

Age and input effects in the acquisition of mood in Heritage Portuguese*

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ABSTRACT

The present study analyzes the effect of age and amount of input in the acquisition of European Portuguese as a heritage language. An elicited production task centred on mood choice in complement clauses was applied to a group of fifty bilingual children (six- to sixteen-year-olds) who are acquiring Portuguese as a minority language in a German dominant environment. The results show a significant effect of the age at testing and the amount of input in the acquisition of the subjunctive. In general, acquisition is delayed with respect to monolinguals, even though higher convergence with the monolingual grammar is observed after twelve years of age. Results also reveal that children with more exposure to the heritage language at home show faster acquisition than children from mixed households: the eight- to nine-year-old age boundary seems

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relevant for those speakers with more exposure, and the twelve- to thirteen-year-old age boundary for those with less exposure.

INTRODUCTION

The acquisition of heritage languages, i.e. minority languages acquired in a migration context, has been a matter of debate in recent literature. Heritage speakers (HSs) acquire two (or more) languages in childhood and thus the acquisition of a heritage language (HL) is an instance of bilingual acquisition. HSs are either simultaneous bilinguals, if they are exposed to the minority and the majority language from birth, or successive bilinguals, if contact with the majority language occurs after extensive exposure to the family (heritage) language. In either case, the age of onset of acquisition (AOA) of the HL is similar to monolinguals. Nonetheless, a HL is defined by becoming a non-dominant language when the speakers start schooling and the amount of input and continued language use radically decreases for the HL (Rothman, 2009). As a result, HSs' linguistic performance became a fertile ground of inquiry, namely allowing researchers to discuss to what extent the steady state of linguistic knowledge ultimately attained by those speakers corresponds to what is attained by monolingual speakers (see the discussion in Montrul, 2008; Rothman, 2007). When divergence between monolingual and HL acquisition is identified, different explanations have been put forward, namely incomplete development or language attrition (Montrul, 2008; Polinsky, 2008), or explanations relating to the quality of the input (Pascual y Cabo & Rothman, 2012; Pires & Rothman, 2009). Other studies highlight the nature of the linguistic property under evaluation, with later-acquired structures showing a more deficient acquisition than early-acquired properties (Flores & Barbosa, 2014; Santos & Flores, 2016). Later-acquired properties are expected to be acquired at an age (school age) in which the child gets reduced input from his/her HL, since the majority language is now the child's dominant language.

It is true, in general, that children vary in the amount of exposure that they have to their ambient language(s). This has been shown to be the case not only for children who grow up with two ambient languages, but also for L1 input in typical monolingual acquisition settings across families and across different language communities (Hart & Risley, 1995; Hoff, 2006; Hurtado, Marchman & Fernald, 2008). Even innatism, which relativizes the role of input in grammatical development (e.g. Wexler, 1991), presupposes a minimal amount of exposure to primary linguistic data in order to activate the language acquisition device. There has to be a minimal threshold of exposure responsible for triggering acquisition. Limited exposure below this supposed baseline may trigger comprehension and perception skills, but not productive ones, as seems to be the case with 'overhearers' (Au, Knightly, Jun & Oh,

2002). It has indeed been shown that restricted input to one language in bilingual acquisition settings influences the development of lexical knowledge (Bialystok & Luk, 2012; Hoff & Naigles, 2002; Thordardottir, 2011), pronunciation (Kupisch, Barton, Klaschik, Lein, Stangen & van de Weijer, 2014) and morphosyntactic knowledge (Gathercole & Thomas, 2009; Rodina & Westergaard, 2015; Unsworth, Argyri, Cornips, Hulk, Sorace & Tsimpli, 2014). However, more studies are needed in order to determine to what extent the quantity of input may limit the acquisition of different areas of grammar.

Many studies showing input effects in bilingual acquisition focus on early successive bilinguals, and measure the effects of length of exposure to the target language, which interacts with the age of onset (see discussion in Unsworth, 2013). In this paper, and by studying the acquisition of a HL, we intend to evaluate the effects of the amount of input, in an acquisition setting in which the age of onset is similar to that of monolinguals. In this case, we will evaluate the quantity of input through indirect measures focused on children's families, namely considering households with first- or second-generation parents and the existence of older siblings. Particularly, we evaluate the effect of the amount of input in the acquisition of mood selection in complement clauses, a matter of semantics that interacts with the lexicon (lexical semantics of the matrix verb) and syntax (of complement clauses). The study is based on European Portuguese (EP) acquired as a HL by children and adolescent speakers whose dominant language is German.

Most HL studies test adult HSs and therefore cannot distinguish effects of acquisition from effects of subsequent language attrition. In this study, we test individuals who are still acquiring the property at stake. Since use of the subjunctive mood has been shown to stabilize late, we take into account a large age span (six–sixteen years of age at the moment of testing) and adopt a cross-sectional approach, which will allow us to infer a scale of acquisition. HSs' results will be compared to previous results from a study on monolingual acquisition of the EP subjunctive (Jesus, 2014), in terms of both the scale and the rate of acquisition (we will therefore look at age). When discussing age, we will confirm the relevancy of certain age thresholds identified in preceding work on language acquisition and language attrition. Additionally, we tested eight adult HSs, who represent the ultimate attainment of HL acquisition.

INPUT EFFECTS AND THE ACQUISITION OF A HERITAGE LANGUAGE

The effects of limited exposure to primary linguistic data have attracted recent attention in the study of bilingual acquisition (see, e.g. Grüter & Paradis, 2014). It has been suggested that restricted input to one language in bilingual acquisition settings may influence the development of different linguistic domains, e.g. vocabulary size (Hoff, Core, Place, Rumiche,

Senor & Parra, 2012) or morphosyntactic development (Austin, 2009; Blom, 2010; Gathercole, 2007; Gathercole & Thomas, 2009; Hoff *et al.*, 2012; Rodina & Westergaard, 2015; Schlyter, 1993; Suchtelen, 2014; Thomas, Williams, Jones, Davies & Binks, 2014; Unsworth, 2014; Unsworth *et al.*, 2014; among many others). Schlyter (1993) and Blom (2010), for instance, claim that bilingual children with very unbalanced language input develop a 'weaker language', displaying a slower rate of acquisition and structural transfer from the stronger language. The stronger (ambient) language, on the other hand, seems to develop indistinguishably from that of monolingual children of the same language background. As Meisel (2007) points out, the hypothesis of a weaker language suggests that exposure since birth is a necessary but not sufficient condition for native-like language acquisition. This seems to suggest that sufficient exposure to the primary linguistic data must happen at the appropriate age in order to be successful. Several studies argue in favour of this idea. Gathercole (2007), Gathercole and Thomas (2009), and Thomas *et al.* (2014), for instance, show that the grammatical development of the minority language (Welsh, in their case) depends on the amount of exposure to this language at home and in school. Several other studies, which include parental input as an extralinguistic variable, reach similar conclusions (e.g. Rodina & Westergaard, 2015; Suchtelen, 2014). Rodina and Westergaard (2015), who analyze the acquisition of gender, show that Norwegian–Russian bilingual children from households where the two parents speak the minority language, Russian, outperform bilingual children from mixed households, who have less exposure to Russian.

