comprehension. As with the perfective contexts, it is however noticeable that a substantial

number of children were less accurate than chance in their rating of the two sentences in habitual contexts. Of 23 children who rated habitual items, five only accepted one of the Imperfect items, whereas eleven accepted at least two of the Preterite items. In Section 6.4, I examine whether any of the predictor variables are associated with the children's performance.

In sum, the data from the habitual contexts shows that the children typically have substantial difficulty associating the Imperfect with habitual meaning. In the *Cat Story* production task, they produced high numbers of both Preterite and Present verb forms in lieu of the Imperfect. In the semantic interpretation task, however, they were more similar to their parents, in line with Putnam and Sánchez's model.

6.3.4 Verb forms in continuous contexts

The next type of context investigated in this study are those associated with the continuous reading of the Imperfect. This is another context in which Feature Reassembly predicts greater difficulty. The use of different verb forms in continuous contexts in the *Cat Story* narrative retelling task is summarised in Table 21.

Table 21: A descriptive summary of group performance in continuous contexts in the production task

	Children				Parents			
	Tokens (%)	**Mean (SD)**	**Median**	**Range**	**Tokens (%)**	**Mean (SD)**	**Median**	**Range**
Imperfect	116 (76%)	0.76 (0.34)	0.90	0.00–1.00	74 (96%)	0.96 (0.08)	1.00	0.75–1.00
Preterite	5 (3%)	0.03 (0.11)	0.00	0.00–0.50	-	-	-	-
Present	31 (20%)	0.21 (0.31)	0.10	0.00–1.00	3 (4%)	0.04 (0.08)	0.00	0.00–0.25

As with the habitual contexts, we again see that the children produce fewer Imperfect tokens in continuous contexts than their parents do, and again that the Present is the main form the children use in lieu of the Imperfect. Wilcoxon rank sum tests confirm that the children are statistically less likely to use the Imperfect ($W = 192$, $p = 0.020$, $r_{rb} = -0.444$) and statistically more likely to use the Present ($W = 80.5$, $p = 0.035$, $r_{rb} = 0.395$) in continuous contexts than their parents. Even though none of the parents used the Preterite, the children were not statistically more likely to have used the Preterite than their parents ($W = 112$, $p = 0.158$, $r_{rb} = 0.158$). Nonetheless, Wilcoxon signed rank tests show that the children were more likely to use the Imperfect than either the Present ($V = 162$, $p = 0.007$, $r_{mrb} = 0.705$) or the Preterite ($V = 168$,

$p < 0.001$, $r_{mrb} = 0.965$). The children were also more likely to use the Present than the Preterite ($V = 9.5$, $p = 0.023$, $r_{mrb} = 0.756$). The same tests show that the parents were statistically more likely to use the Imperfect than the Present ($V = 105$, $p < 0.001$, $r_{mrb} = 1.000$) or the Preterite ($V = 105$, $p < 0.001$, $r_{mrb} = 1.000$). Even though they used a small number of tokens of the Present, this was not statistically different from their non-use of the Preterite ($V = 0$, $p = 0.174$, $r_{mrb} = 1.000$).

In sum, this evidence suggests that, although they diverged from the baseline in their use of the Present in continuous contexts, the extent of this divergence is not as large as it was for habitual contexts. One reason this might be the case is that the verbs used in continuous contexts are typically stative verbs, for which the maintenance of the Imperfect verb form has been documented (Silva-Corvalán, 1994, 2003, 2014). This divergence is in line with the predictions of the Feature Reassembly Hypothesis, as we would expect both continuous and habitual contexts to be the ones in which the form-meaning mappings would be most vulnerable, due to the cross-linguistic differences between English and Spanish in the expression of viewpoint aspect. However, the manifestation of this divergence from the baseline in the use of the Present rather than the Preterite is not entirely in line with the Feature Reassembly Hypothesis. Further evidence for this divergence may obtain from the accuracy rates in continuous contexts in the semantic interpretation task, which are summarised in Table 22.

Table 22: A descriptive summary of accuracy in continuous contexts in the semantic interpretation task

Accuracy rates for:	**Children**			**Parents**		
	Mean (SD)	**Median**	**Range**	**Mean (SD)**	**Median**	**Range**
Accepting the Imperfect	0.71 (0.30)	0.67	0.00–1.00	0.96 (0.12)	1.00	0.67–1.00
Rejecting the Preterite	0.46 (0.34)	0.50	0.00–1.00	0.87 (0.17)	1.00	0.67–1.00

As is the case with the contexts observed so far, we observe that the children are typically less accurate at both accepting the Imperfect and rejecting the Preterite in continuous contexts, and their accuracy rate at rejecting the Preterite is lower than observed for the other contexts. Wilcoxon rank sum tests confirm that the parents are more accurate at accepting the Imperfect ($W = 267$, $p = 0.006$, $r_{rb} = 0.483$) and rejecting the Preterite ($W = 301.5$, $p < 0.001$, $r_{rb} = 0.675$) than their children. Again, an impressionistic observation suggests that the parents are similar in their accuracy at accepting the Imperfect or rejecting the Preterite, whereas the children are more accurate accepting the Imperfect than rejecting the Preterite. Both of these are confirmed by Wilcoxon signed rank tests; the parents are not statistically different in their accuracy rates for

both morphemes (V = 17.5, p = 0.129, r_{mrb} = 0.667), whereas the children are more accurate at accepting the Imperfect than rejecting the Preterite (V = 82, p = 0.011, r_{mrb} = 0.802).

In sum, the data from continuous contexts provides a very similar picture to the data from habitual contexts. I observe that some of the children do not associate continuous meaning to the Imperfect in oral production, although the semantic interpretations are marginally better again.

6.3.5 Verb forms in progressive contexts

Recall that in progressive contexts, only the Imperfect (*cantaba* 'I was singing'), Imperfect Progressive (*estaba cantando* 'I was singing') or Perfective Progressive (*estuvo cantando* 'I was singing') were used by participants, which are all appropriate for use in progressive contexts, although none of the children used the Perfective Progressive form. Table 23 summarises the use of each of these three forms by the children and parents in the *Cat Story* narrative retelling task.

Table 23: A descriptive summary of group performance in progressive contexts in the production task

	Children				Parents			
	Tokens (%)	**Mean (SD)**	**Median**	**Range**	**Tokens (%)**	**Mean (SD)**	**Median**	**Range**
Imperfect	11 (35%)	0.32 (0.42)	0.00	0.00–1.00	9 (35%)	0.49 (0.42)	0.50	0.00–1.00
Imperfect Progressive	20 (65%)	0.68 (0.42)	1.00	0.00–1.00	14 (54%)	0.44 (0.38)	0.50	0.00–1.00
Perfective Progressive	-	-	-	-	3 (12%)	0.06 (0.12)	0.00	0.00–0.29

Whilst the distribution of tokens for the children and parents are very similar, the median and mean rates show that the children use the Imperfect Progressive form substantially more than their parents do. This may result from transfer from English, in which the compound progressive form is the only appropriate one to use in progressive contexts. However, Wilcoxon rank sum tests show that the children do not differ from their parents in the use of the Imperfect (W = 86.5, p = 0.248, r_{rb} = 0.281), Imperfect Progressive (W = 43.5, p = 0.146, r_{rb} = −0.356) or even the Perfective Progressive (W = 82.5, p = 0.071, r_{rb} = 0.222), even though none of the children used this form.

Wilcoxon signed rank tests further show that the children were not statistically different in their use of the Imperfect and Imperfect Progressive (V = 33, p = 0.115, r_{mrb} = −0.450), but that they used both the Imperfect (V = 28, p = 0.021, r_{mrb} = 1.000) and the Imperfect Progressive (V = 78, p = 0.002, r_{mrb} = 1.000) more than they used the Perfective Progressive. The parents likewise were

equally likely to use either the Imperfect or Imperfect Progressive (V = 16.5, p = 0.115, r_{mrb} = 0.179), but were more likely to use the Imperfect (V = 26, p = 0.049, r_{mrb} = 1.000) or the Imperfect Progressive (V = 21, p = 0.034, r_{mrb} = 1.000) than the Perfective Progressive.

As such, there is no evidence that the children differ from their parents in their use of verb forms to express progressive meaning. This is consistent with the Feature Reassembly hypothesis, under which we would expect little vulnerability in progressive contexts. Table 24 summarises the children and parents' accuracy in progressive contexts in the semantic interpretation task.

Table 24: A descriptive summary of accuracy in progressive contexts in the semantic interpretation task

Accuracy rates for:	Children			Parents		
	Mean (SD)	Median	Range	Mean (SD)	Median	Range
Accepting the Imperfect	0.75 (0.31)	0.67	0.00–1.00	0.90 (0.20)	1.00	0.33–1.00
Rejecting the Preterite	0.62 (0.34)	0.67	0.00–1.00	0.96 (0.11)	1.00	0.67–1.00

Wilcoxon rank sum tests show that the children are not significantly different from their parents in their accuracy at accepting the Imperfect in progressive contexts (W = 236.5, p = 0.091, r_{rb} = 0.285), although there was a trend towards significance for the parents being more accurate than the children. Conversely, the children were highly different from their parents in terms of their accuracy rejecting the Preterite in progressive contexts (W = 297, p < 0.001, r_{rb} = 0.614). The parents were neither more nor less accurate at accepting the Imperfect than rejecting the Preterite (V = 2, p = 0.345, r_{mrb} = 0.600), and nor were the children (V = 38, p = 0.073, r_{mrb} = 0.689), although this difference was approaching significance.

Consequently, the progressive contexts in the semantic interpretation task provide relatively similar evidence to that observed for each of the readings in the study, namely that the parents effectively perform at ceiling, with the children being far more heterogeneous. Again, we observe that the children are more accurate at accepting the appropriate form, in this case the Imperfect, than rejecting the inappropriate form, in this case the Preterite, although the difference in this case was not statistically significant. This lack of difference could potentially be attributed to reduced difficulty in progressive contexts in line with a Feature Reassembly model, however this non-difference also obtained for the habitual context, one of the more vulnerable ones under Feature Reassembly, and did not obtain for the perfective context, for which the representations should be less vulnerable. As such, it is difficult to argue that this data unambiguously supports a Feature-Reassembly account.

In sum, the results of the progressive contexts show that the children behave relatively similarly to their parents in both the production and comprehension tasks. The only exception is that the children were less likely to reject the Preterite in the semantic interpretation task, although this can potentially be explained as a result of an age effect (Ambridge & Rowland, 2013) or an effect of bilingualism (Polinsky & Scontras, 2020).

6.3.6 Verb forms in imperfective contexts overall

Having reviewed the data from each of the three imperfective readings in turn, I now assess the use of different verb forms in all imperfective contexts together, as well as accuracy accepting the Imperfect and rejecting the Preterite in these contexts. Especially for the comprehension task, this level of analysis is useful as it means that a more equal comparison can be made against children's performance in perfective and imperfective contexts. Additionally, as the overall number of items in imperfective contexts, nine, is larger than for the individual ratings, three, the data is more robust. I summarise the children's and parents' use of different verb forms across all three types of imperfective context in Table 25.

Table 25: A descriptive summary of group performance in all imperfective contexts in the production task

	Children				**Parents**			
	Tokens (%)	**Mean (SD)**	**Range**	**Median**	**Tokens (%)**	**Mean (SD)**	**Range**	**Median**
Imperfect	216 (69%)	0.65 (0.12)	0.07–1.00	0.78	255 (97%)	0.99 (0.03)	0.91–1.00	1.00
Preterite	27 (9%)	0.07 (0.14)	0.00–0.50	0.00	-	-	-	-
Present	56 (18%)	0.23 (0.29)	0.00–0.86	0.08	4 (3%)	0.01 (0.03)	0.00–0.09	0.00
Other	13 (4%)	0.05 (0.09)	0.00–0.29	0.00	-	-	-	-

Impressionistically, these data confirm more clearly what was observed throughout the analyses above: the parents consistently use the Imperfect or an appropriate progressive compound form in imperfective contexts, whereas the children use a wider range of alternatives in their production, especially the Present. Wilcoxon rank sum tests show that the children differ from their parents in their lower use of the Imperfect ($W = 264.5$, $p < 0.001$, $r_{rb} = -0.763$), and their greater use of the Present ($W = 35$, $p < 0.001$, $r_{rb} = 0.767$), as well as the Preterite ($W = 90$, $p = 0.011$, $r_{rb} = 0.400$) and the 'other' verb forms ($W = 97.5$, $p = 0.020$, $r_{rb} = 0.350$). It is therefore clear that a substantial number of children struggle to associate the Imperfect form to

imperfectivity, as has been documented in previous studies (e.g. Silva-Corvalán, 1994, 2003, 2014).

As expected, the parents consistently used the Imperfect more than they used the Present ($V = 120$, $p < 0.001$, $r_{mrb} = 1.000$), the Preterite ($V = 120$, $p < 0.001$, $r_{mrb} = 1.000$) and the 'other verb forms ($V = 120$, $p < 0.001$, $r_{mrb} = 1.000$). However, they did not use the Present more than the Preterite ($V = 6$, $p = 0.181$, $r_{mrb} = 1.000$) or the 'other' verb forms ($V = 6$, $p = 0.181$, $r_{mrb} = 1.000$). The children also used the Imperfect more than they used the Present ($V = 159.5$, $p = 0.010$, $r_{mrb} = 0.679$), the Preterite ($V = 170$, $p < 0.001$, $r_{mrb} = 0.988$), or the 'other' verb forms ($V = 171$, $p < 0.001$, $r_{mrb} = 1.000$). Their use of the Present was trending towards being significantly higher than their use of the Preterite ($V = 27$, $p = 0.065$, $r_{mrb} = 0.550$), and was statistically higher than their use of the 'other' verb forms ($V = 100$, $p = 0.025$, $r_{mrb} = 0.667$). Conversely, their use of the Preterite was statistically indistinguishable from their use of the 'other' verb forms ($V = 32.5$, $p = 1.000$, $r_{mrb} = 0.015$).

The only imperfective context type in which the children's use of another verb form was indistinguishable from their use of the Imperfect was the habitual reading. As such, whilst the data suggests that the Imperfect is more difficult for the children to associate with imperfectivity than the Preterite with perfectivity, it is specifically the habitual reading which yields this difficulty. To my knowledge, the only documentation of heritage speakers experiencing difficulty with using the Imperfect in habitual contexts is given by Silva-Corvalán (2003), as most of the production tasks used in studies of viewpoint aspect in Spanish heritage speakers have focused on whether the heritage speakers distinguish perfective and progressive meaning (Montrul, 2002; Cuza & Miller, 2015).

By way of comparison with their accuracy in perfective contexts, given above in Table 13, the children were equally accurate using the Preterite in perfective contexts as the Imperfect in imperfective contexts ($V = 78$, $p = 0.962$, $r_{mrb} = 0.020$). However, if we consider both the Preterite and Present Perfect as appropriate perfective forms, the children are substantially more accurate at associating any perfective past form with a perfective past context than an imperfective past form with an imperfective past context ($V = 114$, $p = 0.019$, $r_{mrb} = 0.676$), for which the use of the Present was the main alternative form used. Whilst the Present is semantically imperfective, it is nonetheless an incongruent form in these contexts. In view of this, the production data provides substantial evidence that the use of the Imperfect in imperfective contexts, of which specifically those that convey habitual, and to a lesser extent continuous, meaning, is more vulnerable in the heritage speakers' grammars than the use of perfective verb forms in perfective contexts. This behaviour is in line with the predictions of the Feature Reassembly hypothesis outlined at the

start of the chapter. I now consider the children's and parents' accuracy in imperfective contexts in the semantic interpretation task. The summary of the accuracy rates for both groups is given in Table 26.

Table 26: A descriptive summary of accuracy in all imperfective contexts in the semantic interpretation task

Accuracy rates for:	Children			Parents		
	Mean (SD)	**Median**	**Range**	**Mean (SD)**	**Median**	**Range**
Accepting the Imperfect	0.75 (0.22)	0.78	0.33–1.00	0.91 (0.10)	0.89	0.67–1.00
Rejecting the Preterite	0.53 (0.29)	0.56	0.00–1.00	0.89 (0.11)	0.89	0.67–1.00

The same pattern for the imperfective overall obtains as for the individual readings, and as for the perfective contexts; the parents are generally highly accurate at both accepting the Imperfect and rejecting the Preterite, whereas the children's accuracy rates are far more varied. Overall, the children's accuracy is lower than their parents for both accepting the Imperfect ($W = 295.5$, $p = 0.009$, $r_{rb} = -0.478$) and rejecting the Preterite ($W = 354$, $p < 0.001$, $r_{rb} = -0.770$), as is their accuracy at rejecting the Preterite compared to accepting the Imperfect ($V = 118.5$, $p = 0.009$, $r_{mrb} = 0.743$). Conversely, the parents' accuracy was equally high for both morphemes ($V = 29.5$, $p = 0.433$, $r_{mrb} = 0.311$).

In sum, the data from imperfective contexts in the semantic interpretation task is congruent with the general observed pattern for each of the readings of the imperfective: the parents have relatively high overall accuracy ratings for both morphemes, whereas the children are better at accepting the Imperfect than rejecting the Preterite. This is in line with the reported reluctance of heritage speakers to rejecting inappropriate sentences (Polinsky & Scontras, 2020). These rates of acceptance and rejection of the two morphemes are similar to the ratings given by the children and parents in perfective contexts as well, as detailed in Table 17. Indeed, Wilcoxon signed rank tests show that this is the case; the children are equally likely to accept the Preterite in perfective contexts as the Imperfect in imperfective contexts ($V = 83.5$, $p = 0.438$, $r_{mrb} = 0.228$), and to reject the Imperfect in perfective contexts as to reject the Preterite in imperfective contexts ($V = 200.5$, $p = 0.153$, $r_{mrb} = 0.337$). The parents were also equally accurate at accepting the appropriate morpheme ($V = 18.5$, $p = 0.106$, $r_{mrb} = 0.762$) and rejecting the inappropriate morpheme ($V = 32$, $p = 0.053$, $r_{mrb} = 0.778$), although this last rate was approaching the threshold of significance at the 5% level.

6.3.7 Interim summary

The evidence from the narrative retelling task and semantic interpretation task confirms a number of expected behaviours among the heritage speakers. First, whilst the parents were relatively consistently performing at ceiling in their association of the Preterite with perfectivity and the Imperfect with imperfectivity, the children's data are highly heterogeneous in all conditions, with the exception of the use of the Imperfect and compound progressive forms in progressive contexts. Despite this heterogeneity, two related points stand out. First, the children are generally less accurate than their parents. In the comprehension task, this decreased accuracy was especially visible for rejecting the inappropriate morpheme, with the lowest overall accuracy seen in continuous contexts. In the production task, the children differed from the parents the most in habitual contexts. The increased vulnerability of both of these contexts is consistent with the predictions made under the revised feature reassembly model being tested (Putnam & Sánchez, 2013).

Following on from this increased difficulty associating the Imperfect with habitual–and, to a lesser extent, continuous–contexts than associating the Imperfect with progressive contexts or the Preterite with perfective contexts, these results are consistent with the predictions of the Feature Reassembly Hypothesis (Lardiere, 2009; Domínguez, Arche & Myles, 2011, 2017). However, the use of the Present is not entirely consistent with the Feature Reassembly Hypothesis, under which we would expect the Preterite to displace the Imperfect in habitual and continuous contexts due to influence from English. Use of the Present could be considered to reflect the sort of performance-based divergence that characterises the initial stages of feature reassembly prior to restructuring of the grammar in Putnam and Sánchez's (2013) model. Likewise, it could reflect an initial restructuring of the representations, similar to the developmental trajectory of L2 learners of Spanish (Domínguez, Arche & Myles, 2011, 2017). As such, it is unclear whether this use of the Present reflects a representational issue of appropriate assembly of the features onto the Imperfect form, or whether it reflects an on-line performance issue. I return to discuss this distinction in Chapter 7.

Central to Putnam and Sánchez's (2013) model is the claim that language activation and access will explain both the incidence of performance errors in heritage speakers' productions at low levels of imbalance in favour of English, and representational changes to the grammar in cases of especially low deactivation of the Spanish. This claim is explicitly in opposition to earlier claims in the field (e.g. Montrul, 2002; Silva-Corvalán, 2003) that divergence from the baseline grammar results from reduced input. I investigate Putnam and Sánchez's claims, in addition to the broader

claims of the effects of input quantity and input quality on heritage language acquisition, as well as potential confounding factors, in the following sections.

6.4 Individual analysis of the children's performance on the tasks

Before examining the predictive variables in detail, I will individually examine the children's performance on the tasks, overall and per condition. To begin with, I provide the children's individual accuracy rates in the comprehension and production tasks in Table 27 and Table 28, respectively. Following these tables, I will remark upon the individual performances, in light of the children's individual characteristics as recorded in Tables 4, 5 and 6.

In Table 27, the accuracy rates are given in percentages for each form in each context type. In the perfective contexts, the accuracy rates are for accepting the Preterite and rejecting the Imperfect; in the remaining contexts, they are for rejecting the Preterite and accepting the Imperfect.

Table 27: Individual accuracy rates of the forms by each child in each context type in the semantic interpretation task. Bold and underline type signifies accept rate, plain text is reject.

	Perfective		**Habitual**		**Continuous**		**Progressive**	
Participant	**PRET.**	**IMP.**	**PRET.**	**IMP.**	**PRET.**	**IMP.**	**PRET.**	**IMP.**
MC01	**40**	40	100	**100**	-	**-**	100	**100**
CC02	**44**	44	100	**100**	67	**67**	67	**67**
SC03	**78**	22	0	**67**	0	**100**	0	**100**
SC04	**56**	33	33	**33**	33	**33**	33	**67**
SC05	**89**	89	100	**100**	33	**33**	100	**100**
SC06	**100**	89	100	**100**	67	**100**	33	**100**
MC07	**56**	44	33	**67**	33	**100**	100	**100**
MC08	**78**	78	100	**100**	67	**67**	33	**67**
SC09	**78**	78	67	**67**	33	**33**	100	**100**
SC10	**89**	22	33	**100**	67	**100**	0	**67**
AC11	**67**	100	100	**67**	100	**33**	33	**0**
SC12	**80**	0	0	**50**	0	**0**	50	**50**
SC13	**78**	44	33	**100**	67	**100**	67	**67**
AC14	**100**	100	100	**100**	67	**67**	100	**100**
AC15	**56**	56	33	**33**	33	**67**	0	**0**
SC16	**44**	56	100	**33**	33	**67**	67	**33**
SC17	**100**	67	33	**33**	0	**33**	67	**100**
SC18	**89**	78	100	**100**	67	**67**	100	**100**
SC19	**56**	56	67	**67**	100	**100**	67	**67**
MC20	**100**	100	0	**67**	67	**100**	100	**100**
MC21	**100**	100	-	**-**	0	**100**	-	**-**
MC22	**100**	50	-	**-**	0	**100**	-	**-**
SC23	**78**	56	33	**67**	0	**67**	67	**100**
SC24	**78**	78	33	**33**	67	**67**	67	**67**
AC25	**78**	67	67	**67**	100	**100**	67	**67**

Table 28: Individual usage rates of the forms by each child in each context type in the cat story. In each form column, the number is a percentage value.

	Perfective					**Habitual**					**Continuous**					**Progressive**				
Participant	**PRET**	IMP	PRES	OTH	*COUNT*	PRET	**IMP**	PRES	OTH	*COUNT*	PRET	**IMP**	PRES	OTH	*COUNT*	PRET	**IMP**	PRES	OTH	*COUNT*
MC01 @	**-**	-	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
CC02	**100**	0	0	0	*5*	0	**0**	100	0	*10*	0	**33**	67	0	*6*	0	**100**	0	0	*2*
SC03 @	**-**	-	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
SC04 !	**-**	-	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
SC05	**100**	0	0	0	*5*	0	**91**	09	0	*11*	0	**67**	33	0	*6*	0	**100**	0	0	*2*
SC06	**100**	0	0	0	*12*	0	**71**	7	21	*14*	0	**100**	0	0	*2*	0	**100**	0	0	*2*
MC07	**100**	0	0	0	*13*	60	**0**	20	20	*5*	3	**97**	0	0	*29*	0	**100**	0	0	*3*
MC08	**100**	0	0	0	*6*	29	**0**	14	57	*7*	0	**86**	14	0	*7*	-	**-**	-	-	-
SC09	**97**	0	0	03	*30*	0	**0**	33	67	*3*	0	**100**	0	0	*5*	0	**100**	0	0	*4*
SC10	**56**	6	0	38	*16*	7	**80**	13	0	*15*	0	**100**	0	0	*8*	0	**100**	0	0	*4*
AC11	**14**	19	0	67	*21*	0	**25**	0	75	*12*	0	**90**	10	0	*10*	0	**100**	0	0	*1*
SC12	**50**	23	27	0	*22*	7	**93**	0	0	*14*	0	**93**	7	0	*15*	0	**100**	0	0	*3*
SC13 @	**-**	-	-	-	-	0	**50**	50	0	*2*	0	**100**	0	0	*1*	-	**-**	-	-	-
AC14	**74**	5	21	0	*19*	0	**86**	0	14	*7*	0	**83**	17	0	*6*	0	**100**	0	0	*1*
AC15	**33**	0	0	66	*6*	0	**29**	43	29	*7*	0	**0**	100	0	*3*	-	**-**	-	-	-
SC16	**0**	14	0	86	*7*	-	**-**	-	-	-	0	**75**	25	0	*7*	0	**100**	0	0	*3*
SC17	**86**	0	0	14	*7*	0	**100**	0	0	*1*	0	**89**	11	0	*9*	0	**100**	0	0	*1*
SC18 #	**-**	-	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
SC19	**0**	0	0	100	*1*	0	**0**	100	0	*4*	0	**100**	0	0	*1*	-	**-**	-	-	-
MC20	**83**	8	0	8	*12*	-	**-**	-	-	-	8	**0**	92	0	*13*	0	**100**	0	0	*1*
MC21 #	**-**	-	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
MC22 #	**100**	0	0	0	*1*	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
SC23	**100**	0	0	0	*3*	0	**100**	0	0	*3*	0	**100**	0	0	*7*	0	**100**	0	0	*1*
SC24	**0**	0	0	100	*10*	0	**100**	0	0	*3*	0	**100**	0	0	*3*	0	**100**	0	0	*2*
AC25	**70**	0	30	0	*10*	50	**50**	0	0	*10*	100	**0**	0	0	*3*	-	**-**	-	-	-

Key: '@' indicates primary or exclusive use of the present tense. '#' indicates substantial or exclusive reliance on parent. '!' is a child who produced very few utterances.

One of the striking facets shown by these data is that there is a relative degree of dissimilarity between the children's performance in the different tasks and conditions. Generally speaking, I would expect the children's performance to be similar across tasks within the same condition, but here we observe children such as SC12, who had relatively low accuracy rates across all conditions in the semantic interpretation task nonetheless had relatively consistently high accuracy rates across all conditions in the production task. SC12 was the youngest participant in the study, at 6;5 at the time of testing. One question that stands out then is whether age alone has a strong relationship with the children's performance, especially on the semantic interpretation task. Although I will formally examine the role of age through correlation analysis in Section 6.5.1, it is worth briefly taking the opportunity to examine whether the oldest children are uniformly better than the younger children, especially in the semantic interpretation task, which would suggest that other characteristics associated with increased age such as cognitive maturity may explain a substantial amount of the behaviour on the task, or whether there seems to be a more complex pattern of behaviour.

There were 5 participants aged 7;00 and under in the study: SC12 (5;06), SC16 (6;00), MC22 (6;03), SC04 (6;10) and SC18 (7;00). Conversely, there were only three participants aged 14;00 and older in the study: SC06 (14;02), SC23 (14;08) and SC05 (15;06). Since MC22 did not produce a large number of sentences or rate the whole set, I leave aside their data from this part of the analysis. Focusing on the remaining children's performance in the semantic interpretation task, I computed an average accuracy rate across all conditions, as well as taking into account their performance within each condition. I also considered their production ratings. SC04 and SC18 also did not produce any sentences, although their comprehension data are complete The individual accuracy rates can be found in Tables 27 and 28, and the averages are as follows. In the younger group, SC12 had an average interpretation accuracy rate of 28.75% and an average production accuracy rate of 84%; SC16's interpretation accuracy was 54.125% and their production accuracy was 58.33%; SC04 had a comprehension accuracy rate of 40.125%; and SC18 had an interpretation accuracy rate of 87.625%. Thus, a consistently high accuracy rate in the semantic interpretation task is possible by age 7;00, and it is therefore possible that lower accuracy rates in the younger children result from this effect. In the oldest ages, SC06 had an average accuracy rate in the comprehension task of 86.125% and in the production task of 92.75%; SC23's average comprehension accuracy was 58.5% and their production accuracy was 100%; finally, SC05 had an accuracy rate of 80.5% in the semantic interpretation task and 89.5% in the production task. Curiously, despite their performance at ceiling in the production task, SC23 has a similar semantic interpretation accuracy as SC16, who was only 6;00 at the time of testing.

It is therefore my view that although the oldest children in the sample clearly benefit from increased performance on the semantic interpretation task compared to the youngest children in the sample, their consistent high performance owes more to being bilinguals who are comfortable and confident in Spanish than to their increased age. In other words, the generally high accuracy rates achieved by the children in this age bracket reflects the fact that all of the individuals in this age bracket are highly proficient bilinguals, rather than necessarily reflecting their increased age and related effects.

Another factor according to which the children differ is the country of origin of their Spanish-speaking parents. Of the whole sample, 14 children had parents from Spain (SC), 6 children had parents from Mexico (MC), 4 children had a parent from Argentina (AC) and 1 child had a parent from Colombia (CC).[18] Whilst the only grammatical consequence of this differentiation relates to the possibility of using the Present Perfect in lieu of the Preterite in most of Spain and parts of Latin America (see Section 3.5), the effects of which I examine for relevant data in Section 6.5.1, it is nonetheless worth examining whether there was a relationship between the country of origin and the children's accuracy rates. Although not ideal as the children vary by other dimensions as well, I will examine this effect by considering the balance of children with a Spaniard parent and children with non-Spaniard parents at the higher and lower quintiles, and ascertain whether the parents' nationality may have had an effect on the distribution of the children's performance on the tasks. Given that 56% of the children have a parent from Spain, we would expect them to be in the slight majority in each of the upper and lower quintiles, if the only relevant factor were country of origin.