Nevertheless, many studies which stress the role of the amount of input in the development of the minority language show that differences found at earlier ages are overcome at later ages in some domains (Gathercole, 2007; Gathercole, Thomas, Roberts, Hughes & Hughes, 2013; Paradis, Tremblay & Crago, 2014; Unsworth, 2014). Consequently, they suggest that bilingual children may take longer to acquire certain structures of their weaker language, but they tend to reach native-like competence, even if at an older age, and follow the same acquisition path. This observation shows that input differences mainly affect the rate of acquisition but not its outcome (see also Meisel, 2007). This is strengthened by studies that include older children or adults (Gathercole *et al.*, 2013). As an explanation for this protracted, yet native-like development, it has been suggested that children who have restricted input to one language may take more time to accumulate positive evidence (Gathercole, 2007; Gathercole & Thomas, 2009). Consequently, they will need more time to accumulate this evidence if they have less exposure to the target language (see also the concept of 'cumulative' exposure, suggested by Unsworth, 2013).

However, not all linguistic domains seem to be similarly affected by reduced input. Input effects have been shown with respect to the acquisition of grammatical structures that present opaque form–function mappings, such as the gender system and plural morphology in Welsh (Thomas & Gathercole, 2007; Thomas *et al.*, 2014) or the gender system in Dutch or Russian (Blom, Poliřenskà & Unsworth, 2008; Cornips & Hulk, 2008; Polinsky, 2008; Rodina & Westergaard, 2015; Unsworth, 2013).

Also, structures that are syntactically very complex and/or are known to stabilize late in monolingual acquisition are good candidates for delayed acquisition in bilingual and, particularly, HL acquisition. This is the case of clitic placement in EP (Flores & Barbosa, 2014), or structures which only occur in formal varieties of the target language, as described by Meisel, Elsig, and Bonnesen (2011) for certain French interrogatives. According to Tsimpli (2014), late acquisition is expected in general in the case of all non-core linguistic phenomena, which are related to language-external resources (such as working memory) or to interface phenomena. In the case of these phenomena, Tsimpli's prediction is that acquisition by bilingual subjects is determined only by input and not by age of onset. What is essential for us is that timing in L1 development of the analyzed properties may be a further variable that has to be taken into account in studies on input effects in bilingualism. It seems that structures which are acquired late in monolingual acquisition, due either to their complexity, interface nature, or absence in colloquial varieties, may show an even more protracted development in bilinguals' weaker language. Consequently, the division *per se* into early, late, and very late phenomena is very useful for us, if we relate the nature of the grammatical property with the amount of input together with maturational constraints, therefore not considering the factors in isolation (see Long & Rothman's, 2014, comments).

As for the interaction between the quantity of input and the type of property under analysis, if we assume that there are sensitive periods for the acquisition of different language domains (Meisel, 2013), we can suggest that insufficient exposure during the optimal phase of acquisition could indeed lead to an acquisition delay (or even failure). In the case of late (or very late) properties, and in cases of reduced exposure at a later age, which happens with the HL child, the input the child receives during the relevant period may not be sufficient and, consequently, this delays its stabilization. It has been suggested that in these cases bilingual children may not catch up and do not reach native-like knowledge in these domains (Thomas *et al.*, 2014). The present study aims precisely at analyzing the effects of reduced input in the bilingual acquisition of a property, the distribution of the subjunctive mood in European Portuguese complement clauses, which stabilizes after the preschool years in monolingual acquisition. In the next section, we summarize relevant facts concerning

mood contrasts in EP complement clauses and its acquisition. Since our subjects are HSs of EP living in Germany, we also summarize relevant facts concerning the distribution of mood in German.

MOOD IN EP AND GERMAN

Distribution of indicative and subjunctive moods in EP

Portuguese verbal morphology shows different moods, the main ones being the indicative and the subjunctive. The selection of one or another mood in complement clauses is basically constrained by the meaning of the matrix predicate, though with some verb classes factors such as negation or the tense of the main clause may interfere with the selection of mood for complement clauses (see, e.g. Marques, 2013).

In EP, the indicative is selected for complement clauses introduced by the following verb classes:

- (1) a. Strong epistemic verbs (which express knowledge or a high degree of belief), such as *saber* ‘know’ or *pensar* ‘think’
- b. Declarative verbs, such as *dizer* ‘say’
- c. Commissive verbs, such as *prometer* ‘promise’
- d. Fiction verbs, such as *sonhar* ‘dream’

On the other hand, the subjunctive is selected by verbs like the ones listed below:

- (2) a. Non-epistemic implicative verbs (including verbs such as *deixar* ‘let’ or *conseguir* ‘manage’, and evaluative predicates, such as *lamentar* ‘regret’ or *achar bem* ‘approve’)
- b. Non-epistemic non-implicative verbs (including verbs of volition, such as *querer* ‘want’ and directive verbs, such as *mandar* ‘order’)
- c. Weak epistemic verbs (which express a negative belief or a low degree of belief, such as *duvidar* ‘doubt’)

Concerning (2), it should be said that in Karttunen (1971) implicative verbs are those that allow the inference that the embedded proposition is true in affirmative sentences, but do not allow such inference in negative sentences; here, the term is broadly used to refer to this kind of verbs plus factive verbs, i.e. those whose complement proposition is taken to be true regardless of the truth value of the main proposition. Apart from the verbs mentioned in (2), there is a group of verbs that in EP accepts both moods in the complement clause. This is the case of *acreditar* ‘to believe’ and a group of other verbs with the same core meaning.

Different analyses have been suggested concerning the distinctions of mood in the adult’s grammar. Here, we accept the account of Marques (2013), which is based on EP data. This author proposes that two main

semantic factors intervene in the mood system of EP: epistemicity (the attitude expressed towards the proposition is one of knowledge or belief) and veridicality (as defined in Giannakidou, 1999). According to Giannakidou's concept of veridicality, a propositional operator is veridical if the proposition it introduces is taken to be true by some entity in the relevant model, which corresponds to a set of possible worlds. For instance, factive verbs, such as *to know* or *to regret*, are veridical operators, since their complement clauses are taken to be true by the speaker and the (entity referred to by the) subject of the main clause. Similarly, verbs like *to think* and *to dream* are also veridical operators, since their complement clauses are taken to be true in the worlds that correspond respectively to the beliefs and to the dreams of the main clause's subject.

The fact that a context is veridical does not mean that an epistemic propositional attitude is being openly expressed. For instance, some factive verbs, like *regret*, are veridical, but they are not epistemic. They do not primarily express an attitude of belief, but rather another kind of attitude, that we might call 'evaluative' (see Palmer, 1986, amongst others).

Marques (2013) argues that in EP all the verbs that select an indicative complement express an attitude of knowledge or POSITIVE belief (i.e. they are veridical operators associated with epistemic modality). This is clearly the case of the verbs in (1a), and also the case of declarative (1b) and commissive (1c) verbs: these verbs also express an attitude of belief, committing the subject of the main clause to the truth of the embedded proposition. With fiction verbs (1d), Marques claims that they are also epistemic predicates, with the particularity of the belief being relativized to the relevant model, e.g. the dream world in the case of *to dream* (see Farkas, 1992; Giannakidou, 1999, 2013; a.o.).