In the comprehension task, the top quintile were AC14 (91.75%), SC18 (87.825%), SC06 (86.125%) and AC25 (76.825%), of whom 60% were of Spanish origin; the lowest quintile were SC17 (45.125%), SC03 (45.875%), SC04 (40.125%), AC15 (34.75%), and SC12 (28.75%), of whom 80% were of Spanish origin. Consequently, the larger number of Spanish-origin participants in the lowest quintile may suggest that children from other countries were at a slight advantage in the semantic interpretation task; this may reflect the fact that the task was designed by a speaker of Chilean Spanish, with the recordings from a Mexican speaker, and the fact that the Spanish pilot was conducted with speakers from the Canary Islands and Galicia (see Section 5.3.2.1), areas in which regional variation is often more Latin American than in other parts of Spain (see Section 3.5). In the production task, the upper quintile were SC23 (100%), SC17 (93.75%), SC06 (92.75%), SC05 (89.5%) and AC14 (85.75%), of whom 80% were of Spanish origin; the lowest quintile were

[18] It is worth noting that this parent had lived in Spain for several years and her Spanish grammar may represent European norms in many respects, as briefly recounted in Section 5.2.

CC02 (58.25%), AC11 (57.25%), AC25 (40%), SC19 (33.33%), and AC15 (20.66%), of whom 20% were of Spanish-origin. As such, there may be weak evidence that the production task advantaged children whose parents were Spaniards in comparison to children from other parts of the world. However, why this would be the case is unclear.

In sum, a brief investigation of the ages of participants suggests that there may be an effect of cognitive maturity, especially in terms of accuracy on the semantic interpretation task, until age 7;00, after which variation appears to reflect proficiency more. A separate analysis of individual accuracy rates in view of participants' parents' country of origin suggested that there may be a very small advantage for non-European countries of origin in the semantic interpretation task, although there is equally weak evidence that there may be a small advantage for participants with a Spanish parent in the production task. However, other factors, such as age as also discussed in this section, are likely to have had an impact on these rates, and as such I do not think parents' country of origin necessarily affected the results.

6.5 Analysis of the explanatory power of various predictor variables

In this section, I analyse the role of several variables in explaining why the individual heritage speakers in the study do or do not diverge from the baseline grammar of the input. I begin with variables that have been noted in the literature but are not especially related to the theoretical proposals of Putnam and Sánchez (2013). In the case that these factors are systematically related to the heritage speakers' outcomes, it would be necessary to examine the theoretically relevant variables once these variables had been controlled for separately. Following this, I assess the role of input quantity, which was formerly assumed to be an important predictor of heritage speaker outcomes (e.g. Silva-Corvalán, 2003). After this, I investigate Putnam and Sánchez's (2013) model by examining language access measures. Where relevant, I refer to the sub-groups of children relating to regional variation in the baseline for perfective contexts.

6.5.1 Assessing the role of parents, birth country, birth order, input quality and age

The potentially confounding variables are: the number of Spanish-speaking parents or adults in the family; whether the child was born in or outside the UK; whether the child is the oldest in the family; the role of input quality; and finally the effect of age. For the first three of these variables, as they are categorical, I report Wilcoxon rank sum tests of between group differences for the children. I only report the cases where a difference was observed. For input quality and age, these are continuous variables, and I therefore analyse correlation values. I report all of the values in tables, and then discuss the magnitude of the correlations and the consistency of the effect.

In terms of Spanish-speaking parents, the number of Spanish-speaking parents was only significantly associated with the acceptance of the Preterite in perfective contexts of the semantic interpretation task ($W = 3$, $p = 0.005$, $r_{rb} = 0.681$), with children with two Spanish-speaking parents being statistically more likely to have higher accuracy accepting the Preterite than children with only one. A smaller association was also observed for children whose parents extend the Present Perfect into recent perfective contexts, for whom those with two Spanish-speaking parents were unexpectedly less likely to use the Present Perfect ($W = 26.5$, $p = 0.039$, $r_{rb} = -0.767$), without making them statistically more likely to use the Preterite ($W = 6$, $p = 0.114$, $r_{rb} = 0.600$). In view of the paucity of these data, there is no evidence that the number of Spanish-speaking parents is a predictive factor for the children's grammatical outcomes in Spanish viewpoint aspect.

For whether the child was born in the UK or not, which again I would expect to be associated with increased accuracy due to the concomitant increased exposure to Spanish, there is once again very little association of this variable with performance in the various contexts. Children born outside the UK are more accurate at accepting the Imperfect in habitual contexts in the semantic interpretation task ($W = 80$, $p = 0.034$, $r_{rb} = 0.569$). They are also trending towards lower usage of the Preterite in habitual contexts ($W = 18$, $p = 0.071$, $r_{rb} = 0.455$) and the Present in perfective contexts ($W = 16$, $p = 0.153$, $r_{rb} = 0.333$) in the narrative retelling task. Within the extending variety group, children born outside the UK are also statistically less likely to use the Present Perfect in perfective contexts ($W = 1.5$, $p = 0.036$, $r_{rb} = 0.875$). Although more widely explanatory than the number of parents, there is again no systematic relationship between this variable and the children's grammatical outcomes.

Whether a child is the oldest in the family or not has also been argued to be associated with likeliness to diverge from the baseline grammar (Silva-Corvalán, 1994). However, Wilcoxon rank sum tests show that the oldest child only outperforms younger siblings in their rate of acceptance of the Imperfect in progressive contexts in the semantic interpretation task ($W = 98$, $p = 0.029$, $r_{rb} = 0.508$). No association was observed within the groups based on regional variation either. As such, I conclude that this variable is also not relevant to whether a heritage speaker converges with or diverges from the baseline grammar in the expression of viewpoint aspect.

The next variable I consider is input quality, which has long been argued to be associated with heritage speakers' outcomes (Montrul, 2002; Rothman, 2009; Domínguez, 2009; Polinsky & Scontras, 2020). In Table 29, I present the Spearman's rank correlation values for input quality.

Table 29: The association between input quality and each verb form in the narrative retelling (NR) and semantic interpretation (SI) tasks

Context	Task	Morpheme	S	r_s	p	
Perfective	NR	Preterite	882.71	0.226	0.353	
	NR	Present Perfect	871.50	0.236	0.332	
	NR	*Perfectives together*	*568.87*	*0.501*	*0.029*	*
	NR	Imperfect	1155.90	−0.014	0.955	
	NR	Present	1774.30	−0.556	0.013	*
	NR	Other	1260.00	−0.105	0.668	
	SI	Preterite accept	2389.60	0.081	0.701	
	SI	Imperfect reject	2095.70	0.194	0.353	
Habitual	NR	Imperfect	781.72	0.042	0.873	
	NR	Preterite	657.99	0.194	0.457	
	NR	Present	846.88	−0.038	0.885	
	NR	Other	862.68	−0.057	0.827	
	SI	Imperfect accept	1668.00	0.176	0.422	
	SI	Preterite reject	1211.80	0.401	0.058	.
Continuous	NR	Imperfect	1091.00	0.043	0.861	
	NR	Preterite	1324.00	−0.161	0.509	
	NR	Present	1146.90	−0.006	0.980	
	SI	Imperfect accept	2227.80	0.031	0.884	
	SI	Preterite reject	2088.90	0.092	0.670	
Prog.	SI	Imperfect accept	1876.50	0.073	0.741	
	SI	Preterite reject	2039.40	−0.008	0.972	
Imperfective	NR	Imperfect	982.86	0.138	0.574	
	NR	Preterite	1172.90	−0.029	0.907	
	NR	Present	1084.10	0.049	0.842	
	NR	Other	1245.40	−0.092	0.707	
	SI	Imperfect accept	2408.30	0.074	0.726	
	SI	Preterite reject	2138.60	0.177	0.396	

Although it is very difficult to precisely quantify the quality of exposure children receive, the literature broadly seems to refer to input quality in terms of access to a variety of different sources of exposure to the heritage language (e.g. Polinsky & Scontras, 2020). The BiLEC questionnaire (Unsworth, 2013) computes a measure of 'richness of sources to exposure', calculated as a percentage value based on the number of sources of exposure to Spanish outside the family, which I use as a proxy for input quality in this study. There is evidence of moderate positive correlations in the use of both the Preterite and Present Perfect together in the narrative

retelling task, and for accuracy rejecting the Preterite in habitual contexts in the semantic interpretation task, although this latter one was not statistically significant. There was also a moderate negative correlation between the use of the Present in perfective contexts in the narrative retelling task. In all other cases, the data shows very little association between the measure of input quality and the heritage speakers' rates of use and accuracy for the various morphemes.

However, within the perfective contexts, there is a lot of additional variation within the two sub-groups relating to regional variation in the baseline. In addition to the reduction in the use of the Present, those whose parents allow extension of the Present Perfect into recent perfective contexts saw a small positive association with increased acceptance of the Preterite (r_s = 0.288, *p*= 0.298) and a moderate positive association with increased rejection of the Imperfect (r_s = 0.433, *p* = 0.107) in the semantic interpretation task as well. Conversely, in addition to the group-wide association with decreased use of the Present, increased richness of input quality was also associated with small decreases in use of the Imperfect (r_s = −0.283, *p* = 0.497) and 'other' verb forms (r_s = −0.364, *p*= 0.376) in the narrative retelling task. In view of the smaller sub-group sizes, none of these associations was significantly different from zero, and they do not provide clear evidence of an association or lack of association with input quality. Consequently, this study provides no substantial evidence that input quality is a principal explanatory factor for the acquisition of viewpoint aspect by heritage speakers.

The next variable that I focus on is the heritage speakers' age at time of testing. Since the heritage speakers in this study are distributed across a number of ages, it is important to assess the contribution of age to their accuracy rates. Polinsky and Scontras (2020) highlight that a 'bilingual delay' in acquisition may explain some of the ways in which heritage speakers diverge from the baseline grammar. Indeed, Cuza and Miller (2015) demonstrated that accuracy with the Imperfect increased for children in their study, highlighting the importance of this measure.

In view of the potential importance of test age, I summarise the Spearman's rank correlation coefficients of participants' age with their accuracy and usage rates across both tasks in Table 30.

Table 30: The association between age at time of testing and each verb form in the narrative retelling (NR) and semantic interpretation (SI) tasks

Context	Task	Morpheme	S	r_s	p	
Perfective	NR	Preterite	855.28	0.250	0.303	
	NR	Present Perfect	1256.20	−0.102	0.678	
	NR	*Perfectives together*	*838.57*	*0.264*	*0.274*	
	NR	Imperfect	1600.80	−0.404	0.086	.
	NR	Present	1083.30	0.050	0.840	
	NR	Other	1472.30	−0.292	0.226	
	SI	Preterite accept	2417.60	0.070	0.739	
	SI	Imperfect reject	1609.40	0.381	0.060	.
Habitual	NR	Imperfect	526.35	0.355	0.162	
	NR	Preterite	965.61	−0.183	0.481	
	NR	Present	1213.90	−0.488	0.047	*
	NR	Other	831.22	−0.019	0.943	
	SI	Imperfect accept	1487.20	0.265	0.221	
	SI	Preterite reject	1603.70	0.208	0.342	
Continuous	NR	Imperfect	891.37	0.218	0.370	
	NR	Preterite	1077.80	0.055	0.824	
	NR	Present	1414.40	−0.241	0.321	
	SI	Imperfect accept	2251.50	0.021	0.922	
	SI	Preterite reject	1747.90	0.240	0.259	
Prog.	SI	Imperfect accept	1029.00	0.492	0.017	*
	SI	Preterite reject	1412.00	0.302	0.161	
Imperfective	NR	Imperfect	851.62	0.253	0.296	
	NR	Preterite	1414.50	−0.241	0.321	
	NR	Present	1574.40	−0.381	0.108	
	NR	Other	1083.00	0.050	0.839	
	SI	Imperfect accept	2277.30	0.124	0.555	
	SI	Preterite reject	1570.50	0.396	0.050	.

Beginning with perfective contexts, age is associated with a small increase in the use of either perfective form, and the Preterite form specifically, alongside a small decrease in the use of the 'other' verb forms and a moderate decrease in the use of the Imperfect. In the semantic interpretation task, there was also a small association between increased age and increased rejection of the Imperfect. Within the sub-group whose parents spoke a Present Perfect-extending variety of Spanish, test age was associated with a large increase in the use of the Preterite (r_s = 0.648, p = 0.031) and perfective forms overall (r_s = 0.727, p = 0.011), as well as a small decrease in the use of the Present Perfect (r_s = −0.359, p = 0.278). Overall, the imperfective

contexts show a small positive association for increased use of the Imperfect and a small negative association for decreased use of the Present, as well as a small positive association for increased accuracy rejecting the Preterite in the semantic interpretation task. These results therefore suggest that age at time of testing may play a substantial role in the children's behaviour in the production and semantic interpretation tasks used in the study. However, it is also clear that this association is strongest for the perfective and progressive contexts, which are the ones that are least likely to be affected for Spanish heritage speakers in an English-dominant context, with little evidence of an association for continuous contexts and mixed evidence for habitual contexts.

In sum, reviewing the contribution of each of these variables, the only one that has a systematic relationship with the children's outcomes in this study is their age at time of testing. Since age at time of testing is a continuous variable, the way to control for it in the correlation analyses that follow would be to conduct multiple regression analysis using generalized linear methods. Whilst this is possible, the small size of the sample and constrained sized of the dataset, especially for the comprehension data, would make it difficult to ascertain whether the models were appropriate. As such, in this thesis I will conduct individual rank correlation analyses for each of the remaining variables, and compare the results of the correlations to those that have been observed for age alone to establish whether it is likely that there is a separate effect for that variable.

6.5.2 Assessing the role of input quantity

Input quantity has long been argued to affect the grammatical outcomes of heritage language acquisition (Montrul, 2002; Silva-Corvalán, 2003), although Putnam and Sánchez (2013) question its direct relevance. The BiLEC questionnaire calculates two quantified measures of the input a child receives in each of their languages: cumulative exposure and relative exposure. Cumulative exposure is the approximate amount of the time in their whole life that has been spent in the language rather than in the other language, while relative exposure is the approximate amount of their current language environment that is in that language.

Table 31 summarises the correlations of each verb form in each context in both tasks with both of these measures of input quantity. The rank correlations provide very little evidence of a strong association between input quantity and the heritage speakers' grammatical outcomes of the acquisition of viewpoint aspect, as cumulative exposure only had an association with three of the contexts whereas relative exposure only had an association with four of the contexts. I will consider each of these in turn.

Table 31: The association between two measures of input quantity and each verb form in the narrative retelling (NR) and semantic interpretation (SI) tasks

			Cumulative Exposure (yrs)			Relative Exposure (%)		
Context	**Task**	**Morpheme**	**S**	**r_s**	**p**	**S**	**r_s**	**p**
Perfective	NR	Preterite	881.90	0.226	0.351	934.16	0.181	0.460
	NR	Present Perfect	1097.20	0.038	0.879	1023.00	0.103	0.676
	NR	*Perfectives together*	*1090.30*	*0.044*	*0.859*	*1021.40*	*0.104*	*0.672*
	NR	Imperfect	774.85	0.320	0.181	736.89	0.354	0.138
	NR	Present	1352.70	−0.187	0.444	1386.00	−0.216	0.375
	NR	Other	1147.90	−0.007	0.978	1242.50	−0.090	0.714
	SI	Preterite accept	1964.30	0.245	0.239	2079.60	0.200	0.337
	SI	Imperfect reject	2059.50	0.209	0.319	2805.20	−0.079	0.708
Habitual	NR	Imperfect	798.73	0.021	0.936	646.98	0.207	0.425
	NR	Preterite	930.16	−0.140	0.592	845.85	−0.037	0.889
	NR	Present	695.23	0.148	0.571	761.62	0.067	0.799
	NR	Other	858.12	−0.052	0.844	1001.30	−0.227	0.381
	SI	Imperfect accept	1498.00	0.260	0.231	166.20	0.176	0.422
	SI	Preterite reject	1923.60	0.050	0.822	1979.00	0.022	0.920
Continuous	NR	Imperfect	822.68	0.278	0.249	796.40	0.301	0.210
	NR	Preterite	1374.60	−0.206	0.398	1584.70	−0.390	0.099
	NR	Present	1385.70	−0.216	0.376	1399.70	−0.228	0.348
	SI	Imperfect accept	2634.20	−0.145	0.498	2736.40	−0.190	0.375
	SI	Preterite reject	2163.60	0.059	0.783	2540.20	−0.104	0.627
Prog.	SI	Imperfect accept	1770.10	0.125	0.568	2246.80	−0.110	0.617
	SI	Preterite reject	1841.90	0.090	0.683	2317.80	−0.145	0.509
Imperfective	NR	Imperfect	1053.90	0.076	0.759	730.92	0.359	0.131
	NR	Preterite	1267.10	−0.111	0.650	1195.60	−0.049	0.843
	NR	Present	1036.00	0.091	0.710	1228.20	−0.077	0.753
	NR	Other	1286.80	−0.129	0.599	1397.60	−0.226	0.352
	SI	Imperfect accept	2667.40	−0.026	0.902	2803.90	−0.078	0.710
	SI	Preterite reject	2477.20	0.047	0.823	2939.60	−0.131	0.534

6.5.2.1 The role of cumulative exposure

Cumulative exposure was associated with a small increase in the use of the Imperfect in continuous contexts and a small increase in acceptance of the Imperfect in habitual contexts, both of which are in line with Feature Reassembly, although the wider lack of an effect of input quantity in continuous and habitual contexts means that it is hard to view this effect as meaningful. Curiously, there is also a slightly larger small positive association between the

children's input in Spanish and their use of the Imperfect in perfective contexts, where we would have expected to see a negative association as the Preterite is the target form in these contexts.

Looking more closely at the sub-groups within the perfective, we observe that this unexpected association reflects a very strong positive association within the group of children whose parents do not allow the extension of the Present Perfect into recent perfective contexts (r_s = 0.764, p = 0.027). These children also had a small positive association for the use of the Preterite in perfective contexts as well (r_s = 0.304, p = 0.464). The children whose parents allowed the extension of the Present Perfect had moderate positive associations between increased input and increased accuracy at accepting the Preterite (r_s = 0.400, p = 0.139) and rejecting the Imperfect (r_s = 0.422, p = 0.118) in the semantic interpretation task, as well as for using the Preterite (r_s = 0.648, p = 0.031) in lieu of the Present Perfect (r_s = −0.588, p = 0.057) in the narrative retelling task. Of course, the small numbers within the two sub-groups means that these correlation values are rarely significant and need to be viewed as potentially reflecting random noise, but generally the values provide a similar, albeit less consistent, picture as observed within the sub-groups for age at time of testing.

6.5.2.2 The role of relative exposure

Increased relative exposure was associated with a small increase in the use of the Imperfect in perfective contexts, which is unexpected, as well as with a small increase in Imperfect use in continuous contexts and imperfective contexts overall, and with a small decrease in the use of the Preterite in continuous contexts. Both of these findings would be expected if the reduced input hypothesis (Silva-Corvalán, 2003) explains heritage speakers' grammatical outcomes. In the semantic interpretation task, there was also a moderate positive association between relative exposure and acceptance of the Imperfect in habitual contexts. Whilst this series of associations is slightly more numerous than those observed for the whole group for cumulative exposure, it is nonetheless far smaller than would be expected if there was a systematic relationship between input quantity and convergence with the baseline grammar. This is especially true given that little association was observed for the habitual and continuous contexts, which are the ones that are predicted to be most vulnerable in heritage language acquisition under Feature Reassembly.

There is a substantial difference between the two sub-groups based on regional variation in the baseline grammar in perfective contexts. Children whose parents allow the extension of the Present Perfect into recent perfective contexts show a small positive association between relative exposure and use of the preterite (r_s = 0.315, p = 0.346), alongside a moderate negative association with use of the Present Perfect (r_s = −0.546, p= 0.083). Overall, this translates into a moderate negative association with use of either perfective form (r_s = −0.600, p = 0.051). Even

more surprisingly, there are moderate positive associations between increased relative exposure and use of the Imperfect (r_s = 0.495, p = 0.122), Present (r_s = 0.400, p = 0.223), and 'other' verb forms (r_s = 0.500, p = 0.117) for this group as well. In the semantic interpretation task, this group has a moderate positive association with increased relative exposure and increased accuracy accepting the Preterite (r_s = 0.487, p = 0.065).

The picture was substantially different for the children whose parents do not allow the extension of the Present Perfect into recent perfective contexts. For these children, increased relative exposure was associated with a strong increase in the use of the Preterite (r_s = 0.919, p = 0.001), a strong decrease in the use of the Present (r_s = −0.659, p = 0.076) and a moderate decrease in the use of 'other' verb forms (r_s = −0.408, p = 0.316). Each of these results is in line with the reduced input hypothesis. However, there is also a small negative association between increased relative exposure and decreased accuracy at rejecting the Imperfect (r_s = −0.282, p = 0.430), which is not in line with the predictions of the hypothesis.

6.5.2.3 Summary

In sum, the correlation values for both cumulative exposure and relative exposure suggest that there is not a strong association between input quantity and the heritage speakers in this study's grammatical outcomes for viewpoint aspect. This finding is surprising given the wide assumption of the relevance of input quantity to explaining heritage speakers' grammatical outcomes (Polinsky & Scontras, 2020). However, this is in line with the fact that Putnam and Sánchez (2013) did explicitly call the explanatory power of input quantity alone into question in the elaboration of their Feature Reassembly model of heritage language acquisition. Instead, Putnam and Sánchez argue that language activation measures will more accurately predict outcomes for heritage speakers, which I consider in the next section.

6.5.3 Assessing the role of language activation

In this section, I assess the role of language activation in explaining the heritage speakers' grammatical outcomes, in view of Putnam and Sánchez's (2013) claims. The first measure is relative output in Spanish, a percentage value for the amount of language produced by the child that is in Spanish. The second measure is Spanish speech rate in words per minute, recognised to be a reasonable proxy for proficiency (Polinsky, 2008; Nagy & Brook, 2020). Putnam and Sánchez (2013) explicitly claim that proficiency and output reflect language access. I provide the correlation coefficients for both variables in Table 32.

Table 32: The association between two measures of language activation and each verb form in the narrative retelling (NR) and semantic interpretation (SI) tasks

			Relative Output (%)			Spanish speech rate (wpm)		
Context	**Task**	**Morpheme**	**S**	**r_s**	**p**	**S**	**r_s**	**p**
Perfective	NR	Preterite	1154.40	−0.013	0.959	829.72	0.272	0.260
	NR	Present Perfect	983.60	0.137	0.575	1094.90	0.040	0.872
	NR	*Perfectives together*	*1273.50*	*−0.117*	*0.633*	*987.76*	*0.134*	*0.586*
	NR	Imperfect	781.66	0.314	0.190	1045.50	0.083	0.736
	NR	Present	979.07	0.141	0.564	1269.10	−0.113	0.644
	NR	Other	1373.50	−0.205	0.400	1228.20	−0.077	0.753
	SI	Preterite accept	2424.40	0.068	0.748	1968.00	0.243	0.242
	SI	Imperfect reject	2593.90	0.002	0.991	2443.90	0.126	0.654
Habitual	NR	Imperfect	590.47	0.276	0.283	505.20	0.381	0.132
	NR	Preterite	1058.60	−0.297	0.247	868.11	−0.064	0.808
	NR	Present	809.84	0.008	0.977	1015.60	−0.245	0.344
	NR	Other	861.75	−0.056	0.831	937.69	−0.149	0.568
	SI	Imperfect accept	1897.60	0.062	0.777	1569.10	0.225	0.303
	SI	Preterite reject	1994.40	0.015	0.947	2300.90	−0.137	0.534
Continuous	NR	Imperfect	563.14	0.506	0.027	638.86	0.440	0.060
	NR	Preterite	1771.90	−0.554	0.014	1215.60	−0.066	0.788
	NR	Present	1606.90	−0.410	0.082	1630.30	−0.430	0.066
	SI	Imperfect accept	3196.20	−0.390	0.060	2129.70	0.074	0.731
	SI	Preterite reject	2300.00	0	1.000	2372.10	−0.031	0.884
Prog.	SI	Imperfect accept	2238.10	−0.106	0.631	1237.30	0.389	0.067
	SI	Preterite reject	2183.40	−0.079	0.721	1992.80	0.015	0.944
Imperfective	NR	Imperfect	580.28	0.491	0.033	617.54	0.458	0.048
	NR	Preterite	1511.10	−0.326	0.174	1308.70	−0.148	0.546
	NR	Present	1389.70	−0.219	0.368	1465.10	−0.285	0.237
	NR	Other	1224.5	−0.074	0.763	1302.50	−0.143	0.560
	SI	Imperfect accept	3504.30	−0.348	0.088	2332.60	0.103	0.625
	SI	Preterite reject	2505.20	0.036	0.863	2480.80	0.007	0.972

Details on how each value was calculated are provided in Section 5.4.4. The participants' individual relative output rates and individual speech rates, alongside measures of the central tendency of the group, can be found in Table 5 and Table 6 respectively. The correlation coefficients suggest that there was a meaningful relationship between relative output and ten of the contexts under investigation, and between Spanish speech rate and seven of the contexts. This is greater than the number of contexts for which a meaningful relationship was observed for

the measures of input quantity, but less than those observed for test age. One noticeable difference is that many sizeable correlations are observed for continuous contexts, which was not the case for any of the other variables. I consider each of the two variables in turn.

6.5.3.1 The role of relative output

Increased relative output was positively associated with expected small increases in the use of the Imperfect in habitual contexts and imperfective contexts overall, as well as with a moderate increase in the use of the Imperfect in continuous contexts. There were similarly expected negative associations with a small decrease in the use of the Preterite in habitual contexts and moderate decreases in the use of the Preterite and Present in continuous contexts. However, there were also unexpected small associations between increased relative output and increased use of the Imperfect in perfective contexts, and increased relative output and decreased accuracy accepting the Imperfect in continuous and imperfective contexts overall.

The children whose parents allow extension of the Present Perfect into recent perfective contexts had a moderate positive association for use of the Preterite ($r_s = 0.480$, $p = 0.135$), a strong negative association for use of the Present Perfect ($r_s = -0.643$, $p = 0.033$), and a small positive association for acceptance of the Preterite ($r_s = 0.343$, $p = 0.211$). Each of these would be expected, however there was also a moderate positive association between relative output and the use of the Present ($r_s = 0.403$, $p = 0.219$). For the children whose parents did not allow extension of the Present Perfect into recent perfective contexts, the only meaningful association was for their acceptance of the Preterite, for which there was an unexpected small negative association ($r_s = -0.320$, $p = 0.368$).

In spite of the small number of unexpected correlation coefficients observed within these sub-groups and for all of the children in the majority of the contexts, it is nevertheless clear that relative exposure is a relatively good predictor of heritage speakers' outcomes. This is especially clear for production rates of the various morphemes in continuous contexts.

6.5.3.2 The role of proficiency

Proficiency, as measured by Spanish speech rate, was only associated with expected small increases in the use of the Preterite in perfective contexts and of the Imperfect in habitual contexts, as well as moderate increases in the use of the Imperfect in continuous and imperfective contexts. It was likewise associated with a small decrease in the use of the Present in imperfective contexts, reflecting a moderate decrease in the use of the Present in continuous contexts specifically. In the semantic interpretation task, the only association between accuracy

and Spanish speech rate was a small positive association between increase speech rate and increased accuracy accepting the Imperfect in progressive contexts.

The correlation coefficients for the sub-groups based on regional variation in perfective contexts are somewhat similar to those observed for relative output. Children whose parents allow the extension of the Present Perfect have a strong positive correlation for use of the Preterite (r_s = 0.880, $p < 0.001$)), a strong negative association with use of the Present Perfect (r_s = −0.723, p = 0.012), and small negative associations for use of the Imperfect (r_s = −0.263, p = 0.434) and the Present (r_s = −0.300, p = 0.370). They also have a moderate positive correlation for acceptance of the Preterite (r_s = 0.459, p = 0.085) in the semantic interpretation task. However, there was also an unexpected small positive association for use of 'other' verb forms (r_s = 0.300, p = 0.370). Children whose parents do not extend the Present Perfect had an expected small negative correlation with use of 'other' verb forms (r_s = −0.327, p = 0.429), but unexpectedly also had a small positive association with increased use of the Present (r_s = 0.343, p = 0.406) and a moderate positive correlation with use of the Imperfect (r_s = 0.483, p = 0.225) in perfective contexts.

Across the sub-groups and for the whole set of children, the correlation coefficients show that Spanish speech rate is generally well associated with the use of the various morphemes and accuracy in the semantic interpretation task. For the whole group, none of the correlation coefficients were unexpected, although some of them were within the sub-groups, especially for the children whose parents do not allow the extension of the Present Perfect into recent perfective contexts.

6.5.3.3 Summary

Both of the measures of language activation tested here are generally well correlated with the heritage speakers' grammatical outcomes, in line with Putnam and Sánchez's (2013) claim that this would be the case. This was especially true for continuous contexts in the production task, in which both variables were clearly associated with increased use of the Imperfect and decreased use of the alternative verb forms, especially for relative output. There is generally less of an association between these two measures of language activation and accuracy or usage rates in perfective and progressive contexts, although given that neither of these should be affected by the activation of the competing representation from English, this is not surprising. What is surprising is the fact that there was only a slight association between either of the variables and usage rates in the habitual contexts.

6.6 Summary

Throughout this chapter, I have presented and analysed the results of the production task and semantic interpretation task for the children and parents in the present study. The evidence from both tasks suggests that there is not systematic divergence from the expected native speaker norms for the parents, however there was a high degree of heterogeneity in the heritage speakers' scores, with the child participants typically spread across a range from 0% to 100% accuracy in the contexts examined here.

In the narrative retelling task, the parents consistently used the appropriate verb form more than any other verb form in contexts, with occasional use of the Present and Imperfect in perfective contexts being indistinguishable from non-use of 'other' verbs forms, and the use of the Present not dissimilar from non-use of the Preterite in any of the imperfective contexts. In perfective contexts, the children used the Preterite more than any other form, the closest of which was the Present Perfect, which they used more than other alternatives. This use of the Present Perfect reflects an extension of an ongoing change in the baseline variety for some children. In habitual contexts, the children as a group did not distinguish between use of the Present and Imperfect, but did use the Imperfect more than the remaining verb forms. In continuous contexts, the children were more likely to use the Imperfect than any other form, and they only used appropriate imperfective forms in progressive contexts. The children's use of the Preterite in perfective contexts and appropriate imperfective forms in progressive contexts was not distinguishable from their parents, but they used the Imperfect less than their parents did in habitual and continuous contexts, with concomitantly higher use of the Present in both of these contexts, and the Preterite and 'other' forms in habitual contexts as well.

Consequently, the production data clearly shows that the children diverge from the baseline grammar as represented by their parents, specifically in habitual and continuous contexts. Moreover, the evidence suggests that this divergence manifests through the use of the Present in lieu of the Imperfect in both of these contexts.

The data from the semantic interpretation task is a little more interesting, as the children's overall performance is generally similar across each of the contexts, with generally high acceptance of the appropriate morpheme and slightly lower rejection of the inappropriate morpheme. Rejecting the Preterite in continuous contexts was especially lower than the other rejection rates, but not statistically different to the other imperfective context types. However, the children were mostly less accurate than their parents in both accepting the appropriate morpheme and rejecting the inappropriate morpheme. The only exceptions to this are that the children are equally accurate at

accepting the Imperfect in habitual and progressive contexts, and equally reject the Preterite in habitual contexts.

Analysis of the relationships between various predictor variables and the heritage speakers' usage and accuracy rates for the various morphemes in the different contexts was conducted using Wilcoxon tests for categorical variables and Spearman's rank correlations for continuous variables. With the exception of participants' age at time of testing, none of the confounding variables had a systematic relationship with accuracy and usage rates. These variables included the number of Spanish-speaking parents, the country of birth, child birth order within the family, and input quality. Whilst cumulative exposure and relative exposure, measures of input quantity, had more reliable associations with the children's rates than these variables, the associations were not systematic. Relative output and Spanish speech rate, measures of language access, both had more systematic associations with the children's rates, which was especially the case for continuous contexts. Nonetheless, the best overall predictor variable was the children's age at time of testing. In the next chapter, I discuss these findings with respect to the research questions and literature in the field.

Chapter 7 Discussion

7.1 Introduction

In this section, I discuss the results of the empirical investigation presented in Chapter 6 in relation to the specific research questions under investigation in this study and the broader context of heritage language acquisition. The chapter is structured as follows. I begin in Section 7.2 by considering how the results answer the three research questions. Then, I ascertain how the data from the study support and challenge the model of Revised Feature Reassembly proposed by Putnam and Sánchez (2013), and the theoretical implications this has for modelling heritage language acquisition. In the following section, I briefly remark upon the contribution these results make to additional debates in the field of heritage language acquisition. In Section 7.5, I discuss limitations of the research project and the data. Finally, Section 7.6 constitutes a summary and conclusion of the dissertation.

7.2 The results in relation to the research questions

The main goal of this thesis is to investigate Putnam and Sánchez's (2013) model of Revised Feature Reassembly for understanding heritage language acquisition. I have done so by examining the acquisition of viewpoint aspect by Spanish heritage speakers in the United Kingdom. The study addresses the following research questions:

1. How are the features associated with viewpoint aspect assembled in the Spanish grammars of heritage speakers and baseline speakers in the United Kingdom?
2. In the case that the heritage speakers' assembly of viewpoint aspectual features diverges from the baseline grammar, how is this divergence manifested?
3. What is the role of the input and language access in the acquisition of viewpoint aspect in the heritage speakers' grammars? Specifically, to what extent are measures of language access better at predicting heritage speakers' accuracy than measures of language input?

In order to achieve this goal and answer these questions, I adapted the *Cat Story* oral narrative retelling task and a bimodal semantic interpretation task from the Spanish Learner Language Oral Corpus (SPLLOC: Mitchell et al., 2008; Domínguez et al., 2013), which both focus on the expression of and interpretation of aspectual verb forms. I also used the Bilingual Language Experience Calculator (BiLEC: Unsworth, 2013) to measure various characteristics of the input environment the children are exposed to.

The results, recounted in the previous chapter, showed that the children differ from their parents in a number of ways in the two tasks. In the narrative retelling task, several children unexpectedly used the Present Perfect as a perfective marker in perfective contexts, and used the Present in lieu of the Imperfect in habitual and continuous contexts, also using the Preterite and 'other' verb forms to a high degree in the habitual contexts, although they only used appropriate forms in progressive contexts. Overall, I observed that the children were most accurate in progressive contexts, followed by perfective contexts, then continuous contexts, and least accurate in habitual contexts. The parents, however, were highly accurate in all contexts, with only 12 unexpected tokens across more than 500 contexts.

In the semantic interpretation task, the parents were generally highly accurate, although their accuracy rates were slightly lower for habitual contexts and for rejecting the Preterite in progressive contexts. The children were consistently more accurate at accepting the appropriate morpheme than rejecting the inappropriate morpheme in each context, with slightly greater difficulty rejecting the Preterite in continuous contexts compared to all other contexts, although this was not statistically significant. However, as a group the children were statistically less accurate than their parents were at accepting the appropriate morpheme.

Further analyses of the children's use of each verb form in each context and their accuracy rates in each condition of the semantic interpretation task were also carried out to assess the relationship of various explanatory variables. Whether or not the child was born outside the United Kingdom, the number of Spanish-speaking adults in the household, and children's birth order within the family were all found to have no systematic relationship with the results. Correlation analyses also showed that there was very little effect of input quality on the results. Assessing the effects of input quantity, cumulative exposure was associated with only three accuracy and usage rates, and relative exposure was associated with four accuracy and usage rates. Thus, neither of them was useful for predicting the heritage speakers' divergence from the baseline. As for the measures of language access, relative output in Spanish was associated with ten of these rates, and Spanish speech rate was associated with seven rates. Finally, the participants' age at time of testing was associated with thirteen rates, which means that it was the best predictor of participants' accuracy in the semantic interpretation task and usage of appropriate verb forms in the production task. I now consider how these results relate to the specific research questions in turn.

7.2.1 Assembly of viewpoint aspect features to morphological forms in the heritage speakers' and baseline speakers' grammars

Under Feature Reassembly, the most vulnerable contexts for the expression of viewpoint aspect in the Spanish grammars of the heritage speakers and baseline speakers are expected to be habitual and continuous contexts. Whilst their performance in the semantic interpretation task is not entirely at ceiling in the habitual and continuous conditions, the production data clearly shows that none of the parents systematically behaved in a way that suggested that they did not associate the Preterite with perfective aspect, or the Imperfect with the habitual, continuous and progressive readings of imperfective aspect. As such, I conclude that the baseline grammar of the parents in this study has not gone under reassembly due to the influence of English, and matches the standard Spanish assembly as diagrammed in Figure 15.

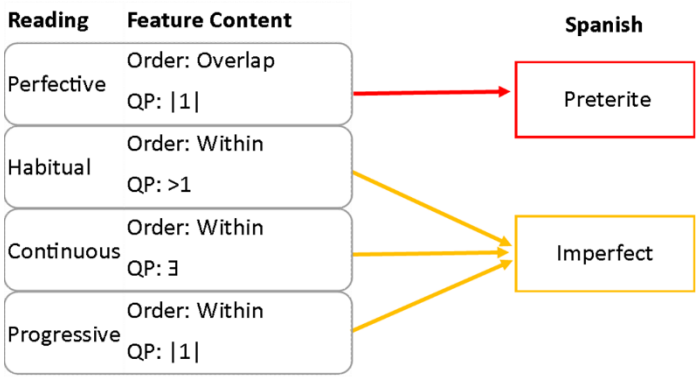


Figure 15: The feature assembly of viewpoint aspect in the parental baseline grammars, in line with the monolingual distinction elaborated by Arche (2014)

The data from both the production and comprehension tasks show that a number of children behaved indistinguishably from the parents, and as such these children will have a similar target-like representation of viewpoint aspect as represented in Figure 15. However, the children were highly heterogeneous, with a wide range of accuracy and usage rates in every context and condition, and so not all of them were similar to the baseline in this way. It is widely recognised that heritage speakers are a heterogeneous population (e.g. Lohndal *et al.*, 2019), and so this finding is not a surprise.

Data from the production task showed that the children were not significantly different overall from their parents in associating perfective and progressive contexts with perfective and imperfective forms respectively. However, a substantial number of children systematically used the Present Perfect as a perfective marker in lieu of the Preterite. Although recent perfective uses of the Present Perfect are possible in the baseline grammar of some of the children, no parents used the Present Perfect in the historic perfective contexts of the *Cat Story*, so this use of the

Present Perfect by some of the children constitutes a grammatical innovation, as they are extending a change from the baseline grammar. This is similar to the process of extension of changes observed by Silva-Corvalán (1994) across multiple generations of Mexican American Spanish speakers in Los Angeles. However, it is unclear whether the children are using the Present Perfect as a strategy to simplify the complexity of the inflectional paradigm or due to there being insufficient evidence that use of the Present Perfect is highly constrained in the parents' grammars. Children within the same family often behave entirely differently, such as children SC23 and SC24 quoted in Section 6.3.1 who both performed at ceiling in other contexts and only differed with respect to whether they treated the Preterite or the Present Perfect as an appropriate perfective marker in these distant contexts. In view of this difference, I am inclined to prefer the argument that the evidence in the input is likely to have been insufficient for the distinction to be perceived by some children, rather than that a small group of children would simplify the grammar in this way but not others. This treatment of the Present Perfect as the only marker of perfectivity is schematised in Figure 16.

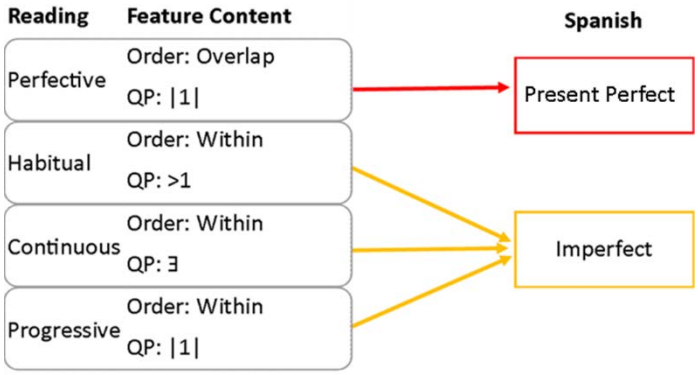


Figure 16: The feature assembly of viewpoint aspect in the grammars of certain heritage speakers, who treat the Present Perfect as a general perfective marker in lieu of the Preterite

In view of the fact that the Present Perfect is an appropriate perfective marker in the relevant baseline grammars, even though the children who use it in the study do so in a novel way, I have treated this behaviour as appropriate association of a perfective form to perfective meaning. When it comes to habitual and continuous contexts, substantial numbers of the children differed from their parents in associating imperfective forms with habitual and continuous contexts. This divergence from the baseline grammar in production in habitual and continuous contexts, in contrast with perfective and progressive contexts, is consistent with Feature Reassembly. Whilst L2 learners find the continuous reading especially difficult (Domínguez, Arche & Myles, 2017), the heritage speakers in this study had greater difficulty with the habitual contexts, which may reflect the fact that continuous aspectual meaning is usually associated with stative verbs, for which

heritage speakers often only know the Imperfect form (Silva-Corvalán, 1994, 2003, 2014). Typically, this divergence manifests in the use of the Present, as schematised in Figure 17.

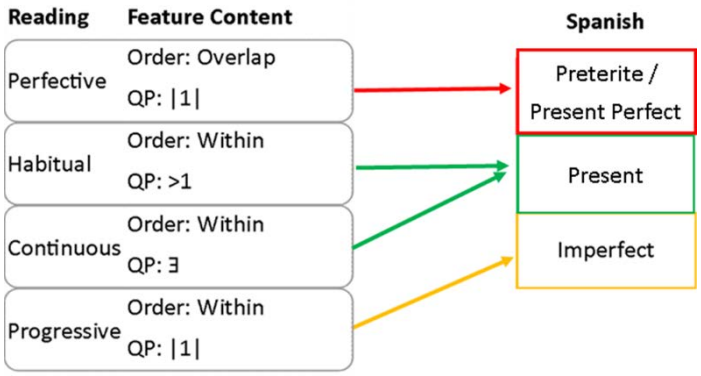


Figure 17: The feature assembly of viewpoint aspect in the grammars of certain heritage speakers, who use the Present to express continuous and habitual meaning

In terms of viewpoint aspect, the Present is an imperfective form, and it is therefore possible to construe the association of the Present with past habitual and continuous readings as evidence for the acquisition of the appropriate viewpoint aspect relationship. However, in Spanish the Present also functions as a default verb form. For the purposes of this question, it is irrelevant whether the use of the Present in lieu of the Imperfect as either reliance on a default verb form or suppliance of the best non-Preterite form available in the grammar. I return to consider this theme and whether the data allows us to disentangle the two potential sources of the use of the Present in the absence of a clear developmental trajectory momentarily in Section 7.2.2.

The data from the semantic interpretation task is a little more complex to interpret clearly, as the children are generally similarly accurate across all conditions as a group, with the group average resting above chance but typically substantially lower than the parental baseline. Under a feature-based account, we would expect relatively target-like behaviour in the perfective and progressive contexts, with heterogeneity only visible in the habitual and continuous contexts. Generally lower rates of accuracy rejecting the inappropriate verb form can be explained given heritage speakers' known aversion to rejecting verb forms (Polinsky & Scontras, 2020), and also partially reflect an age-related effect (Ambridge & Rowland, 2013). However, an exception to this is observed in the further reduced rejection of the Preterite in continuous contexts; given the expected difficulty in associating the Imperfect with continuous meaning under influence from English in a Feature-based account. As such, this finding is entirely consistent with Feature Reassembly.

Another possible explanation for the generally similar behaviour across conditions even though I expected comparatively lower rates of accuracy in habitual and continuous contexts is that the task was too complex for the younger children. Age at time of testing was typically relatively

strongly associated with increased accuracy for both accepting the appropriate morpheme and rejecting the inappropriate morpheme, and there is therefore clearly merit in this interpretation of the data. As such, I dedicate Section 7.5.2 to discussing this limitation of the study. However, the data also shows that there is something more complex going on as well; the youngest child in the study (SC12, 5;5) generally accepts both morphemes in all four context types, but so does one of the children above the median age (SC3, 10;10). A potential further source of the discrepancy between the production and interpretation data is the children whose recordings of the *Cat Story* narrative were provided entirely in the Present tense. For them, it was unclear whether they were deliberately telling the story as a present narrative or intending past reference without the morphological tools to do so. In view of the ambiguity of intended temporal reference, or lack of verbs altogether, these children are not included in calculating the usage and accuracy rates for the production data, but their responses to the semantic interpretation task are included alongside the other children. The unexpected heterogeneity in even perfective and progressive contexts may therefore reflect a subset of children whose grammars are comparatively unstable compared to the children who used unambiguous past reference in at least one context in the narrative retelling task.

In sum, the answer to the first research question investigated in this thesis is that the features associated with viewpoint aspect are assembled similarly to monolingual varieties of Spanish in the baseline speakers. By way of contrast, there was a high degree of heterogeneity in the children's results, showing that some of them had assembled the features of viewpoint aspect in line with the baseline assembly, whereas others diverged in a variety of ways. The divergence primarily manifested in two ways: the use of the Present Perfect as a perfective marker in lieu of the Preterite; and the use of the Present to express the habitual and continuous readings of the Imperfect. In view of the second research question focusing on the nature of the divergence, I consider this further now.

7.2.2 Divergence of the heritage speakers' grammars from the baseline grammars

As established throughout Section 7.2.1, the heritage speakers' grammars diverge from the baseline grammars in two principal ways. First, a sub-group of children whose parents allow the extension of the Present Perfect into recent perfective contexts extended this change and used the Present Perfect as a general marker of perfectivity in lieu of the Preterite. Second, a substantial number of children used the Present instead of the Imperfect in habitual and continuous contexts, indicating difficulty assembling these meanings onto the Imperfect verb form. I will discuss each of these two divergences in turn.

The use of the Present Perfect as a perfective marker in recent past contexts has been established for most European varieties and some Latin American varieties of Spanish, including north-western Argentina (see discussion in Section 3.5). Several of the families in this study were of Spanish origin, and in one family, the mother was from a province in northwest Argentina. Of nineteen children who produced perfective contexts in the narrative retelling tasks, eleven were in families where the baseline variety had this extension and eight were in families where the extension was not present. None of the children in the non-extending variety group used the Present Perfect as a perfective marker, but seven of the eleven children in the extending variety group did, four of whom did so more than half the time. Consequently, it is clear that this grammatical divergence only takes place when the baseline variety provides evidence that the Present Perfect can be used to mark perfectivity, even though the grammar does not allow use of the Present Perfect in the way that the children use it in the recordings.

Recall that Silva-Corvalán (1994) posited three main sources of change in the second and third generation speakers of Los Angeles Spanish in her study: transfer from English; simplification of inflection to reduce computational complexity; and extension of ongoing changes in the baseline variety. Whilst English has an equivalent Present Perfect verb form, the grammatical change in which it can be used to express recent perfective meaning is only taking place in Spanish[19], and therefore transfer from English cannot be the source of the extension of the Present Perfect into the distant perfective contexts here, unlike for the French dominant heritage speakers studied by Markle LaMontagne (2016). This leaves reduction of computational complexity and diachronic extension of the change as the potential sources for this divergence in the heritage speakers' grammars. Other Romance languages, such as French and Italian, have undergone or are undergoing a process in which the Present Perfect replaces the Preterite equivalent (e.g. Bybee, 1994: 249), and therefore it is plausible that this same process is diachronically taking place in the regions in which the use of the Present Perfect for recent perfectives is allowed (Schwenter & Torres Cacoullos, 1994).

Thus, it is entirely plausible that the use of the Present Perfect by some of the children in the study represents the logical endpoint of the change that is present in the baseline grammar. This fits with the widespread idea that children are at the forefront of language change (e.g. Lightfoot, 2010), and Silva-Corvalán's (1994) observation that this process of extension may be accelerated in language contact situations. However, under this analysis I would expect to see a more uniform following of the 'perfect path'. For instance, I observe children within the same family who

[19] There is evidence for a similar change in Australian English (e.g. Engel & Ritz, 2000), but this is not the variety the children are exposed to in the context of this study.

consistently use different forms to express perfectivity, including SC23 and SC24, and it is unlikely that one would passively extend a language change while the other did not. Moreover, the correlations suggest that the use of the Preterite increases with age (r_s = 0.648)[20], both cumulative and relative exposure (r_s = 0.648 and r_s = 0.315, respectively), relative output (r_s = 0.480) and Spanish speech rate (r_s = 0.880). Consequently, I am inclined to view this divergence as the children attempting to reduce the complexity of the expression of perfective aspect in their grammatical system. The varieties which allow extension of the Present Perfect into recent perfective contexts are more complex, as they subdivide the concept of perfectivity, and have a one-many and many-one mapping for the Preterite form and recent perfective, as schematised in Figure 18.

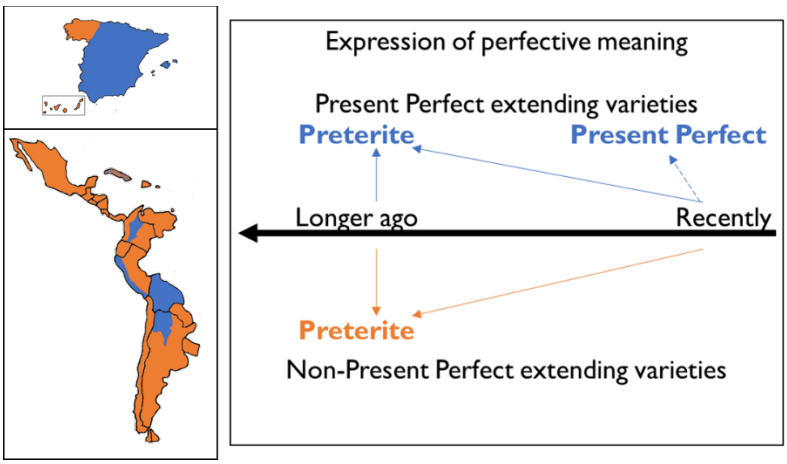


Figure 18: Form-meaning mappings in the expression of perfective meaning in two types of Spanish grammar

Since the recent-historic distinction is not relevant for the non-extending varieties, the only mapping is perfective to Preterite, whereas in the extending varieties, perfective meaning is subdivided and the mappings are recent perfective to Present Perfect, recent perfective to Preterite and historic perfective to Preterite. As such, the computational complexity of the Present Perfect extending varieties is greater than that of the non-extending varieties. Assuming a model such as Yang's (2002) tolerance and sufficiency principles of variational learning, all that is necessary for the Present Perfect to be preferred by children who want to enforce uniformity on the grammar is for recent perfective contexts to predominate in the input, and for the Present Perfect to be used more than the Preterite in these contexts. I think it is reasonable to assume

[20] I discuss age in more detail in Section 7.5.1, but the stronger correlation between age and use of either perfective form (r_s = 0.727) suggests to me that this correlation is likely to reflect slightly protracted acquisition of the association between perfectivity and a perfective form, rather than with the Preterite per se. A similar pattern is not observed for the other variables here, as detailed in Section 6.4.2 and Section 6.4.3.

that a larger proportion of parent-child interaction will concern recent past than historic past, but this is speculation. What is clear is that there is a small preference for the Present Perfect in European varieties that allow its use in perfective contexts. Recall that González, Jara Yupanqui and Kleinherenbrink (2018) found that Spaniards slightly preferred the use of the Present Perfect to the Preterite, at 52.1%, whilst Peruvians preferred it in only 41.5% of contexts and Argentinians only preferred the Present Perfect in 10.6% of contexts. Unfortunately, the authors do not specify which specific regions their participants were from, but it is clearly not unreasonable to assume that the Present Perfect could be marginally more prevalent in the input that these children receive and that forms the basis of their acquisitional intake.

The reduced complexity of the divergent grammar would explain why the correlation coefficients show that the children with lower access to and input in Spanish use the Present Perfect in this way but those with higher levels of access and input do not. If the fine-grained distinction is not necessary based on the evidence available as perceptual intake, the child acquires the less complex grammar; where the child has sufficient evidence that the distinction is grammatically relevant, the grammar is updated accordingly. As such, I postulate that the use of the Present Perfect as a general perfective marker in the grammars of some of the heritage speakers reflects both the distribution of the forms in the input and the acquisitional pressure to produce as economical a grammar as possible. Consequently, this divergence from the baseline grammar is primarily driven by the acquisition process.

I turn now to the difficulty some of the heritage speakers had associating the Imperfect to its habitual and continuous readings. As outlined above, this difficulty manifested through use of the Present, rather than use of the Preterite. This is not strictly speaking the expected manifestation of vulnerability given the Feature Reassembly hypothesis, under which I would have predicted substantial use of the Preterite, but the use of the Present is not inconsistent with the hypothesis. Certainly, the fact that the statistically increased use of the Present is confined to continuous and habitual contexts is entirely in line with the predictions of Feature Reassembly, but there are two possible interpretations of the use of the Present. These interpretations are firstly that the use of the Present reflects an online constraint using the Spanish representations, or secondly that the use of the Present reflects non-target-like Spanish representations in the heritage speakers grammars. As laid out by Perez-Cortes, Putnam and Sánchez (2019), it is plausible that heritage speakers may be at different stages of reassembly in comprehension and production in the originally proposed model (Putnam & Sánchez, 2013)

On the basis of the production data alone, it is impossible to adjudicate between these two positions. However, the comprehension data from the semantic interpretation task does shed

some light on the suitability of the two interpretations. In the production task, most children associated perfective meaning with perfective morphology and progressive meaning with imperfective morphology, whilst many of them did not associate habitual and continuous meaning with imperfective morphology. However, in the semantic interpretation task, the overall accuracy rates for accepting the Imperfect are strikingly similar for all three of the imperfective readings, and likewise similar to the rates for accepting the Preterite in the perfective contexts. In other words, the data from the semantic interpretation task suggest that at least some of the children who struggle to associate the Imperfect with habitual and continuous meaning in the production task nonetheless have a more stable representational association of the form and meaning, with fewer children exhibiting difficulty in both the production and comprehension task.

This behaviour is consistent with Putnam and Sánchez's (2013) four stages of Feature Reassembly, in which they argue that difficulty accessing the heritage language will manifest in production difficulties before representational change occurs. Conversely, if the use of the Present reflects a difficulty associating the meanings to the representation, I would expect to see greater instability at the representational level. Therefore, I view a performance-based constraint as a more probable explanation for the use of the Present than a representational issue per se.

For me, an additional question centres on whether the production difficulty, and representational instability in some cases, reflects a process of restructuring or indicates that the children in question never converged on the baseline representation in the first place. In other words, this data could indicate either that the specific children had never acquired a stable mastery of the Preterite-Imperfect distinction in Spanish, a case of incomplete acquisition, or that these children had had this knowledge and that their current state exemplifies a grammar that has undergone or is about to undergo restructuring. Without longitudinal data for the children, it is impossible to disentangle precisely which of these two phenomena is taking place here. However, the correlations with age at time of testing shed some light on this matter.

Recall that age at time of testing was the most widely predictive variable in the study for increased accuracy and appropriate usage rates. In other words, older children had higher accuracy rates than younger children, and were more likely to use the expected form in a context than younger children. Since L1 acquisition research shows that the perfective-imperfective distinction in comprehension becomes adult-like from around age 5 or 6 (Hodgson, 2005; Garcia del Real Marco, 2015), the correlations with age provide clear confirmation of the expected bilingual delay in heritage language acquisition (Polinsky & Scontras, 2020: 13). However, the association of age with increased accuracy is not perfect, and some children, particularly clustered

around the age of ten in the production data, behaved similarly to the younger children, and in some cases these children were less like the baseline speakers than the younger children.

To take a concrete example, consider the use of the Imperfect by children in both perfective and imperfective contexts. Spearman's rank correlation showed a moderate negative correlation for age in perfective contexts ($r_s = -0.404$, $p = 0.086$), showing that younger children were less likely to use the Imperfect to express perfectivity than older children. Figure 19 visualises the individual rates of use of the Imperfect in perfective contexts.

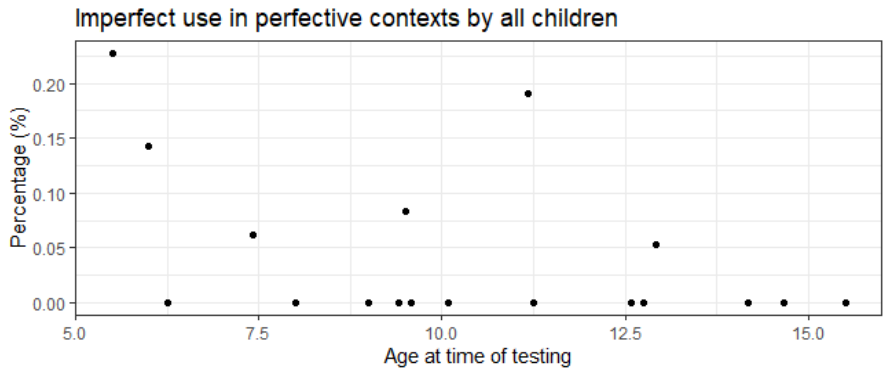


Figure 19: A scatterplot showing the children's use of the Imperfect in perfective contexts.

There is a clear progression from relatively high use of the Imperfect by most children younger than 7;6 to relatively stable non-use of the Imperfect by children older than 7;6. However, three children older than 7;6 produce the Imperfect in perfective contexts at similar rates as younger children. Since this behaviour is unlikely to result from direct influence of English, I find it more plausible to explain this specific instance of divergence to fossilization in the heritage speakers' grammars. In imperfective contexts, there is a small positive association between age and use of the Imperfect, ($r_s = 0.253$, $p = 0.296$). Inspection of the individual data points in Figure 20 exemplifies the generally greater difficulty of the Imperfect for the children, but also shows that the children who struggle most with associating the Imperfect to the difficult habitual and continuous readings are not the youngest ones, but rather a group in the middle.

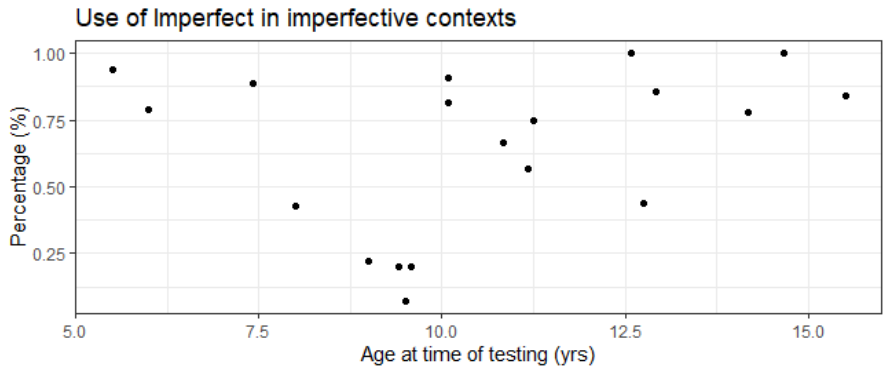


Figure 20: A scatterplot showing the children's use of the Imperfect in imperfective contexts.