As for the verbs that select the subjunctive, most of them (2a, b) do not express a propositional attitude of epistemic nature, but rather express different kinds of attitude (they are associated with, e.g. volition modality, deontic modality, evaluative modality). The only kind of verbs that select the subjunctive and express an epistemic attitude are the equivalent of *to doubt* and verbs (e.g. *acreditar* 'believe') which in EP allow both the indicative and the subjunctive in their complement clauses, the subjunctive being selected when a low degree of belief is expressed.

Notice, however, that the subjunctive occurs in non-veridical contexts as well as in veridical non-epistemic contexts: in fact, some of the verbs selecting the subjunctive are non-veridical (2b, c), whilst others are veridical (2a). Therefore, contrary to what happens in other languages, such as Modern Greek (see, e.g. Giannakidou, 1999), one cannot say that the selection of the subjunctive in EP is driven by non-veridicality alone. Also, one cannot say that the expression of an epistemic attitude is enough for the selection of the indicative in EP. The subjunctive also occurs in

epistemic contexts if they are non-veridical (the case of 2c). Thus, according to Marques' (2013) proposal, the indicative is selected if an epistemic veridical attitude is expressed towards the proposition, the subjunctive being selected for all other cases (i.e. the subjunctive is linked to the expression of both non-epistemic and epistemic non-veridical attitudes).

Therefore, the distribution of mood in EP, which was presented in (1) and (2), can be summarized as in Table 1, where matrix predicates are organized according to the features [\pm epistemic] and [\pm veridical]. In this case, the category of strong epistemic verbs includes both verbs that express an attitude of knowledge or belief and other verbs, namely declarative and commissive verbs, which may also be taken to express an epistemic propositional attitude. Fiction verbs can be said to equally express a strong epistemic propositional attitude, being also [+epistemic; +veridical], but they are kept in the table in a separate category, since in this case the belief must be relativized to a model that is an alternative to (the main clause's subject view of) reality (e.g. the model corresponding to the dream, in the case of the verb *to dream*).

Previous results on the acquisition of mood contrasts in EP

Accepting the analysis of mood detailed above, Jesus (2014) investigated the acquisition of the distribution of the subjunctive by EP monolingual speakers. In this study, an elicited production task was applied to eighty children, aged four to nine, and a control group of twenty adults. The test consisted of a sentence completion task presenting complement clauses which were introduced by verbs pertaining to the classes mentioned above (see previous section). A summary of the results is presented in Table 2.

The results confirm that the adults follow the pattern predicted by Marques' (2013) proposal (see previous section), selecting the subjunctive in [$-$ epistemic] contexts, either under implicative ([+veridical]) or non-implicative ([$-$ veridical]) predicates and in [+epistemic; $-$ veridical], i. e. under weak epistemic predicates. Conversely, they select the indicative in [+epistemic; +veridical] contexts – in this case, the matrix verbs used in the task were strong epistemic and fiction verbs (tested separately). The adult accuracy rate ranged from 97.5% to 100% across all conditions, with the exception of DMC (double mood choice), in which they obtained only 72.5%. This lower rate is explained by the fact that double mood choice epistemic items ([+epistemic; \pm veridical]) present cases in which mood selection is also dependent on the discourse context and may vary according to the speaker's interpretation of the given situation.

Regarding the child data, the results suggest that, between the ages of five and nine, children may already be dealing with some semantic values that are relevant for the EP mood system. Overall, the children showed a preference

TABLE 1. *Mood distribution in EP*

A. Implicative	B. Non-Implicative	C. Weak Epistemic	D. Epistemic DMC	E. Strong Epistemic verbs	F. Fiction verbs
<i>Subjunctive</i>		<i>Subj. or Ind.</i>		<i>Indicative</i>	
[−epistemic; +veridical]	[−epistemic; −veridical]	[+epistemic; −veridical]	[+epistemic; ±veridical]	[+epistemic; +veridical]	[+epistemic; +veridical]
<i>lamentar</i> ‘regret’	<i>querer</i> ‘want’	<i>duvidar</i> ‘doubt’	<i>acreditar</i> ‘believe’ (ind.)	<i>saber</i> ‘know’	<i>sonhar</i> ‘dream’
<i>achar bem</i> ‘approve’	<i>mandar</i> ‘order’	<i>não acreditar</i> ‘not believe’	<i>acreditar</i> ‘believe’ (subj.)	<i>Pensar</i> ‘think’	<i>Finger</i> ‘pretend’
<i>deixar</i> ‘let’ <i>conseguir</i> ‘manage’				<i>dizer</i> ‘say’ <i>descobrir</i> ‘find out’ <i>prometer</i> ‘promise’	

TABLE 2. *Mood selection – EP monolinguals: results by age and condition (accuracy rate %) (Jesus, 2014)*

	A. Implicative	B. Non-Implicative	C. Weak Epistemic	D. Epistemic DMC	E. Strong Epistemic	F. Fiction
	<i>Subjunctive</i>		<i>Subj. or Ind.</i>		<i>Indicative</i>	
	[-epistemic; +veridical]	[-epistemic; -veridical]	[+epistemic; -veridical]	[+epistemic; ±veridical]	[+epistemic; +veridical]	[+epistemic; +veridical]
4	37.5	63.75	27.5	53.75	97.5	77.5
5	56.25	92.5	36.25	52.5	98.75	85
6–7	75	92.5	45	57.5	100	88.75
8–9	95	100	55	62.5	100	98.75
Adults	100	100	97.5	72.5	100	100

for the indicative on [+epistemic; +veridical] contexts, both with strong epistemic and fiction verbs and, even if presenting lower rates, the subjunctive was used rather systematically in [−epistemic], i.e. under implicative and non-implicative matrix predicates. At the age of eight and nine, target-like performance is observed within these conditions: 95% of accuracy with implicative verbs and 100% with non-implicative.

Nevertheless, some critical areas were found. As for the subjunctive conditions, the data revealed a distinction between children's performance with weak epistemic predicates ([+epistemic; −veridical]) vs. implicative and non-implicative predicates ([−epistemic]), the former remaining more problematic until later in acquisition (see the contrast of the scores achieved by the eight- to nine-year-olds in [−epistemic] contexts vs. [+epistemic; −veridical] contexts). Hence, the indicative seems to be associated with [+epistemic] contexts and the subjunctive with [−epistemic] contexts, resulting in non-target indicative production in [+epistemic; −veridical] contexts, i.e. under weak epistemic predicates. However, target-deviant answers in subjunctive conditions do not correspond only to indicative productions. Some infinitive uses were observed, especially in the younger children. The most expressive use of the infinitive was found within [−epistemic] conditions: four-year-olds produced 17.5% of infinitives with both implicative and non-implicative predicates. Nevertheless, at the age of five, this percentage decreases to 5% with implicative verbs and 6.25% with non-implicative verbs. Although the infinitive responses are residual, they can be understood in the light of the SEMANTIC OPPOSITION HYPOTHESIS (Hyams, 2001), which suggests that, from an early age, children may use the infinitive to encode modal distinctions. Alternatively, they may indicate some difficulties with subjunctive morphology (see Jesus, 2014, for discussion).