Consequently, in my estimation it is much more probable that difficulty associating the Imperfect with imperfective meaning constitutes a restructuring of the grammar following influence from English. The point of comparing the usage rates of the Imperfect in these two context types is simply to illustrate that multiple routes to divergence from the baseline can take place within the same grammar. In the case of using the Imperfect in perfective contexts, the divergence is more likely to reflect continuing instability, whereas difficulty using the Imperfect in imperfective contexts is more likely to result from a restructuring of the grammar. Since the data in this case are not longitudinal, this interpretation comes with the large caveat that the specific children may have behaved differently from the younger members of the study when they were younger, and likewise the younger members of the cohort may behave differently from the older ones as they get older.

Use of the Imperfect in imperfective contexts naturally precludes use of the Present, and it is therefore probable that the pattern of Present use in habitual and continuous contexts will similarly show relatively low incidence at younger ages with some older children using it more as well. The scatterplots in Figure 21 and Figure 22 confirm that the use of the Present is generally consistent at low levels in both context types, with some individuals using increased amounts of the Present from around age 9, implying that this specific divergence obtains through restructuring of the grammar. Individual summaries of the tokens used by the children are given in Section 6.4, but it is worth highlighting that the smallest number of habitual and continuous contexts for a child who exclusively used the Present was three, providing substantial evidence that this behaviour is likely to be systematic.

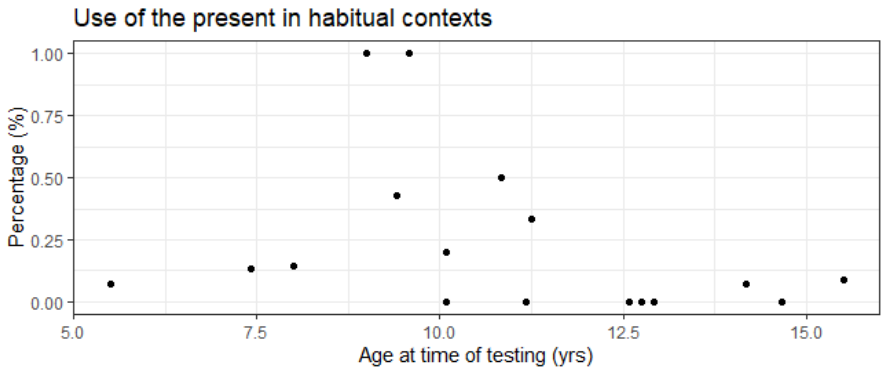


Figure 21: A scatterplot showing the children's use of the Present in habitual contexts.

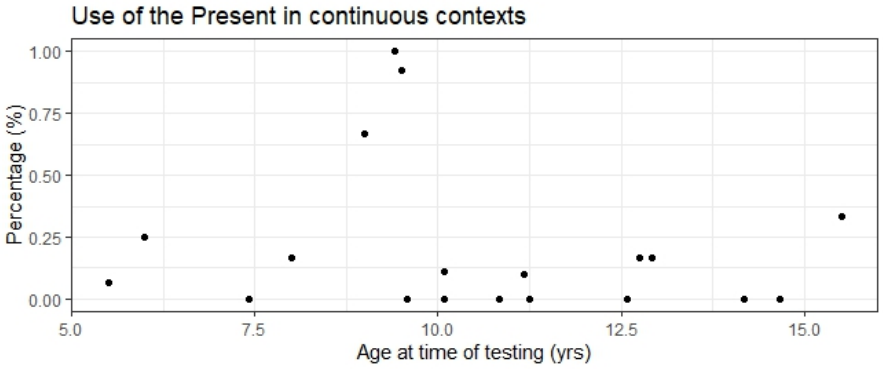


Figure 22: A scatterplot showing the children's use of the Present in continuous contexts.

As already highlighted, an inference from the distribution of this data is that this use of the Present constitutes a restructuring of the grammar or specific production constraint. In order to tease these two possibilities apart, comparing individuals' production rates and accuracy rates in the semantic interpretation task is necessary. In Table 33, I present the individual usage rates of the Present and Imperfect, and accuracy ratings for the Preterite and Imperfect in habitual and continuous contexts for the individuals who used the Present more than 25% of the time in either of these contexts. This threshold represents the highest usage rate by one of the youngest children.

Table 33: Individual ratings on the comprehension task for individual children who used the Present at greater rates than the younger children.

	Habitual contexts				Continuous contexts			
Participant	Present use	Imperfect use	Preterite rating	Imperfect rating	Present use	Imperfect use	Preterite rating	Imperfect rating
CC02	100	0	100	100	67	33	100	100
SC05	09	91	100	100	**33**	**67**	**33**	**33**
SC09	33	0	67	67	**0**	**100**	**33**	**33**
SC13	**50**	**50**	**33**	**100**	0	100	67	100
AC15	**43**	**29**	**33**	**33**	**100**	**0**	**33**	**67**
SC19	100	0	67	67	0	100	100	100
MC20	-	-	**0**	**67**	92	0	67	100

Where the children were accurate on at most one item for either the Preterite or Imperfect in the semantic interpretation task, I considered this to represent divergence from the baseline, as almost all parents accurately accepted or rejected at least two items in all of the contexts[21]. These

[21] As recounted in Section 6.3.1, there were two exceptions. One parent consistently and uniquely rejected the Imperfect in progressive contexts. Another one accepted the Preterite for two items in habitual

instances are marked in bold in Table 33. As can be seen, of the five children who used the Present at high rates in habitual contexts, two could be considered to have representationally diverged from the baseline, with an additional child who did not produce any habitual contexts but almost exclusively produced the Present in continuous contexts also having low accuracy ratings in this context. Of the four children who produced the Present in continuous contexts, two appear to diverge from the baseline at the representational level, alongside one child who mostly used the Present in habitual contexts only. Whilst this individual-level interpretation can only be offered cautiously, it is entirely consistent with Perez-Cortes, Putnam and Sánchez's (2019) observation of divergence in production reflecting both online production constraints associated with early bilingualism in some grammars and representational divergence from the baseline associated with feature reassembly in other grammars.

To recapitulate, the heritage speakers in this study diverged from the baseline grammar in two ways. The first way was the extension of the Present Perfect into a general marker of perfectivity when the baseline variety allowed the use of the Present Perfect in recent perfective contexts by some of the children. Since this behaviour correlated strongly with language access measures, I concluded that this behaviour was the result of heritage speakers simplifying the inflectional paradigm in an effort reduce computational complexity, as proposed by Silva-Corvalán (1994). The second way was that a substantial number of heritage speakers used the Present to express habitual and continuous meaning instead of the Imperfect. Whilst this could reflect a performance constraint of bilingualism (Putnam & Sánchez, 2013) or an early stage of reassembly (Domínguez, Arche & Myles, 2017), the relatively consistent level of accuracy across all conditions in the semantic interpretation task led me to conclude that for most speakers in this study the use of the Present reflected a performance constraint preceding restructuring. This was backed up by only a small number of children exhibiting non-baseline-like accuracy rates in the semantic interpretation task in addition to their use of the Present. I further interrogated whether increased use of the Present by specific individuals was more likely to be the result of a restructuring process or non-acquisition of the Imperfect at younger ages. The implication of lower incidences of consistently low use of the Present at younger ages, compared to relatively high use of the Imperfect in perfective contexts by younger children, suggests that use of the Present is more likely to reflect a subsequent restructuring of the grammar.

contexts; in this case, both items were accepted by several parents individually but only this parent accepted both.

7.2.3 The role of the input and language access in heritage language development

The third research question under investigation concerned whether measures of input quantity or language access were more predictive of whether the heritage speakers' Spanish grammars would converge with the baseline grammar. In essence, the question relates the earlier claims in the field that reduced input is the principal driver of divergence in heritage language acquisition (e.g. Montrul, 2002; Silva-Corvalán, 2003), with Putnam and Sánchez's (2013) rejection of this claim in favour of their construct of language access. In the analysis of the results, I tracked two measures of input quantity, cumulative exposure and relative exposure, and two measures of language access, relative output in Spanish and Spanish speech rate.

The magnitude of the correlation coefficients suggested that cumulative exposure was meaningfully correlated with three accuracy and usage rates, relative exposure with four rates, relative output with ten rates and Spanish speech rate with seven rates. Some of the associations were unexpected, such as a moderate positive association between cumulative exposure and use of the Imperfect in perfective contexts. However, the evidence clearly suggests that the measures of language access, relative output and Spanish speech rate, are more usefully predictive for heritage speakers' accuracy than the measures of input quantity. This finding confirms Putnam and Sánchez's (2013) claim to this effect. Relative output and Spanish speech rate were also more specifically predictive of production rates in habitual and continuous contexts, which is important since these two contexts are the ones in which the greatest divergence from the baseline grammar obtained.

Putnam and Sánchez (2013) rightly point out that input alone has long been considered less important than the related construct of intake in other sub-fields of language acquisition research. Whilst traditionally prominent in the field of L2 acquisition (e.g. Carroll, 1999), the input-intake distinction has now been evoked as an explanation for incremental development of the grammar in L1 acquisition (Lidz & Gagliardi, 2015), and for the selectivity of L1 attrition (Hicks & Domínguez, 2020). Indeed, one of the reasons that Putnam and Sánchez so strongly advocate for the use of language access measures in heritage language acquisition research is that these measures offer a window onto processing capabilities in the heritage language, which in turn offers a more reliable window on how much of the input becomes intake than measures of input alone.

In answer to the third research question, measures of language access are better predictors of the outcomes of heritage language acquisition than measures of input quantity. Consequently, the results of this research project provide clear confirmation of Putnam and Sánchez's (2013) model

of heritage language acquisition, and the substantial role for measures of language access in that model.

7.3 Putnam and Sánchez's (2013) model of Revised Feature Reassembly

In the answers to the primary research questions of the research project throughout Section 7.2, I have described how the results of this study provide substantial support for Putnam and Sánchez's (2013) model of heritage language acquisition. However, aspects of the results also raise some potential challenges to their model. In Chapter 2, I raised some conceptual challenges for the application of Feature Reassembly in explaining heritage language acquisition (see Section 2.5.4). Of specific relevance to Putnam and Sanchez's model, I queried whether divergence in heritage speakers' grammar necessarily reflects a process of Feature Reassembly or an earlier difficulty in the initial selection and assembly of features.

Although it is a little unclear, Putnam and Sánchez (2013) effectively consider all representational divergence from the baseline grammar in the heritage grammar as reassembly. The four stages of Putnam and Sánchez's model are repeated below:

- Stage 1: Transfer or re-assembly of some FFs from the L2 grammar to L1 PF and semantic features which may coincide with the activation of L2 lexical items on a more frequent basis from the standpoint of linguistic production;
- Stage 2: Transfer or re-assembly of massive sets of FFs from the L2 to L1 PF and semantic features, while concurrently showing significantly higher rates of activation of L2 lexical items than L1 lexical items for production purposes (i.e., they might code-switch more than bilinguals in the previous situation);
- Stage 3: Exhibit difficulties in activating PF and semantic features (as well as other FFs) in the L1 for production purposes but are able to do so for comprehension of some high frequency lexical items; and
- Stage 4: Have difficulties activating PF features and semantic features (as well as other FFs) in the L1 for both production and comprehension purposes.

(Putnam & Sánchez, 2013: 489-490)

This position is more clearly articulated by Putnam, Perez-Cortes and Sánchez (2019: 22), who note that "according to this proposal, heritage language acquisition and further developments… of the L1/heritage grammar over the course of the lifespan are the result of the remapping of featural content (FF) to different semantic and PF-features". Elsewhere, Perez-Cortes, Putnam

and Sánchez (2019: 20-21) have added a zeroth stage to the model, at which a linguistic property of the heritage grammar is indistinguishable from monolingual native speakers.

In this section, I review the interpretation of the two main instance of divergence from the baseline grammar in the present study outlined in Section 7.2.2, and argue that some of these differences can best be explained as arising during initial feature assembly rather than as a result of feature reassembly, and that this distinction matters. Following this, I maintain that this is consistent with the broader setting of Putnam and Sánchez's model, even though it makes the 'incomplete acquisition' position, which Putnam and Sánchez argue against, a logically possible outcome of the process of heritage language acquisition.

7.3.1 Not all that differs is 'reassembly'

The first main difference between the baseline and heritage speakers in the present study was the use of the Present Perfect instead of the Preterite in perfective contexts by a large number of individuals within a sub-group. The use of the Present Perfect was strongly associated with the language access measures that Putnam and Sánchez explicitly argue predict reassembly of the heritage grammar, and a case could be made that the mapping of the perfective feature bundle to the Preterite and Present Perfect forms corresponds to Stages 0 and 1 of Putnam and Sánchez's model. Without longitudinal evidence, it is impossible to ascertain whether heritage speakers restructure their grammar by updating the form-meaning mapping or maintain the initially acquired form. However, since younger children also preferred to use the Present Perfect to the Preterite, as well as older children with lower levels of activation of Spanish, it is possible that mapping perfective to the Present Perfect constitutes an earlier hypothesis that the speaker updates when sufficient acquisitional intake indicates the hypothesis does not appropriately match the baseline grammar.

Regardless, there is no L2/2L1 influence as the phenomenon is internally motivated, and probably corresponds to distributional properties of the baseline input. Consequently, even if the heritage speakers restructure their grammars from mapping perfectivity from one form to the other, this restructuring is not an instance of Feature Reassembly as the only role of the English grammar is raising the threshold at which the baseline input becomes acquisitional intake in Spanish. As such, restructuring of the grammar in this instance reflects the expected acquisitional pathway under modern generative (and UG plus statistics) approaches to L1 acquisition.

The other major difference between the baseline and heritage speakers was the fact that some heritage speakers used the Present in lieu of the Imperfect in habitual and continuous contexts. In view of individual usage rates of the Present in the narrative retelling task and accuracy rates in

the semantic interpretation task, I suggested that this divergence reflected a performance constraint for some of the children and an early stage of reassembly of the form-meaning association for others, along the lines advocated by Perez-Cortes, Putnam and Sánchez (2019). Such a disentangling of the effects of differential access and reassembly is therefore possible under Putnam and Sánchez's (2013) model, although it is worth noting that they do so without amending the terminology of the stages to reflect the fact that online performance constraints grammar in production is not reassembly. Lardiere (2009: 218) explicitly considers processing and computational effects such as this as being outside the remit of the Feature Reassembly Hypothesis, and Perez-Cortes, Putnam and Sánchez (2019) describe this behaviour as resulting from differential access to the grammar for production and comprehension purposes. Therefore, only a small subset of the use of the Present in habitual and continuous contexts within this study represents reassembly within the heritage grammar.

In Section 7.2.2, I briefly illustrated how the use of the Imperfect in perfective contexts by some heritage speakers in the present study represented a different pathway to divergence from the baseline grammar than the reassembly evident in the use of the Present in habitual and continuous contexts. Specifically, substantial use of the Imperfect was common among children younger than 7;6 and also for a small number of slightly older children whereas the use of the Present in habitual and continuous contexts was only done by a small number of older children. In other words, it is possible that the use of the Imperfect in perfective contexts by older children reflects a non-stabilisation of the grammatical contrast between the Preterite and Imperfect in the baseline grammar, the acquisition of which is slightly protracted compared to in monolingual L1 acquisition. However, since we do not see young children extensively using the Present in habitual and continuous contexts, the use of it by older children has to reflect attrition, whether this only affects performance or the grammatical representations as well.

In sum, the data from the present study suggest that a range of different sources underpin specific manifestations of divergence from the baseline grammar by heritage speakers. In addition to the effects of both feature reassembly and differential access assumed under the model (Perez-Cortes, Putnam & Sánchez, 2013), some of the behaviour is consistent with the grammar persisting at a non-steady state beyond the initial stages of acquisition, and some is consistent with the distributional properties of the input leading to a divergent grammar. Persistence of a non-steady state is equivalent to the notion of 'incomplete acquisition', and properties of the input grammar affecting acquisitional intake is easily accounted for under an incremental model of L1 acquisition.

7.3.2 Extending the model earlier in the acquisition process

Putnam and Sánchez (2013) effectively equate heritage speakers' divergence from baseline grammars as resulting from feature reassembly after initial success in L1 acquisition. Even though their model allows for late-acquired features or feature bundles to be only "weakly activated", they assume that the initial period of acquisition has resulted in a target-like heritage grammar prior to the onset of cross-linguistic influence and reassembly under the aegis of the majority grammar (2013: 490). However, the wider literature on early bilingualism makes it clear that whilst children successfully acquire and differentiate two separate grammars, there is nonetheless substantial interaction between the grammars throughout early acquisition, as well as indirect influence (e.g. Serratrice, 2013). As such, it is unclear why heritage speakers would only diverge from the baseline grammar after the initial acquisition process has culminated, especially if, as is the case for some of the children in the current study, the children become highly dominant in English very early on in childhood.

In the context of the present study, the divergent behaviour wherein some children within a sub-group used the Present Perfect as a perfective marker was entirely consistent with Putnam and Sánchez's model, with the noticeable exception that it cannot be Feature Reassembly, as the English grammar does not directly affect the Spanish grammar. There may or may not be restructuring of the grammar depending on whether the heritage speakers perceive the distinction made between the generic perfective function of the Preterite and specific recent perfective functions of the Present Perfect in the baseline grammar and update their grammar accordingly. This is entirely consistent with a model of L1 acquisition in which inferential monitoring of the input leads to incremental development of the grammar as distinctions are first perceived then become acquisitional intake (Lidz & Gagliardi, 2015). In effect, then, this specific instance of divergence from the baseline grammar by a specific group of heritage speakers consistent with the properties of the input shows that Putnam and Sánchez's model does not just inform us about what happens to a heritage grammar after the initial stages of acquisition, but about acquisitional intake during the initial stages as well. In other words, Putnam and Sánchez's model extends to the initial stages of feature assembly and feature selection, as well as subsequent stages of feature reassembly.

In principle, this extension can then further explain the behaviour of the children in the study who used the Imperfect at low rates in perfective contexts as well. In general terms, the children younger than 7;6 who did so have plausibly not received enough evidence to stabilise the Preterite-Imperfect distinction, by around which age most children have enough acquisitional intake that perfective meaning is not mapped onto the Imperfect. However, the children older

than 7;6 who also used the Imperfect in perfective contexts did not necessarily generate enough acquisitional intake to grammaticalize the distinction, and the continued instability of the grammar in this respect may therefore reflect divergence that results from the initial stages of feature assembly rather than a subsequent stage of feature reassembly. Longitudinal data would be necessary to definitively ascertain which of the two potential pathways was used by the children in this case, but it is clear that both are logical possibilities. In Chapter 2, when I recast Domínguez, Hicks and Slabakova's (2019) four potential pathways to heritage language acquisition in Minimalist acquisitional terms, I noted that initial difficulty in feature selection or feature assembly was equivalent to the notion of 'incomplete acquisition', whereas subsequent feature reassembly was equivalent to heritage language attrition.

In Montrul's (2002) initial sketch of possible acquisitional pathways to heritage grammars that do not converge with the baseline grammar, she explicitly separates 'incomplete acquisition' and attrition because they constitute different pathways to the same divergent outcome. It is a little difficult to ascertain whether Putnam and Sánchez's (2013) consider the difference between 'incomplete acquisition' and heritage language attrition in the same way. Whilst their understanding of 'incomplete acquisition' appears to be similar, although constructed entirely using citations to Montrul's work, Putnam and Sánchez explicitly view attrition as "performance differences in a "fully acquired", mature L1 grammar due to increased exposure to an L2" (2013: 479). As such, it appears that they view 'incomplete acquisition' and 'L1 attrition' as different outcomes of heritage language acquisition[22]. Thus, whilst Putnam and Sánchez "agree with Montrul and Polinsky that both incomplete acquisition and L1 attrition can affect different grammatical features in the same individual" (2013: fn. 2), their conception of the difference between 'incomplete acquisition' and 'L1 attrition' differs substantially from the original claims of Montrul (2002) and Polinsky (2006).

Finally, it is worth highlighting that the present study was limited by only having heritage speakers who can be considered simultaneous Spanish-English or English-Spanish bilinguals. Whilst several of the children were born outside the UK, the latest onset of acquisition of English was at 1;9, below the cut-off of 2;0 at which we can consider children to be sequential bilinguals (Schulz & Grimm, 2019). It is plausible that we would see higher levels of maintenance for sequential bilinguals and child L2 learners of English suggesting that age of onset of bilingualism would be

[22] This is clearer in a more recent elaboration of their model: "Abstracting away from age-related effects that have been appealed to in order to create a dichotomy between incomplete acquisition and language attrition, Putnam & Sánchez's model interprets these effects as largely involving the same phenomenon (i.e., remapping and restructuring of linguistic information), thus viewing both of these processes as epiphenomenal." (Putnam, Perez-Cortes and Sánchez, 2019: 22-23).

associated with whether or not divergence from the baseline obtained during the initial stages of acquisition (e.g., Montrul, 2002, 2008). However, if Putnam and Sánchez's (2013) model only accounts for those bilinguals whose age of onset of bilingualism ensures that the initial stages of acquisition are at least 'weakly' completed, then it is not a model of heritage language acquisition, since heritage speakers are "a subtype of simultaneous or sequential bilinguals" (Polinsky, 2018a: 17). Moreover, an appeal to age of onset effects to account for a way in which the results of the present study differ from the assumptions of the model is incompatible if they are "abstracting away from age-related effects that have been appealed to in order to create a dichotomy between incomplete acquisition and language attrition, Putnam & Sánchez's model interprets these effects as largely involving the same phenomenon" (Putnam, Perez-Cortes & Sánchez, 2019: 22-23). As such, it is entirely consistent with the motivations and mechanisms of Putnam and Sánchez's (2013) model to assume that its relevance for acquisition outcomes begins earlier in the acquisition process than they had assumed.

If Putnam and Sánchez's (2013) model is extended to the earlier stages of heritage language acquisition, which the data from this study supports, then it becomes immediately clear that 'incomplete acquisition' is a logically possible outcome of the model. Putnam and Sánchez (2013) are correct to highlight that Montrul (e.g. 2002), Silva-Corvalán (e.g. 2018) and Polinsky (e.g. 1997) in her earlier work were wrong to attribute the differences between heritage speakers and other native speakers of a language primarily to reduced input. However, once we have shifted the locus of divergence from input quantity to activation for intake, the same distinction between initial and subsequent divergence from the baseline remains. We can continue to argue about the validity and usefulness of the term itself (as Domínguez, Hicks & Slabakova, 2019, and replies), but the sort of linguistic knowledge denoted by the notion of 'incomplete acquisition' is exhibited by some of the children in this study, and whether this outcome obtains or not is consistent with the predictions made under Putnam and Sánchez's (2013) model.

7.3.3 Summary

In this section, I have argued that Putnam and Sánchez's (2013) model of heritage language acquisition has explanatory power during the initial stages of language acquisition. Whereas they assume that heritage language acquisition differs from other instances of L1 acquisition during the later stages, the extension of the model to the initial stages was shown to be entirely consistent with the intentions of the model, and that it could then explain differences between heritage speakers and the baseline grammar that do not clearly involve a process of 'reassembly or transfer' from the majority language. Whilst this position may be controversial in some circles because it is consistent with the notion frequently described as 'incomplete acquisition', contra

one of the aims expressed by Putnam and Sánchez (2013), any controversy relating to the term is ultimately irrelevant to whether the specific pathway to divergent attainment denoted by the phrase is a logical possibility.

An elaboration of how Putnam and Sánchez's model would integrate with theoretical models of (2)L1 acquisition is outside the scope of this thesis. However, early acquired properties of the grammar are often highly frequent (Yang, 2018) and a shift towards dominance in the majority language often comes at the onset of pre-schooling (Silva-Corvalán, 2014) or schooling (Montrul, 2018). As such, the fact that heritage speakers' divergence from the baseline often manifests in later acquired properties while early stage of bilingualism are highly successful (Serratrice, 2013) is not inconsistent with a generative model of L1 acquisition in which with the effects of differences in language activation are incorporated from the outset. Further longitudinal research could fruitfully establish whether the manifestation of 'bilingual delay' for individual properties in the same acquirer's grammar at different stages can be linked to their access to the two grammars, as this would provide further evidence of whether it is appropriate to extend Putnam and Sánchez's (2013) model to the initial processes of language acquisition.

7.4 Additional contextual observations

I address a small number of additional points in this section that pertain to the wider literature on heritage language acquisition on which this study sheds some light. First of all, I compare the heritage speakers from this study in the United Kingdom to the previous research on viewpoint aspect in the grammars of Spanish heritage speakers in the United States. With this comparison in mind, I then address the potential differences between heritage speaker bilingualism in Europe and North America raised by Kupisch and Rothman (2018) among others, including the potential effect of access to schooling on heritage language acquisition and maintenance. Within this discussion, I also consider the claim made by Guijarro-Fuentes and Marinis (2011) that attitudes towards bilingualism in the United Kingdom are more facilitative for heritage speakers. After this, I remark upon the role of the Spanish speech community in heritage language acquisition and maintenance, which Cazzoli-Goeta and Young-Scholten (2011) suggested did not meaningfully exist in the United Kingdom, with associated implications for the transmission of the baseline grammar. I also relate the role of the community to Domínguez's (2013) findings for L1 attrition.

7.4.1 Comparisons to previous studies of viewpoint aspect in Spanish heritage grammars

As elaborated throughout Section 4.5, the literature on the acquisition of viewpoint aspect, specifically the Preterite-Imperfect contrast, by Spanish heritage speakers has clearly shown

vulnerability in the form-meaning associations, with the Imperfect appearing to be slightly more vulnerable, with the exception of stative verbs for which the Imperfect is often used instead of the Preterite. The study reported in this thesis confirms the general pattern of results, as I observe that the accuracy and usage rates are lowest for the Imperfect, specifically in habitual and continuous contexts. However, the major difference in the results of the present study and the previous studies is the extension of the Present Perfect into perfective contexts by several of the children.

Almost all of the experimental work with heritage speakers in the United States has exclusively looked at speakers for whom the baseline variety is Mexican Spanish (e.g. Montrul & Perpiñan, 2011; Cuza & Miller, 2015). In the sociolinguistic and naturalistic studies, in addition to descriptions of heritage speakers for whom the baseline is Mexican Spanish (e.g. Silva-Corvalán, 1994, 2003), varieties studied have included Chilean Spanish (e.g. Silva-Corvalán, 2014) and Puerto Rican Spanish (e.g. Zentella, 1997). Recall that Silva-Corvalán (2014: 268-269) even proposed that for most heritage speakers for whom a Latin American variety of Spanish is the baseline the compound perfect verb forms would be amongst the hardest forms to acquire, with the Preterite in the easiest acquired group of verb forms and the Imperfect in the third easiest group. The children in the present study from north-western Argentina and mainland Spain show that for these varieties, the Present Perfect is a much more easily acquired form, and that the appropriate use of the Preterite is likely more difficult to acquire, perhaps suggesting that the cline of difficulty proposed by Silva-Corvalán may differ between the two varieties as shown in Table 34. Overall, this finding is consistent with Pires and Rothman's (2009) appeal to the importance of accounting for differences in the input provided by different baseline varieties, even when similar form-meaning associations exist in both varieties.

Table 34: Differences in 'ease' of acquisition for different verb forms according to whether Present Perfect extension occurs in the baseline. 'Latin American' and 'European' are convenient labels for the types of varieties, see Section 3.5 for more information regarding the geographic distribution of the Present Perfect extending varieties. Following Silva-Corvalán, 2014: 268-269.

	'Latin American' baseline	**'European' baseline**
1	Present Indicative, **Preterite**, Present Participle, Imperative	Present Indicative, **Present Perfect**, Present Participle, Imperative
2	Present Progressive, Periphrastic Future	Present Progressive, Periphrastic Future, **Preterite**
3	Imperfect, Simple Future, Conditional, Present Subjunctive, Imperfect Subjunctive	Imperfect, Simple Future, Conditional, Present Subjunctive, Imperfect Subjunctive
4	**Compound perfect tenses**	(Other) compound perfect tenses(?)

It is also worth noting that the North American experimental studies were predicated upon a different theoretical understanding of viewpoint aspect, typically Giorgi and Pianesi's (1997) [±perfective] feature, under which the cross-linguistic differences between English and Spanish consist in the assembly of the [+perfective] feature within the verbal and inflection domains respectively, and the [-perfective] feature only activated in Spanish. Under this analysis, the challenge for heritage speakers of Spanish would consist of acquiring and maintaining the baseline assembly of the [+perfective] feature and selecting and maintaining the [-perfective feature]. However, under the Arche (2014) analysis of viewpoint aspect as universal series of meanings constructed from predicate ordering (Demirdache & Uribe-Etxebarria, 2000; Stowell, 1993) and event quantification (Verkuyl, 1999), the challenge comes instead from acquiring and maintaining the appropriate form-meaning mappings, with the mappings where English and Spanish differ, continuous and habitual, expected to be the most problematic.

Given the more general characterisation of the difference between English and Spanish in the [±perfective] account, studies investigating viewpoint aspect under this lens have typically targeted the expression of perfective meaning and progressive meaning as a prototypical example of the Imperfect, or else looked at very specific properties such as the interpretation of 'se' with the Preterite and Imperfect (Montrul, 2002). As such, the previous studies have often found a relatively high degree of convergence between the baseline and heritage speakers' grammars, even though they have still uncovered systematic differences in behaviour among heritage speakers. However in the present study, with the habitual and continuous readings where the greatest degree of difficulty is expected to obtain being specifically targeted, I have observed substantially higher rates of divergence within these readings, and especially for the production of the Imperfect in habitual contexts. Explicitly testing these contexts, and considering them in isolation from other imperfective contexts, has provided a more complete window into the exact manifestation of divergence between the baseline and heritage grammars.

In sum, the general patterns of results in the present study are consistent with the findings of previous studies. However, the differences between the baseline grammar of some of the heritage speakers in this study means that I have observed a specific type of divergence not witnessed in the previous studies. Furthermore, more explicitly testing different readings of the Imperfect, and comparing these as well as the overall perfective-imperfective contrast uncovered more precise areas in which the heritage speakers diverged from the baseline than had been observed in previous studies.

7.4.2 Educational access to the heritage language

Kupisch and Rothman (2018) have argued that one reason that heritage speaker studies have often uncovered divergence from the baseline whilst studies of early bilinguals have generally found convergence reflects differences in attitudes towards bilingualism, and specific minority languages, in different contexts (see also Benmamoun, Montrul & Polinsky, 2013). One area that Kupisch and Rothman (2018) identify as a general difference between the US and European contexts is often in the availability of formal educational settings in which the children can maintain and further their knowledge of the heritage language. For instance, Kupisch and Rothman (2018: 569-573) compare the outcomes of heritage speakers of French and Italian in Germany, noting that French speakers who attend a French-medium school perform similarly to French-dominant bilinguals in France, whereas Italian heritage speakers who attended German-medium schooling were not uniformly similar to Italian-dominant bilinguals in Italy. Further evidence in support of this claim is from Bayram *et al.* (2019), who found a significant effect between L1 literacy and the acquisition of passive voice by Turkish heritage speakers in Germany.

A small number of children in the present study attended community Spanish classes, but none attended Spanish medium education. Attendance at community classes contributed towards the children's input and output rates for Spanish measured in the BiLEC questionnaire, but because so few children attended these classes, I have not been able to formally compare the children who did and did not attend these groups beyond the associated difference in input quantity. Even though very few of the children in the present study received any formal Spanish instruction, a substantial number performed within the range of the baseline speakers in both the narrative retelling and semantic interpretation task. Meanwhile, some children who did attend community Spanish classes behaved differently from the baseline. One example is SC16, who used the Present Perfect to express perfective meaning. Consequently, even if formal schooling substantially favours heritage language maintenance, as the literature suggests may be the case, the evidence from this study nonetheless makes it clear that formal schooling in the heritage language is not necessary for maintenance of the baseline grammar.

7.4.3 Attitudes towards bilingualism in the United Kingdom

As an additional aside under this point, it is worth recalling that Guijarro-Fuentes and Marinis (2011) claimed that positive attitudes towards bilingualism in the United Kingdom may support the acquisition of heritage languages. Whilst this was not a focus of this study, and I did not specifically measure attitudes towards bilingualism or Spanish, some of the data clearly contradicts this claim. Not only do I observe a relatively wide range of outcomes, similar to what

has been observed in the USA for adult heritage speakers, a small number of children in the study (MC01, SC04, SC18, SC19, MC21, MC22) are best classified as 'over-hearers' of Spanish, in some cases exhibiting only partial lexical knowledge. If heritage language acquisition is supported by positive attitudes in the United Kingdom, then this outcome would be less likely to occur.

One possible explanation is that Guijarro-Fuentes and Marinis' (2011) study was focused on children at a bilingual school in London, a heavily cosmopolitan city with a defined Spanish-speaking community. By contrast, the children in this study mostly lived in Southampton and Winchester, and it is possible that there is a substantial difference in attitudes towards bilingualism in the two contexts. As I have not collected information on the participants' attitudes towards bilingualism, or surveyed this more broadly, this is only a conjecture; some of the patterns of divergence detailed above were visible both in children in the Southampton and London areas in the present study, however, so I think this explanation is unlikely.

An alternative explanation is either that attitudes towards bilingualism do not predict heritage language maintenance, or that attitudes towards bilingualism in the United Kingdom are less positive than claimed by Guijarro-Fuentes and Marinis. Schmid and Karayayla (2019) have found that attitudes towards Turkish are not predictive of its maintenance as a heritage language in the United Kingdom, suggesting that social attitudes towards bilingualism may not be facilitative for heritage language maintenance either, but also implying that heritage speakers' attitudes towards their heritage language are not always positive in the United Kingdom.

7.4.4 The role of the bilingual community in heritage language acquisition and maintenance

Cazzoli-Goeta and Young-Scholten (2011) observed that first generation Spanish speakers who migrated to the United Kingdom showed attrition in the use of 'sentence initial non-nominatives', such as producing 'yo gusto' (lit. 'I please'; intended meaning 'I like') for 'me gusta' (lit. 'it pleases me'; 'I like'). However, they also speculated that since "Spanish speaking communities do not currently exist in the UK", they "predict that attrition at the level of the individual would fail to be transmitted to the next generation" (Cazzoli-Goeta & Young-Scholten, 2011: 223). Domínguez (2013) has also noted that Spanish-speaking migrants to the United Kingdom typically have substantially less contact with other Spanish speakers than migrants to the United States, although sociolinguistic research has identified parts of London in which there are stable Spanish speaking communities of both European and Latin American origin (e.g. Paffey, 2019a: 208-210).

Although not reported in the results, I briefly examined the extent of community contact the children had with Spanish on the basis of the responses to the BiLEC questionnaire. I report this

analysis of differences within the group in Appendix G, but a brief summary of the findings follows. Of the 25 children in the study, 11 have no regular Spanish contact outside the immediate family, even though many of them know each other. Ten children have some contact with Spanish-speaking adults in the community, although this is often restricted to Spanish language tutors (e.g. SC18 and SC19) or a child minder or regular care giver (e.g. MC07 and MC08). Seven children use Spanish with friends in their peer group, for two of whom the amount is small and for five of whom the amount is much larger.

Taken together, this observation provides tacit confirmation of Cazzoli-Goeta and Young-Scholten's (2011) suggestion that the lack of a coherent Spanish-speaking community in the UK means that there is no transmission of Spanish in the wider community. As such, the family is, for almost all of the children, effectively the only place in which the Spanish language is heard and used with frequency. Even within the family, it is typical that the children will only speak Spanish with one or two parents, but rarely among each other, evidence for which is also provided in Appendix G.

Whilst the present study does support Cazzoli-Goeta and Young-Scholten insofar as I observe very little evidence for a Spanish speaking community in the part of England the participants live in, it is nonetheless clear that several of the children have successfully acquired the Preterite-Imperfect distinction. This is contra Cazzoli-Goeta and Young-Scholten's (2011) claim that a heritage language would not be acquired in the absence of a wider speech community. However, it is worth considering some of the broader implications for maintenance and change within heritage and baseline grammars of a wider speech community.

For instance, in many parts of the United States, heritage speakers grow up in a community where Spanish is not only the language of their family, but is used by a substantial number of other individuals in the community. Even if they only use the language in limited contexts at home, multiple sources of input in the community have the potential to function as acquisitional intake. Likewise, a process of dialect levelling among regular Spanish users, with a variety of backgrounds, could affect the shape of the baseline grammar. This is precisely what Domínguez (2013) found for Spanish speakers who migrated to Miami and moved towards the community norms for subject expression there, whereas Spanish speakers who migrated to the United Kingdom and had no Spanish community to adapt to maintained the distribution of subject expression of their monolingually acquired variety.

It is thus plausible that the baseline for acquisition for heritage speakers in a context where there is a substantial speech community may be more likely to diverge from the monolingual variety norms, and consequently to exaggerate the extent to which the heritage speakers themselves

have diverged from the baseline. To illustrate, for the children in the present study, the only source of Spanish input was the family unit and occasional visits to or from the 'homeland' community. For viewpoint aspect at least, the parents' behaviour was similar to what was expected given previous research with the same narrative retelling task and a similar semantic interpretation task, suggesting that the baseline grammar and input is equivalent to a monolingual 'homeland' variety of Spanish. Some of the children showed no evidence of divergence from this grammar in the Preterite-Imperfect contrast in production or comprehension, whereas some children differed from the baseline. Since we know that the input is effectively constant, the only source for this divergence is the acquisition process.

However, in a context like the United States where there is greater community access to Spanish, this would also be a potential source of the divergence in the heritage grammars. In other words, when multiple baseline grammars may be present in the input, it becomes a lot more difficult to establish whether divergence from the baseline in the heritage grammar may in fact represent acquisitional intake coming from an unexpected source, rather than the expected input not becoming acquisitional intake.

7.5 Limitations of the study

In this section, I focus on two limitations of the present study. The first of these relates to the difficulty controlling for the effects of age with the sample size. The second relates to whether the semantic interpretation task was suitable for use with children at the younger end of the age spectrum in the study, and a few limitations arising from the design choices taken to mitigate some potential issues.

7.5.1 Addressing the role of age at time of testing

One of the findings from the present study is the strong association between participants' age and several of the accuracy and usage measures. The decision to include heritage speakers at different ages together, rather than looking at groups at different ages reflects the greater statistical validity of this approach, since age is a continuous variable and dividing participants into groups based on age ranges may obscure what happens across the lifespan (Plonsky & Oswald, 2017).

As such, the original intention was to investigate how age and the other predictor variables together contributed to usage and accuracy rates for each of the morphemes in each of the readings using a logistic regression model. However, due to the smaller than anticipated number

of participants in the study[23], it was difficult to produce a regression model that was meaningfully interpretable.

In what follows, I illustrate the problems associated with interpreting the logistic regression models in Table 35, which provides comparative extracts of different logistic models for accuracy at rejecting the Imperfect in perfective contexts in the semantic interpretation task.

Table 35: Summaries of binomial regression models for accuracy rejecting the Preterite in progressive contexts.

Variables	**Model equation**	**DF**	**Deviance**	**AIC**
None	1.118	68	77.05	79.05
Test age	−0.642 + 0.179*tage	67	74.21	78.21
Richness of exposure	1.089 + 0.192*rich	67	77.04	81.04
Cumulative exposure	0.581 + 0.164*cexp	67	75.41	79.41
Relative exposure	1.052 + 0.267*rexp	67	77.03	81.03
Relative output	1.132 − 0.046*rout	67	77.05	81.05
Spanish speech rate	0.115 + 0.015*spra	67	73.37	77.37
Test age and Richness of exposure	−0.716 + 0.182*tage + 0.366*rich	66	74.17	80.17
Test age and Cumulative exposure	−0.666 + 0.149*tage + 0.101*cexp	66	73.78	79.78
Test age and Relative exposure	−0.874 + 0.185*tage + 0.714*rexp	66	74.11	80.11
Test age and Relative output	−0.593 + 0.185*tage − 0.327*rout	66	74.10	80.10
Test age and Spanish speech rate	−0.519 + 0.092*tage + 0.011*spra	66	72.94	78.94
BEST FIT: Relative output and Spanish speech rate	−0.043 – 2.452*rout + 0.029*spra	66	70.03	76.03

The Spearman's rank correlation coefficient showed a small positive monotonic association between increase age and increased accuracy at rejecting the Preterite in progressive contexts (r_s = 0.302, p = 0.161). As such, it would be reasonable to expect to see a model including age at time of testing to provide a relatively good fit for the data, especially since logistic regression does not map a straight line but a sigmoidal curve between two possible outcomes, in this case a non-accurate rating (0) and an accurate rating (1). The precise interpretation of the models is not

[23] Numerous factors contributed to this, including the Covid pandemic which paused data collection for several months. During this suspension, several families, including one with five children, disappeared from contact.

relevant here, but in essence, a model has a better fit when the deviance between predicted data and observed data is minimised (lower deviance), and accounting for complexity for models of similar deviance (relatively lower AIC). As an example, the model with no variables included and the model including just relative output have the same deviance value (77.05), but since the model with relative output included is more complex without being more explanatorily useful, the simpler model is preferable.

Looking at the models where each variable is entered in turn, I observe that age at time of testing does indeed have lower deviance than the null model, but the model in which Spanish speech rate alone is entered has a lower deviance still. In the Spearman's rank correlations, the association between Spanish speech rate and rejection of the Preterite was negligible ($r_s = 0.015$, $p = 0.944$). The greater explanatory power of Spanish speech rate in the model is thus unexpected given the lack of an association between the two variables. When we further compare models of age at time of testing and each of the other variables, we see that all of them slightly improve the deviance, but the added complexity does not necessarily make them better fits of the data.

Having compared all of the possible models with these individual variables, the best fit for the data is for the model which includes both Spanish speech rate and relative output. This is also curious, as the rank correlation coefficient for relative output also suggested that there was a negligible association between it and rejection of the Preterite in progressive contexts ($r_s = -0.079$, $p = 0.721$). The model only reduces a small amount of deviance, however, and it is thus not clear that it provides a genuinely better fit for the data. It is also curious that the effect of age, which I expected to see reflected in the model due to its rank correlation coefficient, is negligible in the model. As such, the constrained size of the dataset of the present study limits the usefulness of a regression model for interpreting what is happening in the data. This could in part stem from the way that rank correlations effectively discount ties, so if the older heritage speakers are consistently better than the youngest ones whilst still being varied, there is a strong monotonic association, but it is not necessarily relevant to understanding the variation after the initial point. Even though age at time of testing was the most consistently associated variable, it has still been possible to interpret the comparative effect of other variables for predicting the accuracy and usage rates whilst acknowledging the potential confounding role of age, as I have done in previous sections. In the remainder of this section, I provide some further comments on how we can interpret the various associations with age observed in Section 6.4.1.

Since the perfective is a context for which we expect little difficulty, the clear association with age is perhaps to be expected; the children may take a little longer to establish the Preterite-perfective form-meaning association than their monolingual peers, but they do get there. This is

in line with the protracted acquisition observed by Cuza and Miller (2015) for the Imperfect, although it is unclear why I find this association for the Preterite as well when Cuza and Miller only observed it for the Imperfect. This difference may be related to the association of the Present Perfect with perfective meaning, which was also associated with age in the relevant geographically delimited group. The other context for which we expect little difficulty, but for which the form-meaning association may take longer to be successfully acquired under an assumption of protracted acquisition is the progressive. Recall that none of the children used an inappropriate verb form in progressive contexts; as such, I only consider their semantic interpretation ratings here. In these cases, the correlations show a moderate positive association with increased age and increased acceptance of the Imperfect, and a small positive association for rejection of the Preterite. As such, with respect to these two contexts, observing an age effect is not unexpected.

However, Feature Reassembly would predict greater difficulty associating the Imperfect with habitual and continuous meaning, and as such I would expect to see less of an association between test age and these contexts. In the case of continuous contexts, none of the correlations meet the threshold for a 'small' association established by Plonsky and Oswald (2014). In the case of habitual meaning, however, there is a small association with increased use and acceptance of the Imperfect, as well as a moderate association with decreased use of the Present. Recall that the results show that the children tended to use the Imperfect least in habitual contexts. As such, it is possible these meaningful associations between age and usage in habitual contexts reflect the continued operation of the inference engine refining the grammar in line with the baseline, since habitual contexts are the ones where the heritage speakers behaved least like the baseline, and therefore the perceptual intake is presumably higher in these contexts (following Lidz & Gagliardi, 2015).

This association between age and the rate at which certain verb forms were used or not, or the accuracy for rating the different morphemes, in different contexts may reflect a number of other variables that are in turn associated with age. One such variable is increased cognitive functioning. Whilst cognitive abilities increase with age, the L1 acquisition literature shows that children are able to make adult-like judgments of viewpoint aspectual distinctions from not long after age 5 (Hodgson, 2005; García del Real Marco, 2015), and so protracted acquisition of aspectual form-meaning mappings is not likely to be directly related to further increases in cognitive ability. A different explanation is possible from the fact that we know there is a 'bilingual delay' in acquisition (Polinsky & Scontras, 2020), and as such protracted acquisition of form-meaning mappings may simply reflect this delay, yielding the stronger associations with age than would be expected at these ages in L1 acquisition. The same would apply for the rejection of the

inappropriate form in the semantic interpretation task; we know that children do not like to reject inappropriate forms (Ambridge & Rowland, 2013), and given that context it is therefore not surprising that increased age results in increased accuracy in rejecting the inappropriate morpheme in several of the contexts.

Overall, whilst this cross-sectional approach in theory works well for assessing the role of age at time of testing in conjunction with other variables, in this case the ability to do so was constrained by the smaller amount of data. In practice, the questions I have attempted to answer regarding the development of a heritage language during the years which have received least attention in the literature may be best approached using longitudinal methods (Montrul, 2018), especially in contexts where the availability of heritage speakers is more highly constrained. The need for more longitudinal research has been highlighted several times in the heritage language acquisition literature as necessary to adequately disentangle how various processes operate and different outcomes obtain (e.g. Montrul, 2002; Rothman, 2009; Putnam & Sánchez, 2013). The implications from the cross-sectional analysis of the present study provides an initial point of departure in which it seems more plausible that certain types of divergence are the result of restructuring, such as the use of the Present in habitual and continuous contexts, or non-stabilization, such as the use of the Imperfect in perfective contexts. However, the implied plausibility of the two pathways can only be clearly confirmed with longitudinal research.

7.5.2 Deploying the semantic interpretation task

In the present study, I adopted a methodology designed to collect acceptability judgments from older L2 learners from around age 14, which included an invitation to reject forms the participants considered to be inappropriate (Domínguez *et al.*, 2013; Mitchell *et al.*, 2008). Acquisition research with younger children typically deploys more concrete methodologies to maintain their interest and to ensure that there is an immediate relevance of the looked for distinctions in the grammar. Furthermore, research suggests that young children do not like to reject inappropriate forms (Ambridge & Rowland, 2013).

As such, there are a number of potential issues associated with using this task design in the context of the present study, and this is confirmed by the generally meaningful correlations observed between age and accuracy in the semantic interpretation task. To recapitulate, there was a small positive association between increased age and appropriate rejection of the Imperfect in perfective contexts ($r_s = 0.381$), appropriate rejection of the Preterite in progressive contexts ($r_s = 0.302$) and imperfective contexts overall ($r_s = 0.396$), and a moderate positive association between increased age and appropriate acceptance of the Imperfect in progressive

contexts (r_s = 0.492). As such, it is clear that there is a substantial effect of age here, which could reflect the issues highlighted above. These relationships are illustrated in Figure 23.

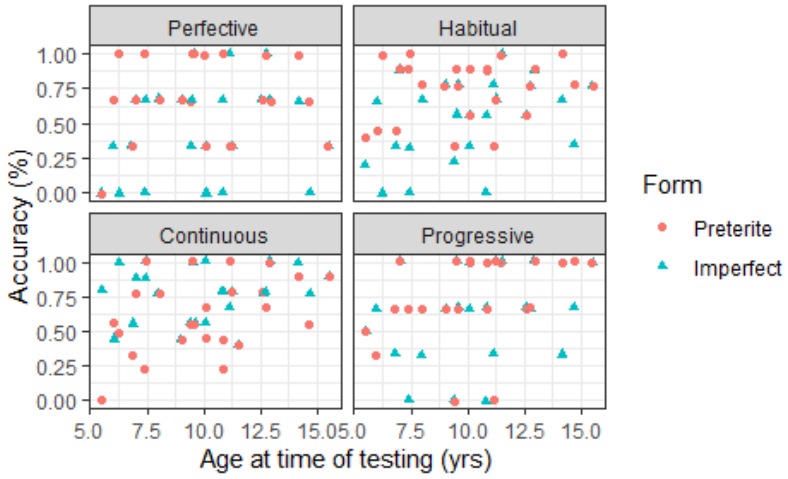


Figure 23: The relationship between age at time of testing and the heritage speakers' accuracy on the semantic interpretation task.

It is clear that the youngest children in the cohort were indeed reluctant to reject the inappropriate verb form, but it is also worth highlighting that at the same time they often had lower accuracy accepting the appropriate form as well. As such, it may be better to interpret their non-rejection of the inappropriate form as not a reluctance to reject but instead reflecting an unexpected grammaticalisation of the verb forms that they would then retreat from.

In view of the broader issues with using similar judgment tasks with young children, it is worth rehearsing whey the chosen methodology was considered most appropriate for the purposes of the study. Alternative design choices, such as the clown video tasks, would have made it impossible to investigate the habitual reading, and it would also have been difficult to establish the continuous reading without including a dynamic event that would distract attention from the focus or cause the children to conceive of the use of the Imperfect as an infelicitous progressive reading. Only the specific type of semantic interpretation task used in the study enabled testing of the full range of meanings under investigation, which was especially important since the perfective and progressive readings were hypothesised to be the least vulnerable in the heritage speakers' grammars. Efforts were made to simplify the cognitive demands of the task to make it as accessible to the younger children as possible, but clearly it was still too complex for them.

Whilst the use of this task with younger children is probably under-informative with respect to their linguistic knowledge of the distinction under investigation, it nonetheless allows us to document a clear progression of linguistic knowledge generally for the heritage speakers. They become more confident about their knowledge - and indeed more accurate - as they get older in

pretty much each of the readings investigated. This progression suggests that we may be seeing a general pattern of slightly protracted acquisition of the comprehension of Spanish viewpoint aspect morphology, with individual differences arising at older ages.

It would have been possible to follow up the semantic interpretation task with questions asking participants why they accepted or rejected the sentences, as this could have given information both about whether the participants were reacting to the target morphology or something else about the sentence. I elected not to ask these questions to reduce the task complexity for the young children, but means that, especially with relation to some of the unexpected parental ratings, it is difficult to ascertain whether other factors such as lexical choices, overly English-sounding stimuli, or some word order variants may have affected choices. In the absence of this data, it is impossible to say whether any of these confounding factors may have had a role.

7.6 Summary and conclusion

In this thesis, I have examined the suitability of the "Revised Feature Reassembly" model proposed by Putnam and Sánchez (2013) as an explanation for how heritage grammars diverge from the baseline through subsequent stages of the language acquisition process. In order to do this, I deployed a narrative retelling task and a semantic interpretation task to investigate the specific case of the acquisition of form-meaning mappings of viewpoint aspect by Spanish heritage speakers in the United Kingdom. Putnam and Sánchez (2013) argue that there will be progressively greater reassembly towards or transfer of features from the majority language in the heritage grammar as the heritage grammar becomes increasingly less activated in comparison to the majority language grammar in the heritage speakers' mind, and explicitly reject the notion that divergence in heritage speakers' grammars can best be explained as a consequence of reduced input alone (cf. Montrul, 2002; Silva-Corvalán, 2003).

Generally speaking, the accuracy and usage rates of the heritage speakers in the present study showed that the predictions of the Feature Reassembly Hypothesis (Lardiere, 2009) as to which specific feature bundles of viewpoint aspect meaning will prove to be most vulnerable from cross-linguistic influence from English in the Spanish heritage grammars are borne out. In line with previous research with L2 learners (e.g. Domínguez, Arche & Myles, 2011, 2017; Domínguez *et al*., 2013) on the basis of a theoretical account of viewpoint aspect that deconstructs the notion of imperfectivity (Arche, 2006, 2014), the habitual and continuous readings of the Imperfect were predicted to be more vulnerable than the association between the Imperfect and progressive meaning or the Preterite and perfective meaning.

These predictions were confirmed in the data. The children's production rates of the Imperfect in habitual and continuous contexts was substantially lower than their use of imperfective verb forms in progressive contexts and perfective verb forms in perfective contexts. In progressive contexts, children also used the Past Progressive verb form, while several children uncanonically associated the Present Perfect with perfective meaning. Whilst the Present Perfect is a permissible perfective marker in some contexts in some of the baseline grammars, only the Preterite would be appropriate with the more temporally historic contexts of the narrative retelling task, and none of the baseline parents used the Present Perfect in the narrative retelling task. Unlike the L2 learners of previous studies, the heritage speakers showed higher rates of use of non-target verb forms in habitual contexts than continuous contexts, one reason for which could be related to lexical aspect, since the continuous is mostly associated with stative verbs, for which heritage speakers are known to be more likely to maintain the Imperfect form than the Preterite (Silva-Corvalán, 2003). In the comprehension task, the results were more similar across the four readings, although the children were slightly less accurate at rejecting the Preterite in continuous contexts, suggesting that the heritage speakers' linguistic knowledge of the Preterite-Imperfect distinction may typically be more robust than their linguistic performance in online production.

Taken together, these data further support Putnam and Sánchez's (2013) model of heritage language acquisition in the ways in which it builds upon the theoretical foundations of the contrastive analysis that underpins the Feature Reassembly Hypothesis (Lardiere, 2009) on which it is built. Specifically, measures of language activation, relative output in Spanish and Spanish speech rate, were more informative than measures of input quantity, cumulative exposure to Spanish and relative exposure to Spanish, for understanding variation among the heritage speakers, especially in the habitual and continuous contexts, the ones predicted to be most vulnerable for heritage speakers. The patterns of divergence that manifested in the use of the Present in habitual and continuous contexts was also clearly related to a process of restructuring or reassembly in the heritage grammar.

However, other aspects of the differences between the heritage speakers and the baseline speakers, such as the use of the Present Perfect as a perfective marker, are not clearly the result of a process of restructuring following successful activation of the appropriate form-meaning mappings in the heritage grammar during the initial stages of acquisition. Whether children used the Present Perfect was strongly correlated with language activation measures, consistent with Putnam and Sánchez's (2013) model, but whether the relevant distinction between recent and historic perfectivity was readily perceived and thus be acquired could be associated with the distributional properties of the input, as would be predicted under recent generative models of L1

acquisition (i.e. Lidz & Gagliardi, 2015). As such, it is appropriate to characterise this difference between the heritage and baseline speakers as reflecting divergence during the initial process of feature assembly. This is contra Putnam and Sánchez's (2013) explicit assumption that feature activation, which I take to be equivalent to the processes of feature selection and feature assembly, will have taken place before heritage speakers subsequently diverge from the baseline. In view of this discrepancy between the stated assumption of the model, and the way that it accurately predicts divergence or convergence at earlier stages of the acquisition process, I have argued that Putnam and Sánchez's (2013) model can be appropriately extended to the initial stages of the acquisition process.

In conclusion, this thesis advances our understanding of how linguistic development obtains under feature-based approaches to heritage language acquisition. The fact that viewpoint aspect was seen to be vulnerable for several of the heritage speakers in this study confirms the vulnerability of this grammatical property, whilst the adoption of Arche's (2014) framework in the present study complements previous studies by showing that this vulnerability is concentrated in the habitual and continuous readings of the Imperfect, which have received little attention in the literature. These findings are in line with the Feature Reassembly Hypothesis (Lardiere, 2009), and provide substantial support Putnam and Sánchez's (2013) model of Revised Feature Reassembly, with measures of language activation correlating strongly with the heritage speakers' divergence from the baseline speakers. Where the results differ from the assumptions of the Revised Feature Reassembly model, there is evidence that the model extends to the initial stages of language acquisition, expanding the sources of divergence in heritage grammars from just feature reassembly to also include feature selection and feature assembly as well.

Appendix A Proof of ethical approval

James Corbet

From: ERGOII
Sent: 06 February 2019 11:19
To: Corbet J.
Subject: Approved by Faculty Ethics Committee - ERGO II 46537

UNIVERSITY OF Southampton

ERGO II – Ethics and Research Governance Online https://www.ergo2.soton.ac.uk

Submission ID: 46537
Submission Title: Spanish-English bilingual children's comprehension and production of verbal morphology
Submitter Name: James Corbet

Your submission has now been approved by the Faculty Ethics Committee. You can begin your research unless you are still awaiting any other reviews or conditions of your approval.

Comments:

-
-
- Thank you for making the requested changes. I'm happy to approve.

Click here to view the submission

Tid: 23011_Email_to_submitter___Approval_from_Faculty_Ethics_committee__cat_B___C_ Id: 109836

James.Corbet@soton.ac.uk coordinator

James Corbet

From: ERGOII
Sent: 17 August 2020 14:49
To: Corbet J.
Subject: Approved by Faculty Ethics Committee - ERGO II 46537.A2

University of Southampton

ERGO II – Ethics and Research Governance Online https://www.ergo2.soton.ac.uk

Submission ID: 46537.A2
Submission Title: Spanish-English bilingual children's comprehension and production of verbal morphology (Amendment 2 COVID-19))
Submitter Name: James Corbet

Your submission has now been approved by the Faculty Ethics Committee. You can begin your research unless you are still awaiting any other reviews or conditions of your approval.

Comments:

- Happy to approve. Good luck with the research.
- I am happy to approve this project as I think all revision requests have been answered.

  However, it occurred to me that for record keeping purposes, there should be a record on ERGO of the PIS / consent form rather than just a link. I thus downloaded the PIS/consent form and have attached it here.

Please note documents have been attached to this approval that require your review.

Appendix B The *Cat Story* narrative retelling task

La historia
de Natalia

y su gato
Pancho

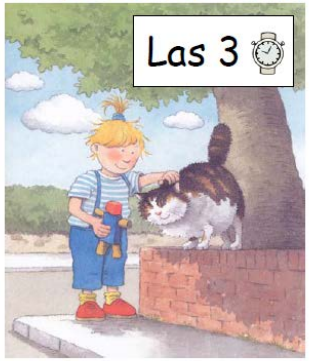
Hola, soy Natalia.

De niña, todas las mañanas
eran iguales…

Natalia

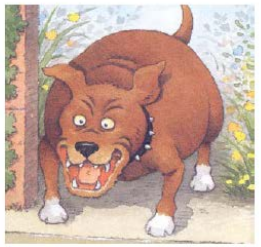
Y Pancho

Al final del día...

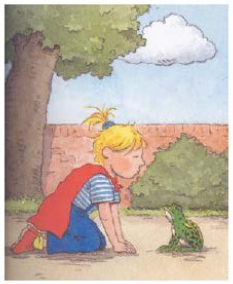


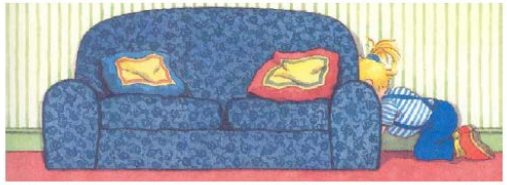
Hasta que un día...

Pancho...



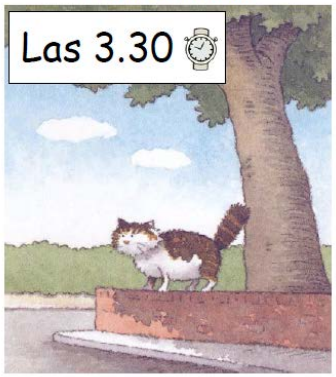
Y Natalia...