As for the contexts where the indicative was the expected mood ([+epistemic; +veridical]), children in all age groups preferred the indicative in all the expected contexts tested, i.e. with both strong epistemic and fiction verbs, as already mentioned. However, their performance was worse with fiction verbs, and they surprisingly employed some subjunctive forms in these contexts: in the case of four-year-old children, the accuracy rate with strong epistemic verbs was 97.5%, whereas with fiction verbs it was only 77.5%, and, at the ages of six and seven, when children already show a target-like performance with strong epistemic verbs (producing 100% of indicatives), they still produce some subjunctives with fiction verbs (having 88.75% accurate answers). This was interpreted by Jesus (2014) as suggesting that at some point in development children take the REALIS/IRREALIS opposition as interacting with the distribution of the subjunctive: the complement of a fiction verb is interpreted as an irrealis context. Indeed, in certain languages, such as Russian (Noonan, 1985), the subjunctive may to some extent be associated with the irrealis.

Based on these results, Jesus (2014) argues that younger children show greater sensitivity to the epistemic value, first associating the subjunctive with [–epistemic] contexts and the indicative with [+epistemic] contexts. As they develop, they become more sensitive to veridicality (when combined with epistemicity), being able to use the subjunctive with weak epistemic predicates. In more general terms, this study has also shown that mood in complement clauses is a late-acquired phenomenon, since even eight- and nine-year-olds do not absolutely demonstrate target behaviour.

Mood in German complement clauses

Differing from EP and other Romance languages, in German the selection of mood in complement clauses is not primarily constrained by the meaning of the matrix predicate (Meinunger, 2004). Whereas in Romance languages, in many contexts, the use of the subjunctive is obligatory in certain complement clauses and cannot be replaced by the indicative, in German the indicative mood can be used with all classes of matrix predicates (see (3) for the use of the indicative with a volition verb, which is not possible in EP).

- (3) Ich wollte, dass sie kommt.
 I wanted that she came^{IND}.
 ‘I wanted her to come.’

Even though German grammars formally distinguish between the present subjunctive, called KONJUNKTIV I, and the past subjunctive, called KONJUNKTIV II, there is no clear temporal opposition between the present and past subjunctive. Instead, there are different modal, discursive, and socio-stylistic distributions of both forms (Fabricius-Hansen & Sæbø, 2004; Zifonun, Hoffmann, & Strecker, 1997). Primarily, the present subjunctive, also known as the ‘reportive subjunctive’, signals that the proposition is the object of an utterance report (Fabricius-Hansen & Sæbø, 2004). According to traditional grammars, the past subjunctive may also be used to express irrealis (e.g. Flämig, 1991). However, the past and present subjunctives are often interchangeable.

Since we will not test German, we will not go into detail describing the German subjunctive. What is relevant for the present study is that the German *Konjunktiv*-forms do not encode the type of semantic values encoded by the subjunctive in Portuguese, Romance languages in general, and in some other languages (such as Greek). Therefore, if one thinks that some languages morphologically encode veridicality (e.g. Greek) or both epistemicity and veridicality (e.g. EP), or even a realis/irrealis opposition, the child’s task must be to determine whether the particular language s/he is acquiring encodes these particular features (which may be conceived as

fixing a semantic parameter or mapping morphology with particular features). The distribution of the morphological forms corresponding to the *Konjunktiv* in German is not determined by the same features.

Additionally, it may be important to highlight that the morphological subjunctive is acquired very late in L1 German (Knobloch, 2001), and it is rare in spoken, colloquial registers, where it is substituted by the periphrastic form ‘würde + infinitive’.

METHOD

In this section we present the study, defining the set of participants (bilingual HSs of EP living in Germany) and presenting the method used for testing the participants, which consisted of applying to this group of HSs the same experiment applied by Jesus (2014) to monolingual speakers of EP. We also state our research questions, defining particular predictions. As stated in the ‘Introduction’, we will be generally interested in comparing monolingual and bilingual acquisition, in terms of both the scale and the rate of acquisition, with a particular interest in determining the effects of variables relating to the amount of input in the rate of acquisition.

Participants

The participants are fifty children/adolescents from Portuguese-speaking families with an immigration background, who were all resident in Germany (in the city of Hamburg) at the time of testing. In addition, eight adult HSs living in the same region were also tested. All participants grew up bilingually with Portuguese as their home language and German as the majority language. The young participants (six- to sixteen-year-olds; mean age = 10.1; SD = 2.9) were grouped according to four age intervals: six to seven-year-olds, eight- to nine-year-olds, ten- to twelve-year-olds, and thirteen- to sixteen-year-olds. The two youngest age groups are age-matched with the two oldest monolingual child groups (six–seven years; eight–nine years) tested in Jesus (2014). Additionally, we decided to distinguish between ten- to twelve-year-olds and adolescents older than twelve years of age, since the age span around twelve years of age is shown to be a crucial time for language development (Bylund, 2008; Flores, 2010). Table 3 presents the exact number of children per age and their categorization per age group (with mean age and standard deviation (SD)).

Information concerning children’s biography and patterns of language exposure were collected using a background questionnaire which included questions about the languages spoken at home with parents and siblings or other family members, the parents’ migration background, schooling, and sources of contact with Portuguese (e.g. holidays spent in Portugal). Forty-eight out of fifty children were born in Germany; two participants emigrated from Portugal at the age of two. All children were exposed to

TABLE 3. *Participants*

Age	6	7	8	9	10	11	12	13	14	15	16	Adults
Number of participants	5 10 children	5	2 17 children	15	6 12 children	2	4	2 11 children	3	3	3	8 adults
Age group	6–7 years		8–9 years		10–12 years			13–16 years			19–37 years	
Mean age (SD)	6.5 0.53		8.9 0.32		10.9 0.94			14.6 1.1			26.1 6.1	

Portuguese since birth and to German from the age of three or four, when they started attending a German-speaking kindergarten. When asked about their language preferences, all participants claimed to feel much more comfortable speaking German, but they also stated that they spoke Portuguese in their daily life. All children attended the HL programme for children with Portuguese backgrounds, sponsored by the Portuguese government, two hours per week (where they were recruited) from the first year on (i.e. 1 to 10 years of schooling in the HL; mean time of attendance of the HL course = 5 years; SD = 2.8). The children's families belong to the lower-middle class. All parents have a basic or secondary school level of education; no parent has a university degree.

Despite the fact that all participants grew up bilingually, the amount of daily contact with Portuguese varied across the group depending on the migration background of their parents. All children with two first generation parents (in this case, parents immigrated to Germany as adults and learned German as a second language) spoke mainly Portuguese at home. Their first intensive contact with German occurred when they entered kindergarten at the age of three to four years, being early successive bilinguals with Portuguese as L1 and German as L2. In contrast, those children who had at least one bilingual parent, who grew up and attended school in Germany, used both languages at home. In these cases, German has an important role in family interaction, exclusive communication in Portuguese often being relegated to contact with grandparents or aunts and uncles, or holidays spent in Portugal. These children are simultaneous bilinguals who were exposed to Portuguese and German from birth. It should be noticed that no child has a parent who speaks only German. All the children included in the study had parents who were either first-generation or second-generation immigrants. In addition, children with a Portuguese migration background, but who lived in exclusively German-speaking households, were excluded from this study.