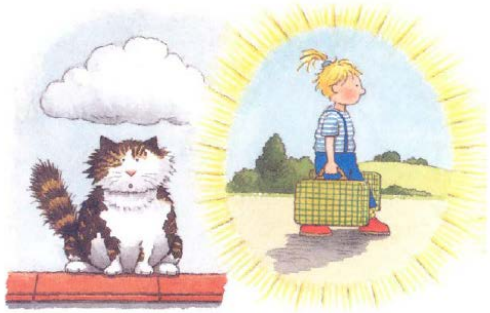


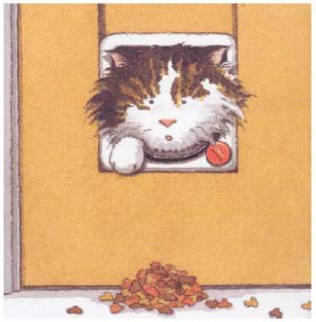


Natalia...

Pancho…







¡Fin!

La historia que usamos en este librillo se adaptó del cuento "Missing" por Jonathan Langley, © Frances Lincoln 2000, ISBN 9780711215436.

Appendix C Full set of stimuli used in the semantic interpretation task

Verb form	Type	Context	Image	Summaries
Preterite	Perfective	Anita es una abeja a quién le encanta cocinar todo tipo de comida. Quería cocinar algo delicioso para la fiesta de Raquel. Sabía que a ella le gustan las galletas. *Anita is a bee who loves cooking every type of food. She wanted to cook something nice for Rachel's party. She knew that she likes cookies.*		Anita la Abeja <u>hizo</u> galletas para la fiesta #Anita la Abeja hacía galletas para la fiesta *Anita the bee <u>make-PRET</u> / #make-IMP cookies for the party [activity]*
Preterite	Perfective	Anoche, Anita la Abeja se despertó cuando pasaron tres trenes por su casa. Esto nunca había pasado antes. *Last night, Anita the Bee woke up when three trains passed by her house. This had never happened before.*		Anita la Abeja <u>oyó</u> los trenes de madrugada #Anita la Abeja oía los trenes de madrugada *Anita the bee <u>hear-PRET</u> / #hear-IMP the trains through the night [state]*

Verb form	Type	Context	Image	Summaries
Preterite	Perfective	Vi a Eduardo el Elefante hoy por la mañana. Hablamos un rato. Al principio, tenía una botella llena de agua, pero al despedirnos no quedaba ninguna gota. *I saw Edward the Elephant this morning. We spoke for a while. At first, he had a bottle full of water, but when we said goodbye not a single drop was left.*		Eduardo el Elefante bebió una botella de agua #Eduardo el Elefante bebía una botella de agua *Eduardo the Elephant drink-PRET / #drink-IMP a bottle of water [accomplishment]*

Verb form	Type	Context	Image	Summaries
Preterite	Perfective	Ayer fue el cumpleaños de Raquel la Ratona. Gabriel el Gato es muy amable con sus amigos, y por eso le llevó un regalo súper lindo. *Yesterday was Rachel the Mouse's birthday. Gabriel the Cat is very kind to his friends, and so he bought her a very nice present.*		Gabriel el Gato llegó a la fiesta con el regalo #Gabriel el Gato llegaba a la fiesta con el regalo *Gabriel the Cat arrive-PRET / #arrive-IMP at the party with the present [achievement]*
Preterite	Perfective	El año pasado, Gabriel el gato no pudo venir a mi fiesta de cumpleaños porque tenía que hacer el trabajo escolar con la ayuda de la profesora. *Last year, Gabriel the Cat could not come to my birthday party because he had to do school work with the teacher's help.*		Gabriel el Gato no vino porque necesitó ayuda con los deberes #Gabriel el Gato no vino porque necesitaba ayuda con los deberes *Gabriel the Cat NEG come-PRET because PRO need-PRET / #need-IMP help with his homework [state]*

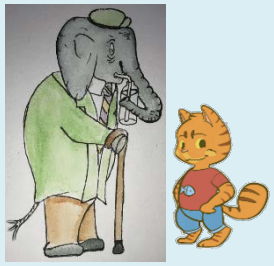
Verb form	Type	Context	Image	Summaries
Preterite	Perfective	El sábado pasado, los nietos de Olivia la Oveja la visitaron. Pasaron un día lleno de actividades, y al final los niños se sentaron para escucharle contar su cuento favorito. *Last Saturday, Olivia the Ewe's grandchildren visited her. They spent the day doing lots of activities, and at the end the children sat down to hear her tell her favourite story.*		Olivia la Oveja les <u>leyó</u> un libro a los niños #Olivia la Oveja les leía un libro a los niños *Olivia the Ewe them <u>read-PRET</u> / #read-IMP a book to the children [accomplishment]*
Preterite	Perfective	A Carlos el Cerdo siempre le gusta estar a la moda. Por eso, decidió pintar la pared de su cuarto del color más de moda en este momento: azul. ¡Ahora se ve perfecto! *Carlos the Pig always likes to be fashionable. Because of this, he decided to paint the wall of his room in the most fashionable colour right now: blue. Now it looks perfect!*		Carlos el Cerdo <u>pintó</u> la pared de azul #Carlos el Cerdo pintaba la pared de azul *Carlos the Pig <u>paint-PRET</u> / #paint-IMP the wall DE blue [accomplishment]*

Verb form	Type	Context	Image	Summaries
Preterite	Perfective	Raquel la Ratona no había pensado en comer antes de ir a la fiesta de su cumpleaños. Vio las galletas recién hechas y decidió tomar la más grande para satisfacer su hambre. Y luego, tomó otra, y otra, y otra… *Raquel the Mouse had not thought to eat before going to her birthday party. She saw the freshly baked cookies and decided to eat the largest one to satisfy her hunger. And another, and another…*		Raquel la Ratona se comió las galletas #Raquel la Ratona se comía las galletas *Raquel the Mouse SE eat-PRET / #eat-IMP the cookies [accomplishment]*
Preterite	Perfective	Raquel la Ratona está en Escocia. Al llegar anoche, notó el frío que hace allí ahora mismo, pero ya se acostumbró al clima. *Raquel the Mouse is in Scotland. When she arrived last night, she realised how cold it is there right now, but she's already got accustomed to the climate.*		Raquel la Ratona tuvo frío (al llegar) anoche #Raquel la Ratona tenía frío (al llegar) anoche *Raquel the Mouse have-PRET / #have-IMP cold last night [state]*

Verb form	Type	Context	Image	Summaries
Imperfect	Habitual	Por su tamaño, Eduardo el Elefante necesita tomar mucha agua. Cuando era joven, tenía que tomar una botella entera cada hora para mantener su crecimiento. *Because of his size, Eduardo the Elephant needs to have a lot of water. When he was young, he had to have a bottle every hour to keep on growing.*		#Eduardo el Elefante bebió mucha agua Eduardo el Elefante bebía mucha agua *Eduardo the Elephant #drink-PRET / drink-IMP a lot of water [accomplishment]*
Imperfect	Habitual	Hace varios años, Olivia la Oveja fue profesora. Le gustaba pasar la última hora de cada día contando historias a los niños para que apreciaran la magia de leer. *Many years ago, Olivia the Ewe was a teacher. She liked to spend the last hour of every day telling stories to the children so that they would learn the magic of reading.*		#Olivia la Oveja les leyó a los niños Olivia la Oveja les leía a los niños *Olivia the Ewe them #read-PRET / read-IMP to the children [activity]*

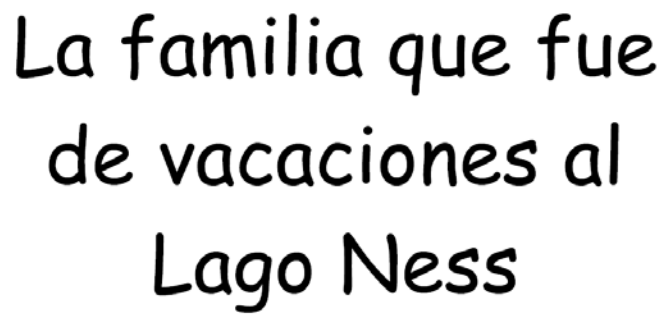
Verb form	Type	Context	Image	Summaries
Imperfect	Habitual	A Carlos el Cerdo siempre le gusta estar a la moda, por eso pasa mucho tiempo pintando la pared de su cuarto cada primavera. Ahora está pintada de verde, pero durante varios años fue azul. *Carlos the Pig always likes to be fashionable, and so he spends a lot of time painting his room every spring. Right now it's painted green, but for many years it was blue.*		#Cada primavera, Carlos el Cerdo pinto la pared de azul Cada primavera, Carlos el Cerdo pintaba la pared de azul *Every spring, Carlos the pig #paint-PRET / paint-IMP the wall DE blue [accomplishment]*
Imperfect	Continuous	Anita la Abeja sabe que para hacer galletas, hay que calentar el horno. *Anita the Bee knows that to make cookies, you have to heat the oven.*		#Mientras Anita la Abeja hacía galletas, el horno estuvo caliente Mientras Anita la Abeja hacía galletas, el horno estaba caliente *Whilst Anita the bee make-IMP cookies, the oven #be-PRET / be-IMP hot [state]*
Imperfect	Continuous	Cuando Gabriel el Gato llegó a la fiesta de Raquel la Ratona, notó las decoraciones maravillosas. *When Gabriel the Cat arrived at Raquel the Mouse's party, he noticed the marvellous decorations.*		#El cartel adornó la pared cuando Gabriel llegó El cartel adornaba la pared cuando Gabriel llegó *The banner #hang-PRET / hang-IMP on the wall when Gabriel arrive-PRET [state]*

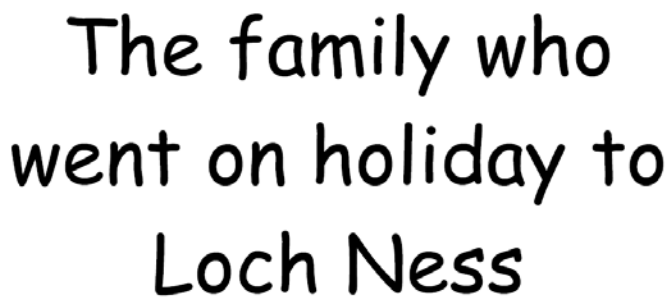
Verb form	Type	Context	Image	Summaries
Imperfect	Continuous	Raquel la Ratona vivió en Escocia hace mucho tiempo. No podía aguantar el frío que hacía todo el tiempo. Por eso, decidió mudarse a España. *Raquel the Mouse lived in Scotland a long time ago. She could not stand how cold it was all the time, so she decided to move to Spain.*		#Raquel la Ratona tuvo frío cuando vivía en Escocia Raquel la Ratona tenía frío cuando vivía en Escocia *Raquel the Mouse #have-PRET / have-IMP cold when PRO live-IMP in Scotland [state]*
Imperfect	Progressive	Un día, Anita la Abeja esperaba una llamada importante. Quería distraerse mientras esperaba, así que se puso a hacer galletas. *One day, Anita the Bee was waiting for an important call. She wanted to distract herself while she waited, so she decided to make some cookies.*		#Mientras Anita la Abeja hizo galletas, sonó el teléfono Mientras Anita la Abeja hacía galletas, sonó el teléfono *While Anita the Bee #make-PRET / make-IMP cookies, ring-PRET the telephone [activity]*
Imperfect	Progressive	Raquel la Ratona estaba sentada, comiendo galletas, cuando vio a Gabriel el Gato llegando a la fiesta. *Raquel the Mouse was sitting, eating cookies, when she saw Gabriel the Cat arriving to the party.*		#Mientras Raquel la Ratona comió galletas, llegó Gabriel Mientras Raquel la Ratona comía galletas, llegó Gabriel *While Raquel the Mouse #eat-PRET / eat-IMP cookies, arrive-PRET Gabriel [activity]*

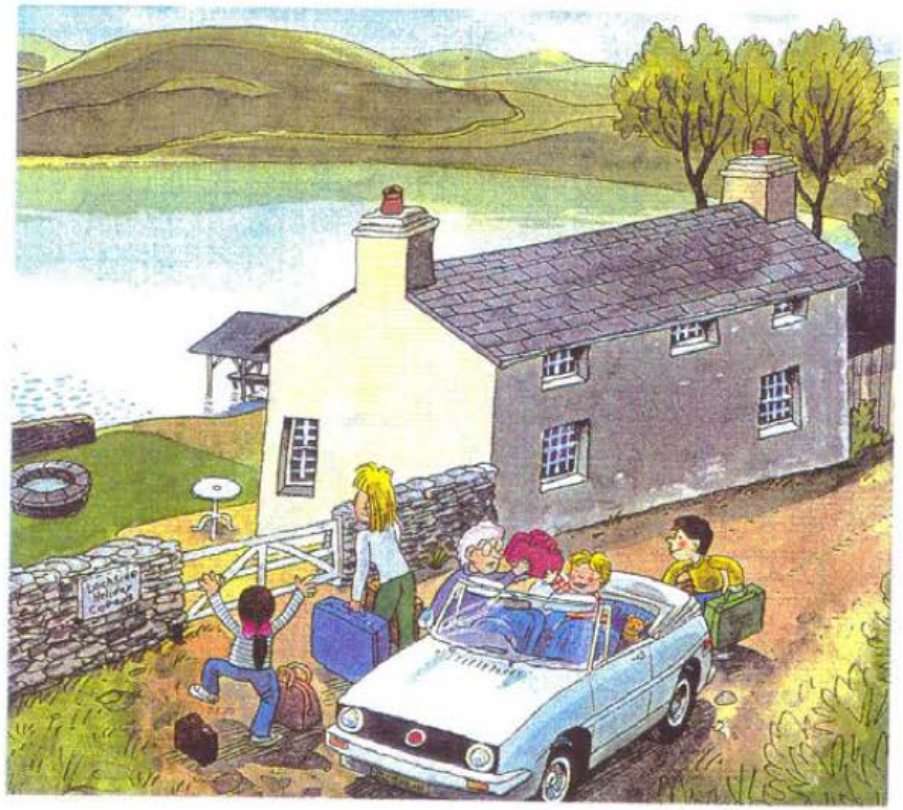
Verb form	Type	Context	Image	Summaries
Imperfect	Progressive	Eduardo el Elefante estaba de pie, tomando agua en el parque. De repente, Gabriel el Gato le saludó. *Eduardo the Elephant was standing, drinking water in the park. All of a sudden, Gabriel the Cat greeted him.*		#Mientras Eduardo el Elefante bebió la botella, vio a Gabriel el Gato Mientras Eduardo el Elefante <u>bebía</u> la botella, vio a Gabriel el Gato *While Eduardo the Elephant #drink-PRET / <u>drink-IMP</u> the bottle, PRO see-PRET DOM Gabriel the Cat [accomplishment]*

Appendix D The *Loch Ness* narrative retelling task

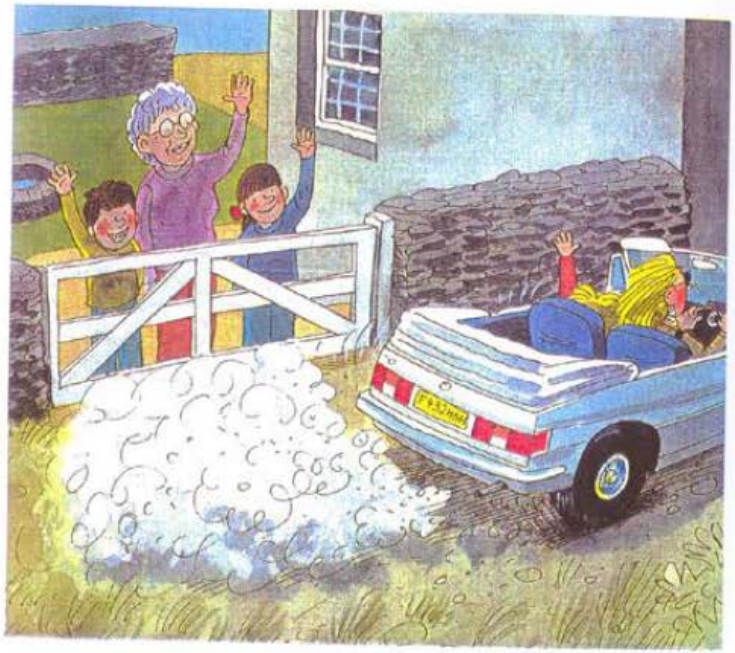
The only difference between the Spanish and English versions of the task was the title on the front cover:

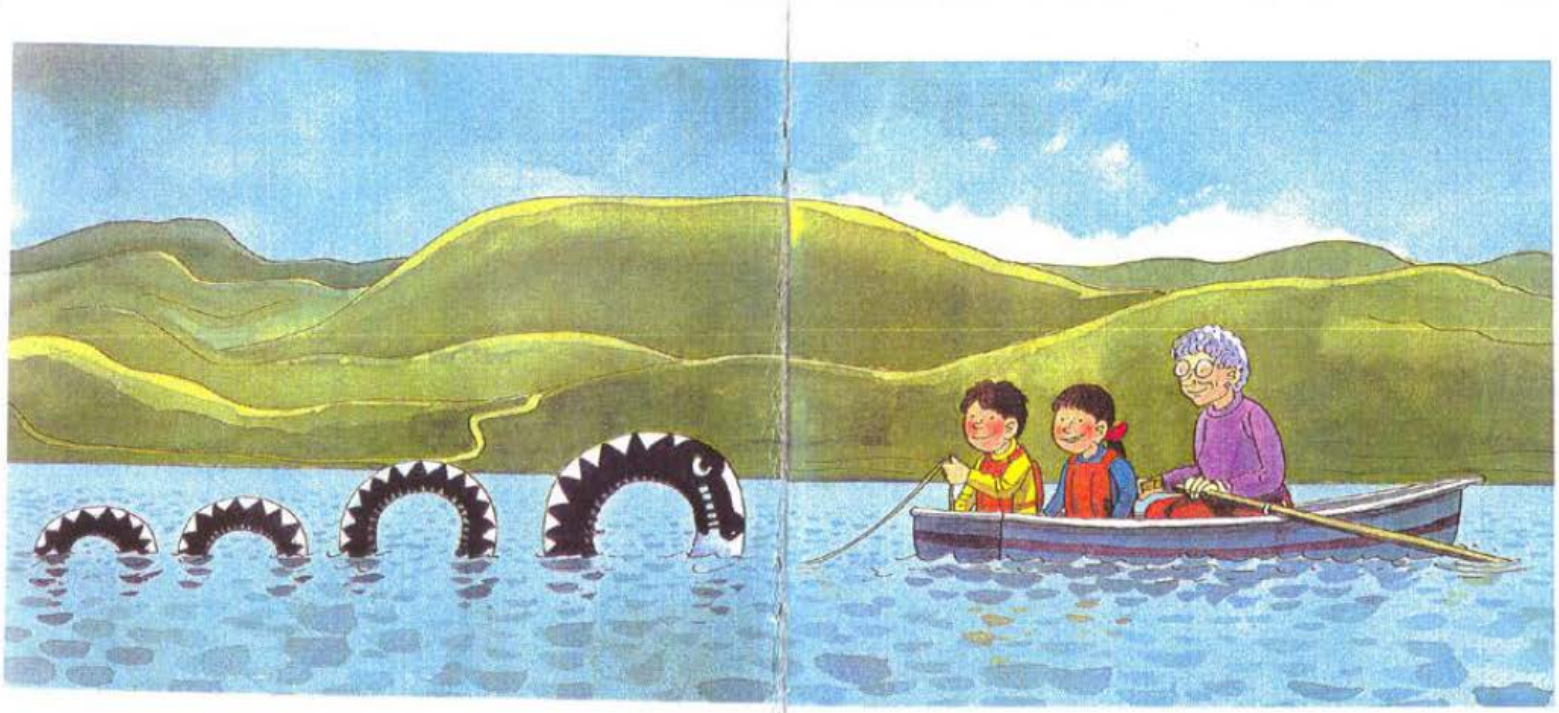




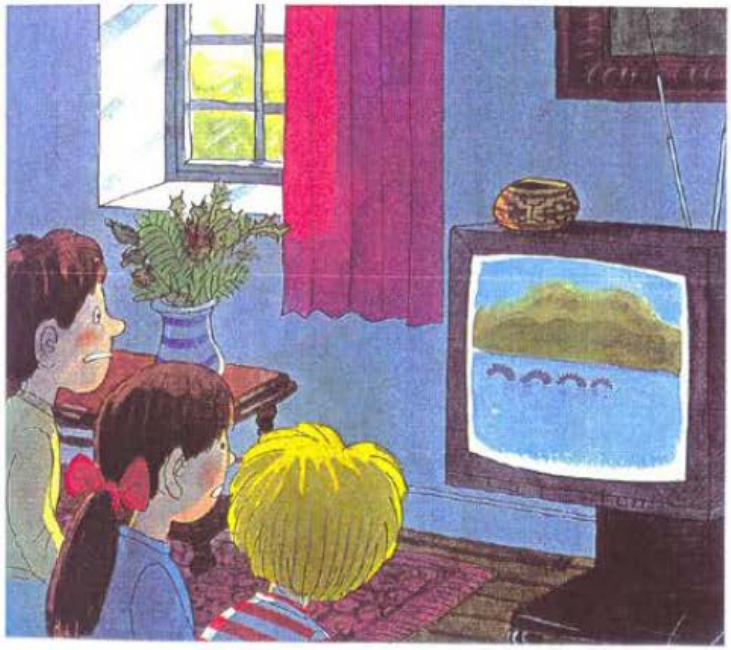


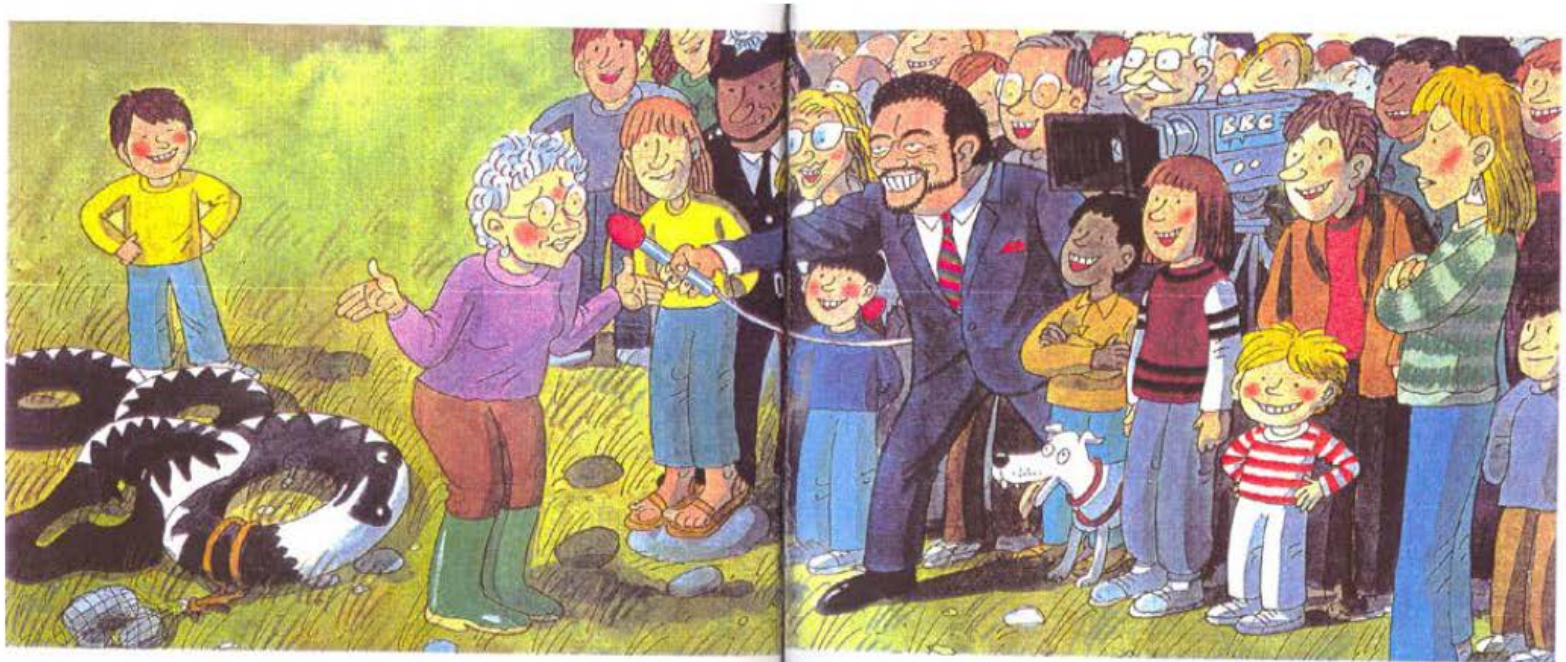

Chip

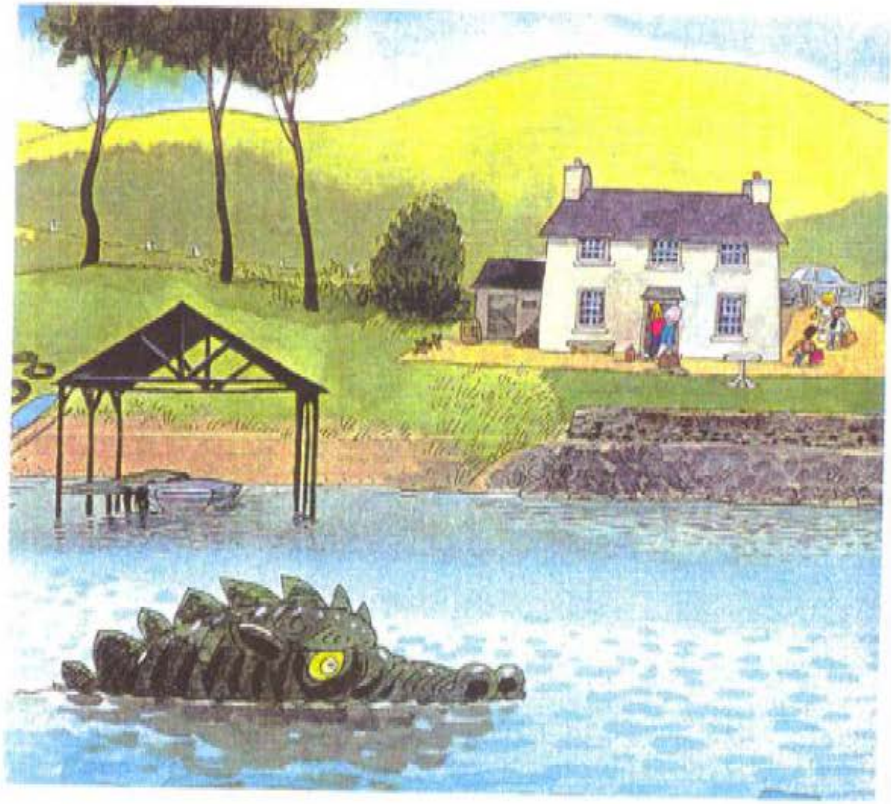





INTOURIST




BBC



Appendix E Bilingual Language Experience Calculator

Sharon Unsworth has made the Bilingual Language Experience Calculator (BiLEC) resources available on the IRIS repository for second language research instruments, available at: https://www.iris-database.org/iris/app/home/detail?id=york%3a928327. The following questionnaire allowed parents to provide answers that I subsequently transferred into the original BiLEC spreadsheet.

Your child's Spanish and English details

Today's date: __ __ / __ __ / __ __ __ __

What is your name? _____

What is your relation to the child? _____

What is their name? _____

What is their date of birth? __ __ / __ __ / __ __ __ __

Where were they born? _____

If outside the UK, when did they arrive here? __ __ / __ __ / __ __ __ __

Does your child have any brothers or sisters? _____

If so, please provide their names and ages here:

1. _____
2. _____
3. _____
4. _____

What is your current occupation? _____

What is your highest level of education? _____

What is the other parent's current occupation? _____

What is their highest level of education? _____

Thank you for providing this general background information.

In the following sections, you will be asked to provide information about:

1. The amount of Spanish and English your child hears and uses in day to day life
2. Who your child uses Spanish and English with
3. Where your child uses Spanish and English
4. The amount of Spanish and English your child has previously heard

If your child did not start hearing both Spanish and English from birth, please indicate which language came later, and at which age/date: _____

How well does your child speak Spanish and English?

	Virtually cannot speak	Limited speaking ability	Some speaking ability	Good speaking ability	Excellent speaking ability	Native-like speaking ability
Spanish						
English						

How well does your child understand Spanish and English?

	Virtually cannot understand	Limited ability to understand	Some ability to understand	Good ability to understand	Excellent ability to understand	Native-like ability to understand
Spanish						
English						

How many errors does your child make when speaking Spanish and English?

This is not about what their accent sounds like, but instead errors such as using the wrong words or putting a sentence together incorrectly. (You can also note if others in the household make errors with either language too)

	Very many errors	Regular errors	Few errors	Virtually no errors
Spanish				
English				

Does your child have regular contact with any other languages? _____

If so, please indicate which language(s), and give as much information as you can for the questions asked above about Spanish and English:

_____

In the tables below, you will be asked to think about everybody who uses Spanish and English with your child at home. If you need more space (for people or languages), please ask. Use the information in this table to help you understand what to put in each box:

Age started	*Enter the appropriate age. If birth, put 0. If specifying months, use y and m to distinguish - example 12 years 6 months = 12y 6m.*
Speaking level	*Use the initial letter of the scale provided for the child's own level on page 2 - V, L, S, G, E, N.*
Understanding level	
Amount used	*Give an estimated percentage of the amount this language is used with the child of all time spent speaking with them - example 60%.*

In this table, please indicate which of the following people speak Spanish with your child regularly at home:

	Parents/guardians		Brothers/sisters				Other adults		
	You	Other	1	2	3	4	1	2	3
Age at which this person started using Spanish									
Spanish speaking level									
Spanish understanding level									
Amount of Spanish used with child									

In this table, please indicate which of the following people speak English with your child regularly at home:

	Parents/guardians		Brothers/sisters				Other adults		
	You	Other	1	2	3	4	1	2	3
Age at which this person started using English									
English speaking level									
English understanding level									
Amount of English used with child									

In the table below, you will be asked to think about everybody your child uses Spanish and English with at home. If you need more space (for people or languages), please ask. Use the information in this table to help you understand what to put in each box:

Amount of language child uses	*Give an estimated percentage of the amount this language is used with the child of all time spent speaking with them - example 60%.*

In this table, please indicate which languages your child uses when speaking with the following people regularly at home:

	Parents/guardians		Brothers/sisters				Other adults		
	You	Other	1	2	3	4	1	2	3
Amount of Spanish child uses									
Amount of English child uses									
Amount child uses other languages									

Does your child currently attend a school? _____

Does your child currently attend any after-school activities/care? _____

If yes to one or both, please complete the relevant part(s) of this table.

If no to both, please leave the table empty and start the next page.

	School				After-school care			
	Teacher(s)		Classmates		Adult(s)		Other children	
	English	Spanish	English	Spanish	English	Spanish	English	Spanish
Language speaking level								
Language understanding level								
Amount (%) language used								

How many weeks a year does your child have as holiday from these? _____

In this table, please indicate where your child typically spends their time on an average week day (Monday - Friday), and which people they are with when at home.

WEEKDAY	AT HOME									AT SCHOOL	AT AFTER SCHOOL CARE
	Parents or guardians		Brothers and sisters				Other adults				
	You	Other	1	2	3	4	1	2	3		
05:00 - 05:30											
05:30 - 06:00											
06:00 - 06:30											
06:30 - 07:00											
07:00 - 07:30											
07:30 - 08:00											
08:00 - 08:30											
08:30 - 09:00											
09:00 - 09:30											
09:30 - 10:00											
10:00 - 10:30											
10:30 - 11:00											
11:00 - 11:30											
11:30 - 12:00											
12:00 - 12:30											
12:30 - 13:00											
13:00 - 13:30											
13:30 - 14:00											
14:00 - 14:30											
14:30 - 15:00											
15:00 - 15:30											
15:30 - 16:00											
16:00 - 16:30											
16:30 - 17:00											
17:00 - 17:30											
17:30 - 18:00											
18:00 - 18:30											
18:30 - 19:00											
19:00 - 19:30											
19:30 - 20:00											
20:00 - 20:30											
20:30 - 21:00											
21:00 - 21:30											
21:30 - 22:00											
22:00 - 22:30											
22:30 - 23:00											

In this table, please indicate where your child typically spends their time on an average weekend day (Saturday and Sunday), and which people they are with when at home.

WEEKEND	AT HOME									AT SCHOOL	AT AFTER SCHOOL CARE
	Parents or guardians		Brothers and sisters				Other adults				
	You	Other	1	2	3	4	1	2	3		
05:00 - 05:30											
05:30 - 06:00											
06:00 - 06:30											
06:30 - 07:00											
07:00 - 07:30											
07:30 - 08:00											
08:00 - 08:30											
08:30 - 09:00											
09:00 - 09:30											
09:30 - 10:00											
10:00 - 10:30											
10:30 - 11:00											
11:00 - 11:30											
11:30 - 12:00											
12:00 - 12:30											
12:30 - 13:00											
13:00 - 13:30											
13:30 - 14:00											
14:00 - 14:30											
14:30 - 15:00											
15:00 - 15:30											
15:30 - 16:00											
16:00 - 16:30											
16:30 - 17:00											
17:00 - 17:30											
17:30 - 18:00											
18:00 - 18:30											
18:30 - 19:00											
19:00 - 19:30											
19:30 - 20:00											
20:00 - 20:30											
20:30 - 21:00											
21:00 - 21:30											
21:30 - 22:00											
22:00 - 22:30											
22:30 - 23:00											

(If you attend a religious service at the weekend, please provide this information in the 'other' column of the table on page 7).

In the following table, please provide information about your child's extra-curricular activities, including the amount of time spent on each activity and the percentage of each language your child uses in each situation:

	Sports and clubs	With friends	Watching TV/films	On Computer	Reading	Other
Hours per week spent on activity						
Amount of Spanish child uses						
Amount of English child uses						
Amount child uses other languages						

Finally, in this table please provide an estimate of the amount of SPANISH that your child regularly heard at home and outside the home in previous years:

	AT HOME									AT SCHOOL OR DAYCARE	AT OTHER ACTIVITIES
	Parents or guardians		Brothers and sisters				Other adults				
	You	Other	1	2	3	4	1	2	3		
0 - 1											
1 - 2											
2 - 3											
3 - 4											
4 - 5											
5 - 6											
6 - 7											
7 - 8											
8 - 9											
9 - 10											
10 - 11											
11 - 12											
12 - 13											
13 - 14											
14 - 15											

THANK YOU FOR PROVIDING ALL OF THIS INFORMATION

Appendix F The parents' individual accuracy and production rates

Table 36: Individual accuracy rates of the forms by each parent in each context type in the semantic interpretation task.

	Perfective		Habitual		Continuous		Progressive	
Participant	**PRET.**	**IMP.**	**PRET.**	**IMP.**	**PRET.**	**IMP.**	**PRET.**	**IMP.**
MP01	**100**	89	67	**67**	67	**100**	67	**67**
CP02	**89**	89	67	**67**	100	**100**	100	**100**
SP03	**100**	100	67	**100**	100	**100**	100	**100**
SP04	**100**	89	100	**100**	67	**100**	67	**100**
MP05	**100**	100	100	**100**	100	**100**	100	**100**
SP06	**78**	89	67	**67**	100	**100**	100	**67**
SP07	**89**	100	67	**100**	67	**100**	100	**100**
SP08	**89**	89	100	**100**	100	**67**	100	**100**
AP09	**100**	100	67	**67**	100	**100**	100	**33**
SP10	**100**	100	100	**67**	67	**100**	100	**100**
AP11	**100**	100	100	**100**	100	**100**	100	**67**
SP12	**100**	100	100	**100**	100	**100**	100	**100**
SP13	**100**	100	-	**-**	-	**-**	100	**100**
MP14	**89**	67	33	**67**	67	**100**	100	**100**
SP15	**100**	100	100	**100**	67	**67**	100	**100**
AP16	**100**	100	100	**100**	100	**100**	100	**100**

Table 37: Individual usage rates of the forms by each parent in each context type in the Cat Story. In each form column, the number is a percentage value.

	Perfective					**Habitual**					**Continuous**					**Progressive**				
Participant	**PRET**	IMP	PRES	OTH	*COUNT*	PRET	**IMP**	PRES	OTH	*COUNT*	PRET	**IMP**	PRES	OTH	*COUNT*	PRET	**IMP**	PRES	OTH	*COUNT*
MC01	**-**	-	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
CP02 @	67	**0**	**33**	**0**	***3***	**0**	100	**0**	**0**	***1***	**-**	-	**-**	**-**	**-**	**-**	-	**-**	**-**	**-**
SP03	**100**	0	0	0	*25*	0	**89**	11	0	*9*	0	**86**	14	0	*7*	0	**100**	0	0	*6*
SP04 @	**100**	0	0	0	*1*	-	**-**	-	-	-	0	**100**	0	0	*3*	-	**-**	-	-	-
MP05	**100**	0	0	0	*21*	0	**100**	0	0	*10*	0	**75**	25	0	*4*	-	**-**	-	-	-
SP06	**92**	8	0	0	*12*	0	**100**	0	0	*10*	0	**100**	0	0	*2*	0	**100**	0	0	*4*
SP07	**96**	4	0	0	*24*	0	**100**	0	0	*17*	0	**100**	0	0	*10*	0	**100**	0	0	*2*
SP08	**96**	4	0	0	*24*	0	**100**	0	0	*15*	0	**100**	0	0	*3*	-	**-**	-	-	-
AP09	**96**	4	0	0	*26*	0	**100**	0	0	*13*	0	**100**	0	0	*19*	0	**100**	0	0	*2*
SP10	**95**	0	5	0	*21*	0	**100**	0	0	*12*	0	**100**	0	0	*3*	0	**100**	0	0	*1*
AP11	**100**	0	0	0	*20*	0	**100**	0	0	*13*	0	**86**	14	0	*7*	0	**100**	0	0	*2*
SP12	**100**	0	0	0	*19*	0	**100**	0	0	*15*	0	**100**	0	0	*4*	0	**100**	0	0	*1*
SP13	**93**	7	0	0	*15*	0	**100**	0	0	*14*	0	**100**	0	0	*2*	0	**100**	0	0	*7*
MP14 @	**100**	0	0	0	*2*	-	**-**	-	-	-	0	**100**	0	0	*2*	-	**-**	-	-	-
SP15	**95**	5	0	0	*22*	0	**100**	0	0	*12*	0	**100**	0	0	*7*	0	**100**	0	0	*1*
AP16	**100**	0	0	0	*22*	0	**100**	0	0	*15*	0	**100**	0	0	*4*	-	**-**	-	-	-

Appendix G Information about the heritage speakers' family and community Spanish use

Table 38: Regular interaction with interlocutors at home (excluding holiday visits either way; for siblings, a small amount is less than 0.25, and a large amount is anything above this) (SC09, AC11, and AC25 are only children)

One parent only	Two parents[1]	No amount with sibling(s)	Small amount with sibling(s)	Large amount with sibling(s)
MC01	CC02 *	MC01	MC07	SC05
SC03	SC05	CC02	MC08	SC06
SC04	SC06	SC03	SC18	SC10
MC07	SC09	SC04	SC19	SC12
MC08	SC10	AC14		SC13
AC14	AC11 *	AC15		SC16
AC15	SC12	MC20		SC17
SC16	SC13	MC21		
SC17	SC18	MC22		
SC23	SC19	SC23		
SC24	MC20	SC24		
AC25	MC21			
	MC22			

[1] Includes parents' partners. * indicates a Spanish L2 parent who uses Spanish with their child.

Table 39: Number of Spanish interlocutors in the home

1	2	3	4	5+
MC01	CC02 *	SC10	SC05	SC12
SC03	MC07	SC18	SC06	SC13
SC04	MC08	SC19		
AC14	SC09 @			
AC15	AC11 * @			
SC23	SC16			
SC24	SC17			
AC25 @	MC20			
	MC21			
	MC22			

* indicates that one of the interlocutors is an L2 speaker of Spanish. @ indicates an only child.

The distribution of children into various groups in these tables demonstrates that the general pattern of Spanish language usage within the home is highly restricted for the children in the study. The split in the number of children who have one or two Spanish-speaking parents is

almost exactly equal. Of the children with siblings (22 of the 25), exactly half never use Spanish with their siblings, four use a small amount of Spanish with at least one sibling (of the two families in this category, the two children in one family use Spanish around 5% of the time with each other [although in both cases the mother reported that they never heard their sibling speak Spanish, but used Spanish themselves when speaking to their sibling], and in the other family each child uses Spanish approximately 5% of the time with a much older brother), and the children in four other families used a large amount of Spanish with each other. Indeed, the number of interlocutors within the home is negatively skewed, with 18 of 25 children only having one or two people who speak Spanish to them in the household.

Table 40: Regular interaction with interlocutors outside the home (a small amount is less than 0.25, and a large amount is anything above this)

No individuals in the community	**Some adults in the community**	**Small amount with friends**	**Large amount with friends**	**Large amount with friends and some adults**
MC01	CC02	SC09	SC05	SC10
SC03	MC07	AC11	SC06	SC16
SC04	MC08			SC17
SC12	SC18			
SC13	SC19			
AC14	SC23			
AC15	SC24			
MC20				
MC21				
MC22				
AC25				

Of the 25 children in the study, 11 have no regular Spanish contact outside the immediate family. Ten children have some contact with Spanish-speaking adults in the community, although this is often restricted to Spanish language tutors (e.g. SC16 and SC17) or a child minder or regular care giver (e.g. MC07 and MC08). Seven children use Spanish with friends in their peer group, for two of whom the amount is small and for five of whom the amount is much larger. One regular comment from parents was that even when they would meet with Spanish-speaking families, the children would almost exclusively speak to each other in English (many of the children actually know each other; certainly, SC03 knows SC13, and the two families of SC18 and SC19, and MC20, MC21 and MC22 know each other, but the children do not speak to each other in Spanish).

List of References

Aalberse, S., and Hulk, A. (eds.) 2018. Heritage language studies and early child bilingualism research: Understanding the connection [special issue]. *International Journal of Bilingualism* 22(5), pp. 491-582. Available online: https://journals.sagepub.com/toc/ijb/22/5

Adger, D. 2003. *Core Syntax: A Minimalist Approach*. Oxford : Oxford University Press.

Adger, D., and P. Svenonius. 2011. Features in Minimalist Syntax. In C. Boeckx (ed.) *The Oxford Handbook of Linguistic Minimalism*. Oxford: Oxford University Press, pp. 27-51. doi: 10.1093/oxfordhb/9780199549368.013.0002

Ambridge, B., and C. Rowland. 2013. Experimental methods in studying child language acquisition. *WIREs Cognitive Science* 4(2), pp. 149-168. doi: 10.1002/wcs.1215

Andersen, R.W., and Y. Shirai. 1996. The primacy of aspect in first and second language acquisition: The pidgin-creole connection. In W.C. Ritchie and T.K. Bhatia (eds.) *Handbook of Second Language Acquisition*. San Diego: Academic Press, pp. 527-570.

Amderson, R.T. 2001. Lexical morphology and verb use in child first language loss: A preliminar case study investigation. *International Journal of Bilingualism* 5(4), pp. 377-401. doi: 10.1177/13670069010050040101

Arche, M.J. 2006. *Individuals in Time: Tense, aspect and the individual/stage distinction*. Amsterdam: John Benjamins. doi: 10.1075/la.94

Arche, M.J. 2014. The construction of viewpoint aspect: the imperfective revisited. *Natural Language & Linguistic Theory* 32(3), pp. 791-831. doi: 10.1007/s11049-013-9209-5

Au, T.K.-F., L.M. Knightly, S.-A. Jun, and J.S. Oh. 2002. Overhearing a language during childhood. *Psychological Science* 13(3), pp. 238-243. doi: 10.1111/1467-9280.00444

Baker, M. 2008. The macroparameter in a microparametric world. In T. Biberauer (ed.) *The limits of syntactic variation*. Amsterdam: John Benjamins, pp. 351-373. doi: 10.1075/la.132.16bak

Bayram, F., J. Rothman, M. Iverson, T. Kupisch, D. Miller, E. Puig-Mayenco, and M. Westergaard. 2019. Differences in use without deficiencies in competence: passives in the Turkish and German of Turkish heritage speakers in Germany. *International Journal of Bilingual Education and Bilingualism* 22(8), pp. 919-939. doi: 10.1080/13670050.2017.1324403

Beaudrie, S., and C. Ducar. 2005. Beginning university heritage programs: Creating a space for all heritage language learners. *Heritage Language Journal* 3, 1, pp. 1-26. doi: 10.46538/hlj.3.1.1

Benmamoun, A., S. Montrul, and M. Polinsky. 2013. Heritage languages and their speakers: Opportunities and challenges for linguistics. *Theoretical Linguistics* 39(3-4), pp. 129-181. doi: 10.1515/tl-2013-0009

Biberauer, T. 2019. Factors 2 and 3: Towards a principles approach. *Catalan Journal of Linguistics* special issue 2019, pp. 45-88.. doi: 10.5565/rev/catjl.219

Block, D. 2008. The Increasing Presence of Spanish-Speaking Latinos in London: An Emergent Community? *Journal of Language, Identity & Education* 7(1), pp. 5-21. doi: 10.1080/15348450701804680

Borer, H. 1984. *Parametric Syntax: Case studies in Semitic and Romance languages*. Dordrecht: Foris.

Borer, H. 2005. *Structuring Sense, vol. 2: The Normal Course of Events*. Oxford: Oxford University Press.

Bybee, J. 1994. The grammaticalization of zero. Asymmetries in tense and aspect systems. In W. Pagliuca (ed.) *Perspectives on Grammaticalization*. Amsterdam: John Benjamins, pp. 235-254. doi: 10.1075/cilt.109.02byb

Carreira, M. 2004. Seeking explanatory adequacy: A dual approach to understanding the term "heritage language learner". *Heritage Language Journal* 2, 1, pp. 1-25. doi: 10.46538/hlj.2.1.1

Carroll, S. 1999. Putting 'input' in its proper place. *Second Language Research* 15(4), pp. 337-388. doi: 10.1191/026765899674928444

Carroll, S. 2001. *Input and evidence: The raw material of second language acquisition*. Amsterdam: John Benjamins.

Castro, M.J. 1992. On the curious question of language in Miami. In J. Crawford (ed.) *Language Loyalties: A source book on the Official English controversy*. Chicago: University of Chicago Press, pp. 178-185.

Cazzoli-Goeta, M., and M. Young-Scholten. 2011. *Yo gusto*… Expanding choice or syntactic attrition? In K. Potowski, and J. Rothman (eds.) *Bilingual Youth: Spanish in English-speaking societies*. Amsterdam: John Benjamins, pp. 201-226. doi: 10.1075/sibil.42.13caz

Cho, J., and R. Slabakova. 2014. Interpreting definiteness in a second language without articles: The case of L2 Russian. *Second Language Research* 30(2), pp. 159-190. doi: 10.1177/0267658313509647

Chomsky, N. 1959. Review: *Verbal Behavior* by B. F. Skinner. *Language* 35(1), pp. 26-58. doi: 10.2307/411334

Chomsky, N. 1965. *Aspects of the theory of syntax*. Cambridge, MA: MIT Press.

Chomsky, N. 1981. *Lectures on government and binding: the Pisa lectures*. Dordrecht: Foris Publications.

Chomsky, N. 1986. *Knowledge of language: Its nature, origin, and use*. New York: Praeger.

Chomsky, N. 1991. Some notes on economy of derivation and representation. In R. Freidin (ed.) *Principles and parameters in comparative grammar*. Cambridge, MA: MIT Press, pp. 417-454.

Chomsky, N. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.

Chomsky, N. 2001. Beyond Explanatory Adequacy. *MIT Occasional Papers in Linguistics* 20, pp. 1-28. Available from http://mit.edu/mitwpl.

Chomsky, N. 2005. Three Factors in Language Design. *Linguistic Inquiry* 36(1), pp. 1-22. doi: 10.1162/0024389052993655

Comrie, B. 1976. *Aspect: an introduction to the study of verbal aspect and related problems*. Cambridge, UK: Cambridge University Press.

Corder, S.P. 1967. The significance of learner's errors. *International Review of Applied Linguistics* 5, pp. 161-170. doi: 10.1515/iral.1967.5.1-4.161

Cuza, A. 2010. The L2 acquisition of aspectual properties in Spanish. *Canadian Journal of Linguistics* 55(2), pp. 181-208. doi: 10.1353/cjl.2010.0007

Cuza, A., and L. Miller. 2015. The protracted acquisition of past tense aspectual values in child heritage Spanish. In R. Klassen, J.M. Liceras, and E. Valenzuela (eds.) *Hispanic Linguistics at the Crossroads: Theoretical Linguistics, Language Acquisition and Language Contact*. Amsterdam: John Benjamins, pp. 211-230. doi: 10.1075/ihll.4.11cuz

Cuza, A., and R. Pérez-Tattam. 2016. Grammatical gender selection and phrasal word order in child heritage Spanish: A feature re-assembly approach. *Bilingualism: Language and Cognition* 19(1), pp. 50-68. doi: 10.1017/S1366728914000893

Cuza, A., R. Pérez-Tattam, E. Barajas, L. Miller, and C. Sadowski. 2013. The development of tense and aspect morphology in child and adult heritage speakers. In J. Schweiter (ed.) *Innovative Research and Practices in Second Language Acquisition and Bilingualism*. Amsterdam: John Benjamins, pp. 193-220. doi: 10.1075/lllt.38.12cuz

De Swart, H. 1998. Aspect Shift and Coercion. *Natural Language & Linguistic Theory* 16(2), pp. 347-385. doi: 10.1023/A:1005916004600

Demirdache, H., and M. Uribe-Etxebarria. 2000. The Primitives of Temporal Relations. In R. Martin, D. Michaels, J. Uriagereka, and S.J. Keyser (eds.) *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*. Cambridge, MA: MIT Press, pp. 157-186.

Demirdache, H., and M. Uribe-Etxebarria. 2007. The syntax of time arguments. *Lingua* 117(2), pp. 330-366. doi: 10.1016/j.lingua.2005.07.006

Den Dikken, M. 2018. An incomplete disquisition against 'incomplete acquisition': With particular reference to changes in the distribution of the subjunctive in Spanish. In N.L. Shin and D. Erker (eds.) *Questioning Theoretical Primitives in Linguistic Inquiry*. Amsterdam: John Benjamins, pp. 269-290. doi: 10.1075/sfsl.76.12dik

Deuchar, M., and S. Quay. 2000. *Bilingual Acquisition: Theoretical Implications of a Case Study*. Oxford: Oxford University Press.

Domínguez, L. 2009. Charting the route of bilingual development: Contributions from heritage speakers' early acquisition. *International Journal of Bilingualism* 13(2), pp. 271-287. doi: 10.1177/1367006909339812

Domínguez, L. 2013. *Understanding Interfaces: Second language acquisition and first language attrition of Spanish subject realization and word order variation*. Amsterdam: John Benjamins. doi: 10.1075/lald.55

Domínguez, L. 2019. A 'mixed methods' approach for investigating aspect in a second language: Evidence from the SPLLOC project. *Dutch Journal of Applied Linguistics* 8(1), pp. 41-66. doi: 10.1075/dujal.19011.dom

Domínguez, L., and G. Hicks. 2016. Synchronic change in a multidialectal Spanish community: Evidence from null and postverbal subjects. In A. Cuza, L. Czerwionka, and D. Olson (eds.) *Inquiries in Hispanic Linguistics: From theory to empirical evidence*. Amsterdam: John Benjamins, pp. 53-72. doi: 10.1075/ihll.12.04dom

Domínguez, L., M.J. Arche, and F. Myles. 2011. Testing the Predictions of the Feature Assembly Hypothesis: Evidence from the L2 Acquisition of Spanish Aspect Morphology. In N. Danis, K. Mesh, and H. Sung (eds.) *BUCLD 35: Proceedings of the 35th annual Boston University Conference on Language Development*. Somerville, MA: Cascadilla Press, pp. 183-196.

Domínguez, L., M.J. Arche, and F. Myles. 2017. Spanish Imperfect revisited: Exploring L1 influence in the reassembly of imperfective features onto new L2 forms. *Second Language Research* 33(4), pp. 431-457. doi: 10.1177/0267658317701991

Domínguez, L., G. Hicks, and R. Slabakova. 2019. Terminology choice in generative acquisition research: The case of "incomplete acquisition" in heritage language grammars. *Studies in Second Language Acquisition* 41(2), pp. 241-255. doi: 10.1017/S0272263119000160

Domínguez, L., N. Tracy-Ventura, M.J. Arche, R. Mitchell, and F. Myles. 2013. The role of dynamic contrasts in the L2 acquisition of Spanish past tense morphology. *Bilingualism: Language and Cognition* 16(3), pp. 558-577. doi: 10.1017/S1366728912000363

Engel, D.M., and M.A. Ritz. 2000. The Use of the Present Perfect in Australian English. *Australian Journal of Linguistics* 20(2), pp. 119-140. doi: 10.1080/07268600020006030

Estebanez, S. 1991. The Spanish speech community. In S. Alladina and V. Edwards (eds.) *Multilingualism in the British Isles* vol. 1. London: Longman, pp. 241-253.

Fernández-Dobao, A., and J. Herschensohn. 2020. Present tense verb morphology of Spanish HL and L2 children in dual immersion: Feature Reassembly revisited. *Linguistic Approaches to Bilingualism* 10(6), pp. 775-804. doi: 10.1075/lab.18026.fer

Fernández-Dobao, A., and J. Herschensohn. 2021. Acquisition of Spanish verbal morphology by child bilinguals: Overregularization by heritage speakers and second language learners. *Bilingualism: Language and Cognition* 24(1), pp. 56-68. doi: 10.1017/S1366728920000310

Foreign and Commonwealth Office. 2007. *Latin America to 2020: A UK Public Strategy Paper*. London: Foreign and Commonwealth Office.

Freidin, R., and H. Lasnik. 2011. Some Roots of Minimalism in Generative Grammar. In C. Boeckx (ed.) *The Oxford Handbook of Linguistic Minimalism*. Oxford: Oxford University Press, pp. 1-26. doi: 10.1093/oxfordhb/9780199549368.013.0001

Gallego, A.J. 2011. Parameters. In C. Boeckx (ed.) *The Oxford Handbook of Linguistic Minimalism*. Oxford: Oxford University Press, pp. 523-550. doi: 10.1093/oxfordhb/9780199549368.013.0023

García del Real Marco, I. 2015. *The acquisition of Tense and Aspect in Spanish*. Ph.D. dissertation, Universidad del País Vasco, Vitoria-Gasteiz, Spain. doi: 10810/17303

Giorgi, A., and F. Pianesi. 1997. *Tense and Aspect: From Semantics to Morphosyntax*. Oxford: Oxford University Press.

Goad, H., and L. White. 2004. Ultimate attainment of L2 inflection: Effects of L1 prosodic structure. *EUROSLA Yearbook* 4, pp. 119-145. doi: 10.1075/eurosla.4.07goa

González, P. and Verkuyl, H. 2017. A binary approach to Spanish tense and aspect: on the tense battle about the past. *Borealis: An International Journal of Hispanic Linguistics* 6, 1, pp. 97-138. doi: 10.7557/1.6.1.4096

González, P., M. Jara Yupanqui, and C. Kleinherenbrink. 2018. The microvariation of the Spanish perfect in three varieties. *Isogloss* 4(1), pp. 115-133.

Goodluck, H., and N. Kazanina. 2020. Fragments Along the Way: Minimalism as an Account of Some Stages in First Language Acquisition. *Frontiers in Psychology* 11, no. 584, 8 pp. doi: 10.3389/fpsyg.2020.00584

Grosjean, F. 2010. *Bilingual: Life and Reality*. Cambridge, MA: Harvard University Press.

Guardado, M. 2018. Spanish as a Minority/Heritage Language in Canada and the UK. In K. Potowski (ed.) *The Routledge Handbook of Spanish as a Heritage Language*. Abingdon: Routledge, pp. 537-554. Handbook doi: 10.4324/9781315735139

Guijarro-Fuentes, P. 2012. The acquisition of interpretable feaures in L2 Spanish: Personal *a*. *Bilingualism: Language and Cognition* 50(4), pp. 701-720. doi: 10.1017/S1366728912000144

Guijarro-Fuentes, P., and T. Marinis. 2011. Voicing language dominance: Acquiring Spanish by British English/Spanish bilingual children. In K. Potowski, and J. Rothman (eds.) *Bilingual Youth: Spanish in English-speaking societies*. Amsterdam: John Benjamins, pp. 227-248. doi: 10.1075/sibil.42.14gui

Guijarro-Fuentes, P., A. Pires, and W. Nediger. 2017. Delay in the acquisition of Differential Object Marking by Spanish monolingual and bilingual teenagers. *International Journal of Bilingualism* 21(2), pp. 159-177. doi: 10.1177/1367006915601249

Hauser, M.D., N. Chomsky, and W.T. Fitch. 2002. The faculty of language: What is it, who has it, and how did it evolve? *Science* 298, pp. 1569-1579. doi: 10.1126/science.298.5598.1569

Hawkins, R., and C.Y.-h. Chan. 1997. The partial availability of Universal Grammar in second language acquisition: the 'failed functional features hypothesis'. *Second Language Research* 13(3), pp. 187-226. doi: 10.1191/026765897671476153

Hawkins, R., and S.A. Liszka. 2003. Locating the source of defective past tense marking in advanced L2 English speakers. In R. van Hout, A. Hulk, F. Kuiken, and R.J. Towell (eds.) *The Lexicon-Syntax Interface in Second Language Acquisition*. Amsterdam: John Benjamins, pp. 21-44. doi: 10.1075/lald.30.03haw

Hegarty, M. 2005. *A Feature-based syntax of functional categories: The structure, acquisition and specific impairment of functional systems*. Berlin: Mouton de Gruyter.

Hicks, G., and L. Domínguez. 2020. A model for L1 grammatical attrition. *Second Language Research* 36(2), pp. 143-165. doi: 10.1177/0267658319862011

Hodgson, M. 2003. The Acquisition of Spanish Perfective Aspect: a study on children's production and comprehension. *ZAS Papers in Linguistcs* 29, pp. 105-117. doi: 10.21248/zaspil.29.2003.171

Hodgson, M. 2005. Children's production and comprehension of Spanish grammatical aspect. In R.S. Gess and E.J. Rubin (eds.) *Theoretical and Experimental Approaches to Romance Linguistics*. Amsterdam: John Benjamins, pp. 125-143. doi: 10.1075/cilt.272.09hod

Hornstein, N. 1990. *As Times Goes By: Tense and Universal Grammar*. Cambridge, MA: MIT Press.

van Hout, A. 2016. Lexical and Grammatical Aspect. In J.L. Lidz, W. Snyder, and J. Pater (eds.) *The Oxford Handbook of Developmental Linguistics*. Oxford: Oxford University Press, pp. 587-610. doi: 10.1093/oxfordhb/9780199601264.013.25

Howe, C., and S.A. Schwenter. 2003. Present perfect for preterite across Spanish dialects. *University of Pennsylvania Working Papers in Linguistics* 9(20), pp. 61-75. Available online: https://repository.upenn.edu/pwpl/vol9/iss2/7

Hwang, S.H., and D. Lardiere. 2013. Plural-marking in L2 Korean: A feature-based approach. *Second Language Research* 29(1), pp. 57-86. doi: 10.1177/0267658312461496

Hyltenstam, K., and Abrahamsson, N. 2003. Maturational Constraints in SLA. In C.J. Doughty and M.H. Long (eds.) *Handbook of Second Language Acquisition*. Oxford: Blackwell, pp. 539-588.

Iverson, M.B. 2012. *Advanced language attrition of Spanish in contact with Brazilian Portuguese*. Ph.D. Dissertation, University of Iowa, United States. doi: 10.17077/etd.n06agp66

Johnson, J.S., and E.L. Newport. 1989. Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. *Cognitive Psychology* 21(1), pp. 60-99. doi: 10.1016/0010-0285(89)90003-0

Kelsall, S. 2015. Language ideologies and latinidad at a Latin American school in London. In R. Márquez Reiter and L.M. Rojo (eds.) *A sociolinguistics of diaspora: Latino practices, identities, and ideologies*. Abingdon: Routledge, pp. 138-150.