Based on the migration background of their parents, we have a group of twenty-four children growing up in dominant Portuguese households ('G1parents') and a group of twenty-six children from mixed German-Portuguese households ('G2parents'). In addition, these children could also be split according to the presence of older siblings in the family. Table 4 synthesizes the information concerning the families' profiles.

Obviously it is difficult to quantify the exact amount of input each participant receives, but it is reasonable to assume that children who are growing up in Portuguese-German households have significantly less exposure to their HL than children whose HL is the dominant language spoken at home, even though both groups are exposed to Portuguese from birth. In the case of children from Portuguese households, there is a more balanced use of the minority (inside home) and the majority (outside

TABLE 4. *Participants distributed according to their family profile (parents and siblings)*

	G1parents	G2parents	Total
Older siblings: yes	13	13	26
Older siblings: no	12	12	24
Total	25	25	50

home) language, while in the former group the majority language is present inside and outside the family, reducing the amount of exposure to the minority/HL.

In order to complement input measures, the existence of older siblings was also considered in the present study. Many parents who have at least two bilingual children often report that their older child tends to have better proficiency in the family language than their younger children (Barron-Hauwaert, 2011). These subjective reports are confirmed by studies which focus on language use within bilingual families (Hoff, Welsh, Place & Ribot, 2014; Shin, 2002). Having surveyed over 200 Korean heritage families living in the US, Shin (2002) documents an accentuated shift towards the dominant language in language choice from the first-born to the last-born child. It is very common that, even in households where the parents mainly speak the minority language, the main language of communication among siblings is the majority language. Consequently, second-born children tend to acquire the majority language at a younger age than their older brother or sister, and use it more frequently earlier. In this study, twenty-four participants are first-born and twenty-six are second- or third-born children (see Table 4). In two cases both siblings were tested.

Additionally, we tested a group of eight adult heritage speakers of EP, with ages ranging from nineteen to thirty-seven years (mean = 26.1; SD = 6.1). All speakers were born in Germany as second-generation migrants and grew up bilingually speaking Portuguese at home (and in an extracurricular HL course) and German outside. The linguistic profile of this adult group mirrors the profile of the child group with first-generation parents, and allows inferences concerning the steady state of language knowledge attained by HSs with similar linguistic profiles.

Procedure

Given that one of the main goals of this study is to compare the acquisition paths of both heritage speakers and monolinguals, we applied the experiment designed by Jesus (2014), which tested the selection of mood by EP monolinguals.

In this test, children were told a set of four little illustrated stories, which included different test items associated with different episodes in the stories. After hearing each episode in the story, the participants were asked to help



Image. 1. Image from a subjunctive elicitation item.

the interviewer by completing a sentence related to it. The experimenter made sure that, while responding to the task, children were shown an image that exhibited the relevant content for their answer. Despite that fact, the complement proposition was always represented as an open possibility, and never as a fact or an impossible event. This allowed us to control the effect of some semantic notions that may play a role in mood systems (as realis/irrealis or (non-)veridicality). As an example, see the item in (4) and the corresponding image (see [Image 1](#)):

- (4) Previous context (given by the previous items) – A cat and a dog are playing with a ball. The dog threw the ball but the cat could not catch it.

EXPERIMENTER – But the cat did not give up and so he wanted to try again. He said – “Throw it again, this time I will catch the ball.” And the dog answered – “I doubt it!”

Stimulus sentence – *O cão duvidava que ...*
 ‘The dog doubted that ...’

Expected answer – ... *(que) o gato apanhasse a bola.*
 that the cat catch^{SUBJ} the ball
 ‘... (that) the cat would catch the ball.’

The verbs for the matrix clause were chosen in accordance with the semantic notions shown in Table 1. In this case, six test conditions were considered, corresponding to different semantic contexts, and for each condition, two different verbs were selected (see Table 5, where we present the different conditions and the matrix predicates selected for each condition).

Three conditions (A, B, and C in Table 5) elicited subjunctive complement clauses: the condition corresponding to [–epistemic; +veridical] contexts (i.e. complements to non-epistemic implicative verbs); to [–epistemic; –veridical] contexts, i.e. complements to non-epistemic non-implicative verbs; and to [+epistemic; –veridical] contexts, i.e. complements to so-called weak epistemic verbs.

Two conditions elicited indicative complement clauses (conditions E and F in Table 5), both corresponding to [+epistemic; +veridical] contexts. However, these contexts have been split into two conditions, specifically strong epistemic and fiction verbs. Fiction verbs raise the issue of irrealis, which, according to Jesus (2014), may play a role in the distribution of the subjunctive in child speech.

In addition, another condition tested mood choice in the complement of an epistemic DOUBLE MOOD CHOICE verb – *acreditar* ‘believe’ (condition D in Table 5). In such cases, the selection of mood is not exclusively dependent on the matrix verb, but also depends on elements in the discourse context. More precisely, the context is suggestive of whether the relevant entity has a high or a low degree of belief in the truth of the complement proposition. Hence, two items were used in contexts where the indicative was expected and other two items were used in contexts where the subjunctive was expected.

The test contained a total of thirty-eight items (2 training items, 24 test items – 2 for each verb – and 12 fillers). No more items could be included due to young children’s reduced attention span.

The test was applied to each subject in a single session, and all sessions were recorded and transcribed. The interviewer was presented to the participants as a visiting researcher from Portugal who spoke only Portuguese, so that only Portuguese was spoken during data collection. The data were coded according to mood selection, i.e. the child either produced the INDICATIVE or the SUBJUNCTIVE. Additionally, sometimes children used the INFINITIVE. This was coded as a third answer type. Missing responses, answers that revealed a misunderstanding of the story or of the matrix verb or where the child did not produce a complement clause, were coded as ‘NA’ and excluded from the statistical analysis. A total of forty-seven tokens (out of 1,000) were excluded, mostly because the child complemented the sentence with elements other than a complement clause (e.g. only a determiner phrase) or did not provide an

TABLE 5. *Test conditions and matrix verbs*

A. Implicative	B. Non-Implicative	C. Weak Epistemic	D. Epistemic DMC	E. Strong Epistemic	F. Fiction
<i>Subjunctive</i>		<i>Subj. or Ind.</i>		<i>Indicative</i>	
[−epistemic; +veridical]	[−epistemic; −veridical]	[+epistemic; −veridical]	[+epistemic; ±veridical]	[+epistemic; +veridical]	[+epistemic; +veridical]
<i>achar bem</i> ('approve')	<i>querer</i> ('want')	<i>duvidar</i> ('doubt')	<i>acreditar</i> (ind.) (‘believe’)	<i>descobrir</i> ('find out')	<i>sonhar</i> ('dream')
<i>deixar</i> ('let')	<i>mandar</i> ('order')	<i>não acreditar</i> (‘not believe’)	<i>acreditar</i> (subj.) (‘believe’)	<i>prometer</i> ('promise')	<i>finger</i> ('pretend')

answer. Nineteen (out of 47 excluded tokens) revealed a misunderstanding of the matrix verb; especially the verbs *duvidar* ‘to doubt’ and *fingir* ‘to pretend’ (literally, ‘to fake’) were unknown to some children. This low rate of answers excluded due to misunderstanding of the verb (1.9% of all tokens) shows that, in general, lack of knowledge of the verb was not a main obstacle to performing the task.

Research questions and predictions

This study addresses two main research questions. The first one is presented below.

I. Is the acquisition of the distribution of mood in complement clauses by HSs similar to what is described for monolingual speakers?

If it is similar, we can make the following predictions, based on the previous results obtained for EP by Jesus (2014):

- a. HSs will not show problems in using the indicative mood from the age span of six to seven years, showing performance at the level of monolinguals either in the Strong Epistemic (E.) or in the Fiction (F.) conditions.
- b. As for the subjunctive conditions, ceiling or near target-like performance is expected from the age span of six to seven years in the Implicative (A.) and in the Non-implicative (B.) conditions. In the Weak epistemic condition (C.), non-target performance is expected later (at least at eight to nine years), but convergent development is expected in the older groups of HSs (ten to twelve years; thirteen to sixteen years, and adults) in all subjunctive conditions.

If HSs deviate from monolingual children, this divergence may take two different forms:

Differences may be quantitative (only) and affect the rate of acquisition (and eventually ultimate attainment), but not the course of acquisition. This means that HSs will acquire the distribution of the indicative and the subjunctive in the different contexts in the same order as monolingual children, but possibly later. We would therefore expect:

- c. an asymmetry between the acquisition of the indicative and the subjunctive mood, with HSs first achieving convergent performance in indicative contexts (although better performance may be expected earlier with Strong Epistemic verbs rather than with Fiction verbs).
- d. in the subjunctive conditions, better performance will be achieved in conditions corresponding to [–epistemic] contexts (A. Implicative and B. Non-implicative) rather than in the Weak Epistemic condition (C.),

with even better performance expected in the case of the Non-implicative (B.).

As opposed to this, differences may also be qualitative, i.e. the HL child may show an acquisition path that completely diverges from monolinguals. This may be the case if:

- e. HSs do not show the indicative–subjunctive asymmetry found in monolinguals, or if HSs do not demonstrate a preference for the subjunctive in non-epistemic contexts and for the indicative in epistemic ones.

The second research question we want to answer concerns the relationship between the amount of input and acquisition:

- II. Is the rate of acquisition predicted by the amount of input received by the children?

In this case, child HSs will acquire the distribution of mood later than monolingual children, but more importantly, children with less input at home (with second-generation parents) will show target-like use (especially) of the subjunctive later than children with more input at home. Birth order may further influence the speed of acquisition, with first-born children showing higher rates of target-like answers than children with older siblings.

If this is confirmed, we expect that:

- f. children with first-generation parents will attain target-like (or near target-like) performance earlier than children with second-generation parents;
- g. first-born children will attain target-like (or near target-like) performance earlier than non-first-born children.

RESULTS

We start by descriptively presenting our results in terms of accuracy rates by group and by condition (see Table 6). Only after this general description will we present the results of the statistical analysis.

Table 6 shows a general convergence between HSs and the monolinguals' performance, as analyzed by Jesus (2014), to the extent that both monolingual and HL children were more successful earlier in indicative than in subjunctive contexts. Also, in a way similar to the monolinguals, in the indicative conditions all child HSs showed higher rates of accuracy with strong epistemic verbs (Condition E.) than in contexts with fiction verbs (Condition F.), and higher rates of target subjunctive in [–epistemic]

TABLE 6. *Mood selection – heritage speakers: results by age and by condition (accuracy rate %)*

	A. Implicative	B. Non-Implicative	C. Weak Epistemic	D. Epistemic DMC	E. Strong Epistemic	F. Fiction
	<i>Subjunctive</i>			<i>Subj. or Ind.</i>		<i>Indicative</i>
	[–epistemic; +veridical]	[–epistemic; –veridical]	[+epistemic; –veridical]	[+epistemic; ±veridical]	[+epistemic; +veridical]	[+epistemic; +veridical]
6–7 years	2.5	17.5	5.0	47.5	90.0	80.0
8–9 years	22.2	31.9	9.7	55.6	94.4	87.5
10–12 years	40.9	38.6	27.3	50.0	100	88.6
13–16 years	75.0	95.5	52.3	61.4	97.7	79.5
adult HSs	96.8	100	95.0	63.3	89.7	84.4

contexts (A. Implicative and B. Non-implicative), earlier than in [+epistemic; –veridical] contexts (C. Weak Epistemic).

However, and despite what seems a sign of general convergence in terms of the acquisition path, HSs showed delayed development when compared with monolingual children. In the case of the indicative conditions, convergence with monolinguals was already found in the group of six- to seven-year-olds. However, the accuracy rate was not as high as in the case of monolingual children of the same age. In the case of the subjunctive conditions, the results were more striking: HSs converged with the target grammar only in the thirteen- to sixteen-year-old age span, with all younger groups showing performance below 50%; in addition, the accuracy rates achieved by the HSs in the thirteen-to sixteen-year-old group were only comparable to the accuracy rates of monolingual children in the age span of six to seven years old. Adult HSs showed high accuracy rates (with the exception of condition D. – DMC contexts, exactly as in the case of monolingual adults), although generally performing at a slightly lower level, especially in the indicative conditions – we will come back to this.

Therefore, this first analysis of the results showed that data were generally consistent with predictions c. and d. (we will come back to this when discussing the statistical results), but not with predictions a. and b. This means that child HSs generally follow the same acquisition path as monolingual children and, given the results obtained by adult HSs, ultimately converge with the target grammar, but their acquisition is generally delayed, i.e. it does not happen within the same age span as in the case of monolingual speakers.

Complementing the results shown in Table 6, Figures 1 and 2 (provided as supplementary materials; online <www.journals.cambridge.org/JCL>) identified for each set of conditions what children actually produced when they did not give the target answer, allowing an evaluation of whether an avoidance of the subjunctive necessarily leads to the use of the indicative. In fact, in addition to the indicative or the subjunctive mood, some children produced non-finite structures. The results indicate that, in conditions requiring an indicative complement, the youngest children had already acquired finiteness and produced the indicative in a target-like manner in more than 80% of all contexts.

Nevertheless, with fiction verbs, HSs sometimes selected the subjunctive mood, a tendency which was more salient in the case of the oldest children and the adults (22.3% and 15.6%, respectively).

Different results were obtained in the three conditions requiring the subjunctive (see Figure 2 in the online supplementary materials). In this condition, all child groups resorted primarily to the indicative mood when they did not produce the subjunctive. Additionally, there was also, however, a much more salient use of the infinitive in these contexts. The

youngest child group produced between 15.8% (Weak epistemic condition) and 19.4% (Non-implicative condition) of non-finite forms. Only the adult HSs never used infinitives in finite contexts.

The second research question, which is central to the goals of this paper, concerns the effects of the amount of input in bilingual (HL) acquisition. In order to answer this question, we performed a statistical analysis, which allowed us to test not only the effect of age at testing but also the effect of factors relating to the amount of input in the acquisition of mood choice in complement clauses. We thus performed a Generalized Linear Mixed Model (GLMM), using Rbrul, a text-based interface to existing functions in the R environment (Johnson, 2009). Statistical results are reported in the log-odds scale (the odds is the ratio of the probability of an event happening to that of it not happening; the log-odds is the logarithm of the odds) and degree of significance (p) of predictor variables.