Klee, C.A., and A. Lynch. 2009. *El Español en contacto con otras lenguas*. Washington, DC: Georgetown University Press.

Klein, W. 1994. *Time in Language*. London: Routledge.

Klein, W. 1995. A time-relational analysis of Russian aspect. *Language* 71(4), pp. 669-695. doi: 10.2307/415740

Kupisch, T. 2013. A new term for a better distinction? *Theoretical Linguistics* 39(3-4), pp. 203-214. doi: 10.1515/tl-2013-0012

Kupisch, T. 2019. 2L1 simultaneous bilinguals as heritage speakers. In M.S. Schmid and B. Köpke (eds.) *The Oxford Handbook of Language Attrition*. Oxford: Oxford University Press, pp. 458-469. doi: 10.1093/oxfordhb/9780198793595.013.36

Kupisch, T., Bayram, F., and Rothman, J. 2017. Terminology matters II: Early bilinguals show cross-linguistic influence but are not attriters. *Linguistic Approaches to Bilingualism* 7(6), pp. 719-724. doi: 10.1075/lab.00012.kup

Kupisch, T., and J. Rothman. 2018. Terminology matters! Why difference is not incompleteness and how early child bilinguals are heritage speakers. *International Journal of Bilingualism* 22(5), pp. 564-582. doi: 10.1177/1367006916654355

Lardiere, D. 2008. Feature assembly in second language acquisition. In J. Liceras, H. Zobl, and H. Goodluck (eds.) *The Role of Formal Features in Second Language Acquisition*. Abingdon: Lawrence Erlbaum Associates, pp. 106-140.

Lardiere, D. 2009. Some thoughts on the contrastive analysis of features in second language acquisition. *Second Language Research* 22(2), pp. 173-227. doi: 10.1177/0267658308100283

Lasnik, H. 2003. On the Extended Projection Principle. *Studies in Modern Grammar* 31, pp. 1-23.

Lenneberg, E.H. 1967. *Biological Foundations of Language*. New York: Wiley.

Liceras, J., H. Zobl, and H. Goodluck. 2008. Introduction. In J. Liceras, H. Zobl, and H. Goodluck (eds.) *The Role of Formal Features in Second Language Acquisition*. Abingdon: Lawrence Erlbaum Associates, pp. 1-20.

Lidz, J., and A. Gagliardi. 2015. How Nature Meets Nurture: Universal Grammar and Statistical Learning. *Annual Review of Linguistics* 1, pp. 333-353. doi: 10.1146/annurev-linguist-030514-125236

Lightfoot, D. 1999. *The Development of Language: Acquisition, Change, and Evolution*. Oxford: Blackwell Publishers.

Lightfoot, D. 2006. *How New Languages Emerge*. Cambridge: Cambridge University Press. doi: 10.1017/CBO9780511616204

Lightfoot, D. 2010. Language acquisition and language change. *WIREs Cognitive Science* 1(5), pp. 677-684. doi: 10.1002/wcs.39

Lipski, J. 2008. *Varieties of Spanish in the United States*. Washington, DC: Georgetown University Press.

Liskin-Gasparro, J. 2000. The Use of Tense-Aspect Morphology in Spanish Oral Narratives: Exploring the Perceptions of Advanced Learners. *Hispania* 83(4), pp. 830-844. doi: 10.2307/346482

Lohndal, T., J. Rothman, T. Kupisch, and M Westergaard. 2019. Heritage language acquisition: What it reveals and why it is important for formal linguistic theories. *Language and Linguistics Compass* 13(12), no. e12357, 19pp. doi: 10.1111/lnc3.12357

Longa, V.M., and G. Lorenzo. 2008. What about a (really) minimalist theory of language acquisition? *Linguistics* 46(3), pp. 541-570. doi: 10.1515/LING.2008.018.

Lynch, A. 2008. The linguistic similarities of Spanish heritage speakers and second language learners. *Foreign Language Annals* 41, 2, pp. 252-281. doi: 10.1111/j.1944-9720.2008.tb03292.x

Markle LaMontagne, J. 2016. *Perfect Timing: Acquisition of the Spanish Present Perfect in a Francophone Context*. Ph.D. dissertation, University of Toronto, Canada. Available online: http://hdl.handle.net/1807/76557

Markle LaMontagne, J., and M.C. Cuervo. 2015. Perfecting the past. In R. Klassen, J.M. Liceras, and E. Valenzuela (eds.) *Hispanic Linguistics at the Crossroads: Theoretical linguistics, language*

acquisition and language contact. Amsterdam: John Benjamins, pp. 191-210. doi: 10.1075/ihll.4.10mar

Markle LaMontagne, J., and A.T. Pérez-Leroux. 2016. In search of the perfect tense. In A. Alba de la Fuente, E. Valenzuela, and C. Martínez Sanz (eds.) *Language Acquisition Beyond Parameters: Studies in honour of Juana M. Liceras*. Amsterdam: John Benjamins, pp. 213-236. doi: 10.1075/sibil.51.09mar

McIlwaine, C. 2008. *The postcolonial practices of international migration: Latin American migration to London*. London: The Leverhulme Trust.

Meisel, J.M. 2011. *First and Second Language Acquisition*. Cambridge: Cambridge University Press. doi: 10.1017/CBO9780511862694

Meisel, J.M. 2014. Heritage Language Learners: Incomplete Acquisition of Grammar in Early Childhood. In A. Enrique-Arias, M.J. Gutiérrez, A. Landa, and F. Ocampo (eds.) *Perspectives in the Study of Spanish Language Variation: Papers in Honor of Carmen Silva-Corvalán*. Santiago de Compostela: Universidade de Santiago de Compostela, pp. 435-464. doi: 10.15304/va.2014.701

Merino, B. 1983. Language loss in bilingual Chicano children. *Journal of Applied Developmental Psychology* 4(3), pp. 277-294. doi: 10.1016/0193-3973(83)90023-0

Mitchell, R., L. Domínguez, M.J. Arche, F. Myles, and E. Marsden. 2008. SPLLOC: A new database for Spanish second language acquisition research. *EUROSLA Yearbook* 8, pp. 287-304. doi: 10.1075/eurosla.8.15smit

Montrul, S. 2002. Incomplete acquisition and attrition of Spanish tense/aspect distinctions in adult bilinguals. *Bilingualism: Language and Cognition* 5(1), pp. 39-68. doi: 10.1017/S1366728902000135

Montrul, S. 2004. *The Acquisition of Spanish: Morphosyntactic development in monolingual and bilingual L1 acquisition and adult L2 acquisition*. Amsterdam: John Benjamins. doi: 10.1075/lald.37

Montrul, S. 2005. Second language acquisition and first language loss in adult early bilinguals: Exploring some differences and similarities. *Second Language Research* 21(3), pp. 199-249. doi: 10.1191/0267658305sr247oa

Montrul, S. 2008. *Incomplete Acquisition in Bilingualism*. Amsterdam: John Benjamins. doi: 10.1075/sibil.39

Montrul, S. 2009. Knowledge of tense-aspect and mood in Spanish heritage speakers. *International Journal of Bilingualism* 13(2), pp. 239-269. doi: 10.1177/1367006909339816

Montrul, S. 2012. The Grammatical Competence of Spanish Heritage Speakers. In S.M. Beaudrie, and M. Fairclough (eds.) *Spanish as a heritage language in the United States: The state of the field*. Washington, DC: Georgetown University Press, pp. 101-120.

Montrul, S. 2013. *El bilingüismo en el mundo hispanohablante*. Oxford: Wiley-Blackwell.

Montrul, S. 2014. Structural changes in Spanish in the United States: Differential object marking in Spanish heritage speakers across generations. *Lingua* 151(B), pp. 177-196. doi: 10.1016/j.lingua.2014.05.007

Montrul, S. 2015. Dominance and proficiency in early and late bilingualism. In C. Silva-Corvalán and J. Treffers-Daller (eds.) *Language Dominance in Bilinguals: Issues of Measurement and Operationalization*. Cambridge, UK: Cambridge University Press, pp. 15-35. doi: 10.1017/CBO9781107375345.002

Montrul, S. 2016. *The Acquisition of Heritage Languages*. Cambridge: Cambridge University Press. doi: 10.1017/CBO9781139030502

Montrul, S. 2018a. Heritage language development: Connecting the dots. *International Journal of Bilingualism* 22(5), pp. 530-546. doi: 10.1177/1367006916654368

Montrul, S. 2018b. Morphology, syntax, and semantics in Spanish as a heritage language. In K. Potowski (ed.) *The Routledge Handbook of Spanish as a Heritage Language*. Abingdon: Routledge, pp. 145-163.

Montrul, S., and S. Perpiñan. 2011. Assessing Differences and Similarities between Instructed Heritage Language Learners and L2 Learners in Their Knowledge of Spanish Tense-Aspect and Mood (TAM) Morphology. *Heritage Language Journal* 8(1), pp. 90-133. doi: https://doi.org/10.46538/hlj.8.1.5

Montrul, S., and R. Slabakova. 2002. The L2 acquisition of morphosyntactic and semantic properties of the aspectual tenses preterite and imperfect. In A.T. Pérez-Leroux and J.M. Liceras (eds.) *The Acquisition of Spanish Morphosyntax: The L1/L2 Connection*. London: Kluwer Academic Publishers.

Montrul, S., and R. Slabakova. 2003. Competence similarities between native and near-native speakers: An investigation of the Preterite-Imperfect contrast in Spanish. *Studies in Second Language Acquisition* 25(3), pp. 351-398. doi: 10.1017/S0272263103000159

Morales Reyes, A., and S. Montrul. 2020. Variational Learning in Child L2 Acquisition? Comprehension of Verbal Agreement in Spanish and English. *Language Learning and Development* 16(3), pp. 211-230. doi: 10.1080/15475441.2020.1737071

Mueller Gathercole, V.C., E.M. Thomas, L. Jones, N. Viñas Guach, N. Young, and E.K. Hughes. 2010. Cognitive effects of bilingualism: digging deeper for the contributions of language dominance, linguistic knowledge, socio-economic status and cognitive abilities. *International Journal of Bilingual Education and Bilingualism* 13(5), pp. 617-664. doi: 10.1080/13670050.2010.488289

Nagy, N., and M. Brook. 2020. Constraints on speech rate: A heritage-language perspective. *International Journal of Bilingualism* online first publication. doi: 10.1177/1367006920920935

Otheguy, R., García, O, and Roca, A. 2000. Speaking in Cuban: The language of Cuban Americans. In S.L. McKay and S.C. Wong (eds.) *New Immigrants In The United States: Readings for Second Language Educators*. Cambridge: Cambridge University Press, pp. 165-188.

Otheguy, R., and Zentella, A.C. 2012. *Spanish in New York: Language contact, dialectal levelling, and structural continuity*. Oxford: Oxford University Press.

Paffey, D. 2019a. Spanish language visibility and the "making of presence" in the linguistic landscape of London. In A. Lynch (ed.) *The Routledge Handbook of Spanish in the Global City*. Abingdon: Routledge, pp. 204-233. Handbook doi: 10.4324/9781315716350

Paffey, D. 2019b. Global Spanish(es) in a global city: linguistic diversity among learners of Spanish in London. *Journal of Spanish Language Teaching* 6(2), pp. 131-149. doi: 10.1080/23247797.2019.1676983

Paradis, J., and Genesee, F. 1996. Syntactic Acquisition in Bilingual Children: Autonomous or Interdependent? *Studies in Second Language Acquisition* 18, 1, pp. 1-25. doi: 10.1017/S0272263100014662

Pascual y Cabo, D. 2015. Issues in Spanish heritage morphosyntax. *Studies in Hispanic and Lusophone Linguistics* 8(2), pp. 389-401. doi: 10.1515/shll-2015-0015

Pascual y Cabo, D. 2016. Charting the past, present, and future of Spanish heritage language research. In D. Pascual y Cabo (ed.) *Advances in Spanish as a Heritage Language*. Amsterdam: John Benjamins, pp. 1-10. doi: 10.1075/sibil.49.01pas

Pascual y Cabo, D., and J. Rothman. 2012. The (II)Logical Problem of Heritage Speaker Bilingualism and Incomplete Acquisition. *Applied Linguistics* 33(4), pp. 450-455. doi: 10.1093/applin/ams037

Pascual y Cabo, D., and J. DeLaRosa-Prada. 2016. Understanding the Spanish heritage language speaker/learner. *EuroAmerican Journal of Applied Linguistics and Languages* 2(2), pp. 1-10. doi: 10.21283/2376905X.3.67

Pearl, L. forthcoming. Can Minimalism help us better understand how children solve language acquisition? In K. Grohmann and E. Leivada (eds.) *The Cambridge Hanbook of Minimalism*. Available online: https://lingbuzz.net/lingbuzz/005542.

Pearl, L. In press. Theory and predictions for the development of morphology and syntax: A Universal Grammar + statistics approach. *Journal of Child Language* online first publication, 30pp. doi: 10.1017/S0305000920000665

Perez-Cortes, S. 2016. Acquiring obligatory and variable mood selection: Spanish heritage speakers and L2 learners' performance in desideratives and reported speech contexts. Ph.D. dissertation, Rutgers, The State University of New Jersey, United States. doi: 10.7282/T3B27XG0

Perez-Cortes, S., M.T. Putnam, and L. Sánchez. 2019. Differential Access: Asymmetries in Accessing Features and Building Representations in Heritage Language Grammars. *Languages* 4, no. 81, 27pp. doi: 10.3390/languages4040081

Pérez-Leroux, A.T., A. Cuza, M. Majzlanova, and J. Sánchez-Naranjo. 2008. Non-native recognition of iterative and habitual meanings of Spanish preterite and imperfect tenses. In J.M. Liceras, H. Zobl, and H. Goodluck (eds.) *The Role of Formal Features in Second Language Acquisition*. London: Lawrence Erlbaum Associates, pp. 432-451.

Pires, A., and J. Rothman. 2009. Disentangling sources of incomplete acquisition: An explanation for competence divergence across heritage grammars. *International Journal of Bilingualism* 13(2), pp. 211-238. doi: 10.1177%2F1367006909339806

Plonsky, L., and F.L. Oswald. 2014. How Big is "Big"? Interpreting Effect Sizes in L2 Research. *Language Learning* 64(4), pp. 878-912. doi: 10.1111/lang.12079

Plonsky, L., and F.L. Oswald. 2017. Multiple regression as a flexible alternative to ANOVA in L2 research. *Studies in Second Language Acquisition* 39(3), pp. 579-592. doi: 10.1017/S0272263116000231

Polinsky, M. 1997. American Russian: Language Loss Meets Language Acquisition. In W. Browne, E. Dornische, N. Kondrashova, and D. Zec (eds.) *Formal Approaches to Slavic Linguistics: Cornell Meeting*. Ann Arbor: Michigan Slavic Publications, pp. 370-406.

Polinsky, M. 2006. Incomplete Acquisition: American Russian. *Journal of Slavic Linguistics* 14(2), pp. 191-262. Available online: https://www.jstor.org/stable/24599616

Polinsky, M. 2008. Gender under Incomplete Acquisition: Heritage Speakers' Knowledge of Noun Categorization. *Heritage Language Journal* 6(1), pp. 40-71. doi: 10.46538/hlj%206.13

Polinsky, M. 2011. Reanalysis in adult heritage language: New evidence in support of attrition. *Studies in Second Language Acquisition* 33(2) pp. 305-328. doi: 10.1017/S027226311000077X

Polinsky, M. 2016a. Structure vs. use in heritage language. *Linguistics Vanguard* 2(1), pp. 1-14. doi: 10.1515/lingvan-2015-0036

Polinsky, M. 2016b. Looking ahead. In D. Pascual y Cabo (ed.) *Advances in Spanish as a Heritage Language*. Amsterdam: John Benjamins, pp. 325-346. doi: 10.1075/sibil.49.17pol

Polinsky, M. 2018a. *Heritage Languages and Their Speakers*. Cambridge: Cambridge University Press. doi: 10.1017/9781107252349

Polinsky, M. 2018b. Bilingual children and adult heritage speakers: The range of comparison. *International Journal of Bilingualism* 22(5), pp. 547-563. doi: 10.1177/1367006916656048

Polinsky, M., and G. Scontras. Understanding heritage languages. *Bilingualism: Language and Cognition* 23(1), pp. 4-20. doi: 10.1017/S1366728919000245

Potowski, K. 2008. "I was raised talking like my mom": The influence of mothers in the development of MexiRicans' phonological and lexical features. In M. Niño-Murcia and J. Rothman (eds.) *Bilingualism and identity: Spanish at the crossroads with other languages*. Amsterdam: John Benjamins, pp. 201-220.

Potowski, K. 2011. Intrafamilial Dialect Contact. In M. Díaz-Campos (ed.) *The Handbook of Hispanic Sociolinguistics*. Oxford: Blackwell, pp. 579–597.

Pousada, A., and S. Poplack. 1982. No case for convergence: The Puerto Rican Spanish verb system in a language contact situation. In J.A. Fishman, and G. Keller (eds.) *Bilingual Education for Hispanic Students in the United States*. New York: Columbia University Teacher's College Press, pp. 207-240.

Pozo-Gutiérrez, A. 2003. Presencia española en el sur de Inglaterra: una emigración silenciosa e invisible. *Migraciones y Exilios* 4, pp. 79-90. Available online: https://dialnet.unirioja.es/servlet/articulo?codigo=2326704

Pozo-Gutiérrez, A. 2005. Emigración española en Inglaterra: Prácticas asociativas, integración e identidad. *Documentos de Trabajo de la Fundación 1º de* Mayo 2, 37pp.

Pozo-Gutiérrez, A. 2006. 'From neglect to re-discovery': Language and identity amongst Spanish migrants in the United Kingdom. *International Journal of Iberian Studies* 19(3), pp. 205-230. doi: 10.1386/ijis.19.3.205_1

Prévost, P., and L. White. 2000. Missing Surface Inflection or Impairment in second language acquisition? Evidence from tense and agreement. *Second Language Research* 16(2), pp. 103-133. doi: 10.1191/026765800677556046

Putnam, M.T., and L. Sánchez. 2013. What's so incomplete about incomplete acquisition? A prolegomenon to modelling heritage language grammars. *Linguistic Approaches to Bilingualism* 3(4), pp. 478-508. doi: 10.1075/lab.3.4.04put

Putnam, M.T., S. Perez-Cortes, and L. Sánchez. 2019. Language Attrition and the Feature Reassembly Hypothesis. In M.S. Schmid and B. Köpke (eds.) *The Oxford Handbook of Language Attrition*. Oxford: Oxford University Press, pp. 18-24. doi: 10.1093/oxfordhb/9780198793595.013.3

Quené, H. 2010. How to design and analyse language acquisition studies. In E. Blom and S. Unsworth (eds.) *Experimental Methods in Language Acquisition Research*. Amsterdam: John Benjamins, pp. 269-284. doi: 10.1075/lllt.27.15que

R Core Team. 2017. *R: A language and environment for statistical computing, version 4.0.2* [software]. Vienna: R Foundation for Statistical Computing.

Real Academia Española y Asociación de las Academias la Lengua Española. 2010. *Nueva gramática de la lengua española: Manual*. Madrid: Espasa.

Reichenbach, H. 1947. *Elements of Symbolic Logic*. New York: The Free Press.

Rizzi, L., and G. Cinque. 2016. Functional Categories and Syntactic Theory. *Annual Review of Linguistics* 2, pp. 139-163. doi: 10.1146/annurev-linguistics-011415-040827

Roach, P. 1998. Myth 18: Some languages are spoken more quickly than others. In L. Bauer and P. Trudgill (eds.) *Language Myths*. London: Penguin Books, pp. 150-158.

Rothman, J. 2007. Heritage speaker competence differences, language change, and input type: Inflected infinitives in Heritage Brazilian Portuguese. *International Journal of Bilingualism* 11(4), pp. 359-389. doi: 10.1177/13670069070110040201

Rothman, J. 2009. Understanding the nature and outcomes of early bilingualism: Romance languages as heritage languages. *International Journal of Bilingualism* 13(2), pp. 155-163. doi: 10.1177/1367006909339814

Rothman, J., and R. Slabakova. 2018. The generative approach to SLA and its place in modern second language studies. *Studies in Second Language Acquisition* 40(2), pp. 417-442. doi: 10.1017/S0272263117000134

Rothman, J., J. González Alonso, and E. Puig-Mayenco. 2019. *Third Language Acquisition and Linguistic Transfer*. Cambridge: Cambridge University Press. doi: 10.1017/9781316014660

Salaberry, R. 1999. The Development of Past Tense Verbal Morphology in Classroom L2 Spanish. *Applied Linguistics* 20(2), pp. 151-178. doi: 10.1093/applin/20.2.151

Salaberry, R. 2003. Tense Aspect in Verbal Morphology. *Hispania* 86(3), pp. 559-573. doi: 10.2307/20062909

Salaberry, M.R. 2008. *Marking Past Tense in Second Language Acquisition*. London: Continuum.

Schmid, M.S., and B. Köpke. 2017. The relevance of first language attrition to theories of bilingual development. *Linguistic Approaches to Bilingualism* 7(6), pp. 637-667. doi: 10.1075/lab.17058.sch

Schmid, M.S., and T. Karayayla. 2020. The Roles of Age, Attitude, and Use in First Language Development and Attrition of Turkish-English Bilinguals. *Language Learning* 70(S1), pp. 54-84. doi: 10.1111/lang.12361

Schulz, P., and A. Grimm. 2019. The Age Factor Revisited: Timing in Acquisition Interacts With Age of Onset in Bilingual Acquisition. *Frontiers in Psychology* 14, no. 2732, 18pp. doi: 10.3389/fpsyg.2018.02732

Schwartz, B.D., and R. Sprouse. 1996. L2 cognitive states and the Full Transfer/Full Access model. *Second Language Research* 12(1), pp. 40-72. doi: 10.1177/026765839601200103

Schwartz, B.D., and R. Sprouse. 2021. The Full Transfer/Full Access model and L3 cognitive states. *Linguistic Approaches to Billingualism* 11(1), pp. 1-29. doi: 10.1075/lab.20055.sch

Schwenter, S.A. 1994. The Grammaticalization of an Anterior IN Progress: Evidence from a Peninsular Spanish Dialect. *Studies in Language* 18(1), pp. 71-111. doi: 10.1075/sl.18.1.05sch

Schwenter, S.A., and R. Torres Cacoullos. 1994. Defaults and indeterminacy in temporal grammaticalisation: The 'perfect' road to perfective. *Language Variation and Change* 20(1), pp. 1-39. doi: 10.1017/S0954394508000057

Scontras, G., Z. Fuchs, and M. Polinsky. 2015. Heritage language and linguistic theory. *Frontiers in Psychology* 6, no. 1545, 20 pp. doi: 10.3389/fpsyg.2015.01545

Scontras, G., M. Polinsky, and Z. Fuchs. 2018. In support of representational economy: Agreement in heritage Spanish. *Glossa: a journal of general linguistics* 3(1), no. 1, 29 pp. doi: doi.org/10.5334/gjgl.164

Segalowitz, N. 2010. *Cognitive Bases of Second Language Fluency*. Abingdon: Routledge.

Serratrice, L. 2013. Cross-linguistic influence in bilingual development: Determinants and mechanisms. *Linguistic Approaches to Bilingualism* 3(1), pp. 3-25. doi: 10.1075/lab.3.1.01ser

Silva-Corvalán, C. 1991. Cross-generational bilingualism: theoretical implications of language attrition. In T. Huebner and C.A. Ferguson (eds.) *Cross Currents in Second Language Acquisition and Linguistic Theory*. Amsterdam: John Benjamins, pp. 325-346.

Silva-Corvalán, C. 1994. *Language Contact and Change: Spanish in Los Angeles*. Oxford: Clarendon Press.

Silva-Corvalán, C. 2003. Linguistic consequences of reduced input in bilingual first language acquisition. In S. Montrul and F. Ordoñez (eds.) *Linguistic Theory and Language Development in Hispanic Languages*. Somerville: Cascadilla Press, pp. 375-397. doi: 10.1075/lald.2.18sil

Silva-Corvalán, C. 2014. *Bilingual Language Acquisition: Spanish and English in the First Six Years*. Cambridge: Cambridge University Press. doi: 10.1017/CBO9781139162531

Silva-Corvalán, C. 2018. Simultaneous bilingualism: Early developments, incomplete later outcomes? *International Journal of Bilingualism* 22(5), pp. 497-512. doi: 10.1177/1367006916652061

Skinner, B.F. 1957. *Verbal behaviour*. New York: Appleton-Century-Crofts.

Slabakova, R. 2008. *Meaning in the second language*. Berlin: Walter de Gruyter.

Slabakova R. 2009. Features or parameters: which one makes second language acquisition easier, and more interesting to study. *Second Language Research* 25(2), pp. 313-324. doi: 10.1177/0267658308100291

Slabakova, R., and S. Montrul. 2002. On viewpoint aspect interpretation and its L2 acquisition: A UG perspective. In M.R. Salaberry and Y. Shirai (eds.) *The L2 Acquisition of Tense-Aspect Morphology*. Amsterdam: John Benjamins, pp. 363-398. doi: 10.1075/lald.27.15sla

Slabakova, R., and S. Montrul. 2003. Genericity and Aspect in L2 Acquisition. *Language Acquisition* 11(3), pp. 165-196. doi: 10.1207/s15327817la1103_2

Slabakova, R., and S. Montrul. 2008. Aspectual Shifts: Grammatical and Pragmatic Knowledge in L2 Acquisition. In J.M. Liceras, H. Zobl, and H. Goodluck (eds.) *The Role of Formal Features in Second Language Acquisition*. London: Lawrence Erlbaum Associates, pp. 452-483.

Sorace, A. 2011. Pinning down the concept of "interface" in bilingualism. *Linguistic Approaches to Bilingualism* 1(1), pp. 1-33. doi: 10.1075/lab.1.1.01sor

Stowell, T. 1993. Syntax of tense. Unpublished manuscript, University of California, Los Angeles.

Torres, L. 1989. Mood selection among New York Puerto Ricans. *International Journal of the Sociology of Language* 79, pp. 67-78. doi: 10.1515/ijsl.1989.79.67

Travis, L. 2008. The role of features in syntactic theory and language variation. In J. Liceras, H. Zobl, and H. Goodluck (eds.) *The Role of Formal Features in Second Language Acquisition*. Abingdon: Lawrence Erlbaum Associates, pp. 22-47.

Tsimpli, I.M., and M. Dimitrakopoulou. 2007. The Interpretability Hypothesis: evidence from wh-interrogatives in second language acquisition. *Second Language Research* 23(2), pp. 215-242. doi: 10.1177/0267658307076546

Tyrell, N., P. Guijarro-Fuentes, and C. Blandon. 2014. Intergenerational heritage language practices: A case study of Spanish-speaking families in Britain. *Applied Linguistics Review* 5(2), pp. 307-328. 10.1515/applirev-2014-0014

Unsworth, S. 2013. Assessing the role of current and cumulative exposure in simultaneous bilingual acquisition: The case of Dutch gender. *Bilingualism: Language and Cognition* 16(1), pp. 86-110. doi: 10.1017/S1366728912000284

Unsworth, S. 2019. Quantifying language experience in heritage language development. In M.S. Schmid and B. Köpke (eds.) *The Oxford Handbook of Language Attrition*. Oxford: Oxford University Press, pp. 434-445. doi: 10.1093/oxfordhb/9780198793595.013.34

Valdés, G. 1995. The teaching of minority languages as academic subjects: Pedagogical and theoretical challenges. *Modern Language Journal* 79, 3, pp. 299-328. doi: 10.1111/j.1540-4781.1995.tb01106.x

Valdés, G. 2000a. Introduction. *Spanish for Native Speakers*, Volume I. AATSP Professional Development Series Handbook for teachers K-16. New York: Harcourt College.

Valdés, G. 200b. Bilingualism and Language Use among Mexican Americans. In S. McKay and S. Wong *New Immigrants in the United States*. Cambridge: Cambridge University Press, pp. 99-136.

Velázquez, I. 2018. *Household Perspectives on Minority Language Maintenance and Loss: Language in the Small Spaces*. Bristol: Multilingual Matters. doi: 10.21832/9781788922289

Vendler, Z. 1967. *Linguistics in Philosophy*. Ithaca: Cornell University Press.

Verkuyl, H. 1999. *Aspectual Issues: Studies on time and quantity*. Stanford: CSLI Publications.

Verkuyl, H. 2019. Naïve physics vs compositionality in evaluating the Lexical Aspect Hypothesis. *Dutch Journal of Linguistics* 8(1), pp. 5-23. doi: 10.1075/dujal.19004.ver

Westergaard, M. 2008. *The Acquisition of Word Order: Micro-cues, information structure, and economy*. Amsterdam: John Benjamins. doi: 10.1075/la.145

White, L. 2003. *Second Language Acquisition and Universal Grammar*. Cambridge: Cambridge University Press. doi: 10.1017/CBO9780511815065

Wickham, H. 2016. *ggplot2: Elegant Graphics for Data Analysis* [software]. New York: Springer-Verlag.

Yang, C. 2002. *Knowledge and learning in natural language*. Oxford: Oxford University Press.

Yang, C. 2004. Universal Grammar, statistics, or both? *Trends in Cognitive Sciences* 8(10), pp. 451-456.

Yang, C. 2018. A formalist perspective on language acquisition. *Linguistic Approaches to Bilingualism* 8(6), pp. 665-706.

Yang, C., and S. Montrul. 2017. Learning datives: The Tolerance Principle in monolingual and bilingual acquisition. *Second Language Research* 33(1), pp. 119-144. doi: 10.1177/0267658316673686

Zagona, K. 1990. Times as temporal argument structure. Paper presented at the "Time in Language" conference. Cambridge, MA: MIT.

Zentella, A.C. 1997. *Growing Up Bilingual: Puerto Rican Children in New York*. Oxford: Blackwell Publishing.