Two complementary analyses were performed. In a first analysis, focused on the overall performance of the children and its correlation with age at testing and input factors, we tested the fixed effects CONDITION, AGE GROUPS, and the two factors which we take as indirect measures of quantity of input, PARENTS (first- vs. second-generation parents) and SIBLINGS (presence or absence of older siblings), together with SUBJECT as a random factor. In a second analysis, aimed at determining developmental effects in particular conditions, especially those conditions identified as problematic, according to the description of raw performance data, we performed GLMM per condition and evaluated the effects of AGE GROUPS, PARENTS, and SIBLINGS, also maintaining SUBJECT as a random factor.

The first analysis revealed significant effects of all predictor variables: CONDITION ($p < .001$), AGE ($p < .001$), SIBLINGS ($p = 0.018$), and PARENTS ($p = 0.019$). Table 7 indicates the log-odds values and overall accuracy rate for each selected variable.

Concerning the variable CONDITION, the results revealed that the rate of accuracy was considerably higher in the indicative than in the subjunctive contexts, the strong epistemic condition being the most unproblematic one, with a positive log-odds value of 3.261, followed by the fiction verb condition, with a positive log-odds value of 1.626. This is in agreement with prediction c. In contrast, the subjunctive contexts and the context of DMC showed lower rates of accuracy and negative log-odds. However, the DMC included items in which the indicative was expected along with items in which the subjunctive was expected. In order to evaluate our hypotheses, we must focus only on the conditions in which the subjunctive was mandatory. In this case, a difference can be established between the [–epistemic] contexts (condition A. Implicative and condition B. Non-implicative) and the [+epistemic; –veridical context] condition (condition C. Weak Epistemic). In the former case, the subjunctive is

TABLE 7. *Predictor variables condition, age groups, siblings, and parents: log-odds and overall accuracy rate (in %)*

Variable <i>p</i> value	Condition (<i>p</i> < .001)	Age group (<i>p</i> < .001)	Siblings (<i>p</i> = .018)	Parents (<i>p</i> = .019)
overall accuracy	Strong epistemic	13–16 years:	first-born:	1 st generation:
log-odds	97.4	77.2	63.2	62.3
	Fiction	10–12 years:	not first-born:	2 nd generation:
overall accuracy	3.261	1.186	0.245	0.237
log-odds	88.9	58.2	53.5	54.4
	Epistemic DMC	8–9 years:	–0.245	–0.237
overall accuracy	55.1	53.6		
log-odds	–0.461	–0.438		
	Non implicative	6–7 years:		
overall accuracy	47.6	44.1		
log-odds	–0.850	–0.813		
	Implicative			
overall accuracy	36.8			
log-odds	–1.399			
	Weak epistemic			
overall accuracy	22.6			
log-odds	–2.177			

justified by the [–epistemic] feature; in the latter case, the subjunctive is justified by the [–veridical] feature. The most problematic condition was indeed the weak epistemic context, with negative log-odds (–2.177). In addition, condition B. Non-implicative attained better results than condition A. Implicative, in agreement with prediction d.

With respect to the variable AGE GROUP, the results confirmed increasing overall accuracy with increasing age, mirrored in the log-odds values, which were negative in the six- to seven-year-old age group (–0.813), increased in the eight- to nine-year-old group (–0.438), and achieved 0.064 in the ten- to twelve-year-olds. The thirteen- to sixteen-year-old group presented the highest accuracy value and the highest log-odds (1.186). We will return to the effect of AGE when analyzing its effects in each condition, particularly the subjunctive conditions.

Concerning the variables associated with the quantity of input, which are at the core of this study, the results showed higher rates of accuracy in children who were first-born (63.2% of overall accuracy and positive log-odds of 0.245), compared to children who had older siblings (53.5% of overall accuracy and a negative log-odds of –0.245). Also the group of children who had two first-generation parents differed from the group with at least one second-generation parent (62.3% overall accuracy and positive log-odds of 0.237, against 54.4% and negative log-odds of –0.237, respectively). This is consistent with predictions f. and g. To the extent

that having first- or second-generation immigration parents or having older siblings is reflected in the amount of input received, our results confirm that less input results in lower accuracy rates of mood choice in complement clauses.

In order to specifically evaluate the effects of AGE AT TESTING and the amount of INPUT per condition, we ran additional separate GLMM models for each condition. As expected, concerning the indicative conditions, no significant predictor variables were selected, either for the fiction verbs or for the strong epistemic contexts. This means that the rate of accurate indicatives is not predicted by age at testing or by the quantity of input.

In contrast, age at testing and the quantity of input are particularly relevant in the conditions corresponding to subjunctive contexts. The following variables were selected as significant predictors for each condition:

- Implicative: PARTICIPANT [random] and AGE GROUP ($5.41e-07$) + PARENTS (0.0262)
- Non implicative: PARTICIPANT [random] and AGE GROUP ($2.38e-07$) + PARENTS (0.036)
- Weak epistemics: PARTICIPANT [random] and AGE GROUP ($2.38e-07$) + SIBLINGS (0.0135)

Note that the variable AGE GROUP was selected as a significant predictor in all three subjunctive conditions, the variable PARENTS in the implicative and non-implicative conditions, and SIBLINGS in the weak epistemic context.

In order to allow an exploration of the data in more detail, [Table 8](#) presents the accuracy rates in the three subjunctive conditions, organized by age group and parents' profile.

Several observations have to be made regarding these results. The first concerns the low production of subjunctives, independently of the parents' profile, in the youngest age group ($0-20.8\%$). The second concerns the course of development, organized according to age and parents' profile, in the immediately following age groups: children with two first-generation parents revealed a greater increase in accuracy at the eight to nine years and the ten to twelve years point compared to children with second-generation parents, who showed a clear delay. Children whose parents (or at least one of them) were second-generation immigrants only demonstrated a bigger increase in accuracy rates after age twelve.

Even though we are now looking only at raw data representing the percentage of correct answers, we can see that the group of children with first-generation parents showed a relevant increase of target-like production from the first to the second age span in all three conditions. This tendency was not mirrored in the group of children from second-generation households, who revealed a smaller increase of target-like production of subjunctives from the first to the

TABLE 8. Accuracy rate in the subjunctive conditions per parent profile and age group (in %)

	Implicative		Non-Implicative		Weak Epistemic	
	[−epistemic; +veridical]		[−epistemic; −veridical]		[+epistemic; −veridical]	
	<i>1st generation parents</i>	<i>2nd generation parents</i>	<i>1st generation parents</i>	<i>2nd generation parents</i>	<i>1st generation parents</i>	<i>2nd generation parents</i>
6–7 years	0	4.2	12.5	20.8	0	8.3
8–9 years	35	6.2	47.5	12.5	15	3.1
10–12 years	62.5	28.6	62.5	25	37.5	21.4
13–16 years	78.13	70.83	96.88	91.67	56.25	50

second age span in all three conditions. In the group of children from second-generation households, the strongest acquisition effect occurred only from the age group ten to twelve years to the age group thirteen to sixteen years, i.e. later than in the other child group. However, in the older age span (thirteen to sixteen years), the children from second-generation households reached accuracy rates similar to children from first-generation households. This suggests that both child groups eventually reach very similar proficiency at older ages, even though the amount of input which they are exposed to influenced the rate of acquisition.

DISCUSSION AND CONCLUSIONS

The main goal of this study was to describe the acquisition of mood selection in complement clauses by HSs of EP, and to compare this process to what is described for monolingual speakers. Answering the first research question, the results show that HL children acquired mood distinctions in complement clauses following an acquisition path similar to the one followed by monolingual EP children. For both types of speakers, the use of the indicative mood, required in [+epistemic; +veridical] contexts, did not pose great difficulties in any age span. Like monolingual EP children, child HSs of EP preferred the use of the indicative in epistemic veridical contexts, both with strong epistemic and with fiction verbs. In the same conditions, the youngest HL children (aged six to seven) already preferred the indicative (80% accurate answers with fiction verbs and 90% with strong epistemic verbs). However, an interesting particularity was observed in the indicative contexts with fiction verbs. Some child HSs occasionally employed the subjunctive mood in these conditions. This tendency was observed in almost all age groups, but was more salient in the oldest age span (age thirteen to sixteen: 12.5–33.3% of subjunctives with fiction verbs). Interestingly, this performance was equally found by Jesus (2014) for monolingual children, but at younger ages. This performance may signal that the acquisition of the relevant semantic properties that regulate mood choice in EP complement clauses goes through a process in which non adult-like mood choice triggers play a role. In this case, it might be that children explore the possibility that mood contrasts encode the irrealis/realis opposition, which is not relevant for mood choice in complement clauses in Portuguese. If it is true that irrealis is also associated with some subjunctive contexts in German, cross-linguistic influence could explain the higher number of subjunctive uses in irrealis contexts in child HSs children than that obtained in the study involving EP monolingual children. Since, in the case of the HSs, this performance was identified in older ages, it appears that this population did not overcome this transitory period. This observation was reinforced by the

results of the eight adult HSs, who also sporadically produced subjunctives with fiction verbs and with the (prospective) epistemic verb *to promise* (c. 8.3%), showing some kind of fossilization. Thus, a transitional period, observed in monolingual acquisition, may be reinforced by the presence of a similar constraint in the majority language.

The subjunctive conditions give further revealing insights into the development of a HL. Similarly to what was observed for monolingual EP children by Jesus (2014), heritage bilinguals overall performed worse in subjunctive than in indicative contexts, corroborating the prediction that, qualitatively, both groups show identical mood asymmetries. However, contrary to monolingual children, heritage bilinguals still produced high rates of indicatives in the [–epistemic] subjunctive contexts even after the age of eight years, signalling that the acquisition of the subjunctive in complement clauses starts much later in this population and may continue until adolescence. This observation confirms that HL and monolingual children show a similar acquisition path, to the extent that the order of acquisition of the different subjunctive contexts was similar, but they demonstrated quantitative differences that revealed protracted development of the HL. In the case of HL acquisition, there was also a higher rate of non-adult-like infinitives compared to the indicative contexts. As in monolingual acquisition, this may signal the place of the infinitive in the first steps of a semantic opposition concerning mood (Hyams, 2001), or a difficulty with the subjunctive morphology, with the infinitive occurring here as a suppletive form.

The fact that the differences between monolingual and HL children were mainly quantitative, i.e. differences in the rate of acquisition, rules out the prediction that direct transfer from German influences the acquisition of the distribution of mood. The bilingual children acquired the semantic constraints that encode mood selection in EP complement clauses and, except for a possible reinforcement effect concerning subjunctive use associated with irrealis contexts, they did not show deviations that could be explained by transfer from German.

The older bilingual children (older than twelve years) and the adult HSs produced high rates of subjunctives in the [–epistemic] contexts (condition A. Implicative and Condition B. Non-implicative). We can thus conclude that this population acquires the semantic feature that triggers the selection of the subjunctive in [–epistemic] contexts and uses it in the appropriate contexts, although later than monolinguals. The [+epistemic; –veridical] contexts, however, remained problematic even for the oldest children. This signals more problems in choosing the subjunctive in contexts that are epistemic and non-veridical at the same time (condition C. Weak Epistemic). Again, these problems seem to be inherent to the development of mood in EP, since they are also observed in monolingual

children, even though at younger ages. The fact that the [+epistemic; –veridical] context is the most problematic one, also in the HSs group, also confirms that in HL acquisition epistemicity precedes veridicality. This may indicate that late-acquired properties remain a locus of vulnerability in HL acquisition, most probably because reduced input after the optimal period hinders full stabilization of the target property (Meisel, 2013). This is compatible with the idea that the linguistic domains where monolinguals display more variability are those where HSs show the lowest results in testing situations (see discussion in Rinke & Flores, 2014, and van Osch, Aalberse, Hulk & Sleeman, *in press*).

The second research question focused on the role of the amount of input. The regression analysis showed significant effects of age at testing, parental input, and birth order in the use of the subjunctive. When analyzing the percentage correct scores achieved by the different groups, it is noticeable that in the youngest age span (six to eight years) both groups performed similarly, i.e. all children, independently of family structure, showed difficulties in producing the subjunctive. Also in the oldest age span (thirteen to sixteen years) both groups revealed a similar performance, in this case showing high rates of accuracy in the implicative (78.13–70.83%), and even higher in the non-implicative contexts (96.88–91.67%), and an accuracy rate of 56.25–50% in the weak epistemic contexts. These results indicate that, up to age eight, HL children have still not acquired the subjunctive, regardless of the amount of contact with EP at home, but the amount of exposure seems to matter after this age for this particular structure.

In general, children from first-generation households achieved higher rates of correct answers earlier than children from mixed households, showing that the amount of exposure to the HL influenced the speed of language acquisition in this particular domain. It seems that children with less input need more exposure over time in order to acquire the semantic values associated with the subjunctive in complement clauses. This observation is in line with findings from other studies, which attribute acquisition delays in bilingual language acquisition to reduced language exposure (Austin, 2009; Blom, 2010; Gathercole, 2007; Gathercole & Thomas, 2009; Hoff *et al.*, 2012; Rodina & Westergaard, 2015; Schlyter, 1993; Suchtelen, 2014; Thomas, Williams, Jones, Davies & Binks, 2014; Unsworth, 2014; Unsworth *et al.*, 2014). However, the amount of accumulated input that child HSs in mixed households get up until sixteen years of age seems to be sufficient to ensure acquisition of the relevant properties. Furthermore, as suggested by several authors (Hoff *et al.*, 2014; Shin, 2002), birth order also appears to have an effect on the acquisition path, since first-born children present higher rates of accuracy than second- or third-born children.

Summing up, we find that the amount of parental input (even if with similar age of onset) plays a crucial role in the acquisition of a minority language. Furthermore, our results support the idea that reduced input leads to delayed acquisition of late-acquired properties, since we only found protracted development in the case of the subjunctive, but not the indicative. In fact, in monolingual EP, target knowledge of the subjunctive needs more time to stabilize than knowledge of the indicative. In HL development, these late-stabilized properties are precisely the most affected by reduced input. In the case of these structures, it is probably particularly relevant that this exposure does not decrease before the moment in which the relevant acquisition is expected to occur.

SUPPLEMENTARY MATERIALS

For supplementary materials for this paper, please visit <www.journals.cambridge.org/JCL>.

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