Age Effects in the Heritage Language Acquisition of Differential Object Marking in Spanish: Late Childhood to Adulthood

Abstract:	• Aims/objectives/purpose/research questions: The present study evaluated child and adult heritage speakers' (HS) knowledge of differential object marking (DOM) by addressing the roles of age, proficiency, and frequency of use, and to measure differences between production and receptive knowledge. • Design/methodology/approach: 127 participants completed a sentence completion task (SCT) and a morphology selection task (MST) targeting DOM with animate and specific direct objects. In addition to a group of Spanish-dominant bilinguals, fifth grade, seventh/eighth grade, and adult HS groups completed this experiment. • Data and analysis: All responses were coded for production/selection of DOM and submitted to a generalized linear mixed methods model, which included effects for group, task, proficiency, and frequency of use of Spanish. • Findings and conclusions: HS' DOM production and selection of DOM increased across age groups. Proficiency modulated differences between HS of all ages and participants were more likely to select DOM on the MST than to produce it on the SCT. However, all HS produced and selected DOM at least one time, arguing against incomplete acquisition. • Originality: this study is the first to plot the course of DOM development across late childhood and into adulthood in Spanish HS that incorporates both a production task and a receptive measure to explore HS' holistic linguistic systems.

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	• Significance/implications: These findings show that there are factors that can account for variability in the production and selection of DOM at the group, individual, and within-speaker levels. This has implications for theories of acquisition: gradient knowledge argues against incomplete acquisition of DOM, but the increase in knowledge across age groups argues against feature reassembly.

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1. Introduction

The acquisition of heritage languages (HL) has been the topic of extensive research, frequently concentrating on Spanish speakers in the United States (see Potowski, 2018). Heritage speakers (HS) are native speakers of a particular language in a context where a different language has more hegemonic status (Romaine, 2004). HS are highly heterogeneous because there are myriad factors that influence their development, and exploring the acquisition of HLs is crucial for a better and more complete understanding of first language (L1) acquisition and bilingualism.

Traditionally, scholars have aspired to distinguish between incomplete acquisition of grammatical structures (e.g., Montrul, 2008), referring to fossilization development, and attrition (e.g., Hicks & Domínguez, 2020; Polinsky, 2011), referring to loss. These theories imply differences between HS and other groups of native speakers, and differ in their directionality: incomplete acquisition implies an increase in knowledge until a certain time period in development, while attrition implies a decrease. More recently, Putnam and Sánchez (2013) advanced a process-oriented framework that conceives of patterns of exposure as essential to HL acquisition and maintenance. This perspective is oriented towards individual HS' experiences with the HL. The theories of directionality (incomplete acquisition and attrition) and of individual variability (Putnam & Sánchez, 2013) are influential in understanding HL acquisition more generally, because they provide predictions at different levels (between-groups, within-groups, and within a single speaker).

All of these levels of variability have been explored in research on HS' acquisition of differential object marking (DOM) in Spanish. Only one study (Montrul & Sánchez-Walker, 2013) has compared HS children to adults, and only one (Guijarro-Fuentes et al., 2017) has compared

bilingual children's productive knowledge to their underlying syntactic competence. The present study compares HS' knowledge of DOM across the adolescent years into adulthood using both productive and receptive measures to provide a more holistic perspective of the developmental path of this structure. This study therefore has implications for our understanding of theories of HL acquisition by considering the role of age in development.

2. The Role of Age in Bilingual Development

Montrul (2013, pp. 370-371) describes that distinguishing between incomplete acquisition and attrition is a methodological challenge, and that "Although longitudinal studies are ideal to tease apart these two possibilities, another way to address these questions is by comparing child and adult heritage speakers." On one hand, researchers (e.g., Montrul, 2008) have traditionally argued that incomplete acquisition occurs when older children and adults exhibit higher rates of production or receptive knowledge of a particular structure than younger children, yet the oldest HS do not show the same levels of use of this structure as other populations of native speakers. However, if older participants show decreases in their production or receptive knowledge compared to younger participants, this points towards attrition across the lifespan. Although these theories make testable predictions for testing differences between HS and other groups, the notion of incompleteness has potentially pejorative consequences. Moreover, these theories do not evaluate the factors that can explain differences between individual HS or within a single speaker's grammar (e.g., Bayram et al., 2019; Kupisch & Rothman, 2018; Otheguy, 2019).

In contrast, Putnam and Sánchez (2013) argue that incomplete acquisition and attrition do not conceptualize the process through which HS' grammatical knowledge shifts over time. Their approach to HL acquisition is based upon Lardiere's (2009) Feature Reassembly Hypothesis. Putnam et al. (2019, p. 19) define features as "Indices on lexical items and larger syntactic objects

that allow generated structures to be interpreted at external interfaces." Following these researchers, HS must receive consistent exposure to their HL to process these features and map them onto (or interpret them on) lexical items. They argue that infrequent processing of these features will lead to their reassembly to resemble those of the dominant language. Putnam and Sánchez (2013) claim that reassembly begins in production but may not affect underlying competence until later in the restructuring process. Therefore, this model proposes that HS frequently show asymmetrical knowledge between production and comprehension because they can retain sensitivity to syntactic categories even when exhibiting variability in production of a given (morpho)syntactic feature. Evidence of asymmetries between production and receptive knowledge is well documented in HL research (Author, xxxx; Giancaspro & Sánchez, 2021; Guijarro-Fuentes et al., 2017; Perez-Cortes, 2016; Sherkina-Lieber, 2015).

The advantage of this hypothesis is that it predicts differences between individual HS based upon their patterns of exposure, which these researchers claim is relevant for accounting for the processes through which HS engage in the reassembly of features of the HL. However, this model implies that these HS have initially acquired such features in the first place. Consequently, although individual patterns of exposure and proficiency level, which has been interpreted as a proxy for cumulative exposure (e.g., Giancaspro & Sánchez, 2021; López Otero, 2022), can capture individual differences between HS, this theory does not explicitly discuss how younger HS acquire HL features over time, where in contrast incomplete acquisition calls for evaluating group-level differences between age ranges.

Following Putnam and Sánchez's (2013) model, the increase of English exposure around the onset of schooling could lead to the progressive reassembly of HL features in older children; therefore, age could represent a proxy to the degree of exposure to English and subsequent

reassembly of the HL grammar. There is some evidence that HS restructure their grammatical knowledge in late childhood (e.g., Goebel-Mahrle & Shin, 2020). However, other studies reveal that HS' command of inflectional morphology develops with age despite a drop in exposure to the after the onset of schooling (Corbet & Domínguez, 2020; Cuza & Miller, 2015; Martinez-Nieto & Restrepo, 2022).

To summarize, incomplete acquisition and attrition make predictions regarding the directionality of group-level differences between HS and other native speakers, while Putnam and Sánchez (2013) concentrate on the process of HL acquisition that can vary between and within individual HS based upon patterns of use and exposure. They predict that decreases in activation will result in the reassembly of HL features, which can affect production before underlying syntactic knowledge. The study of DOM has been tied to patterns of exposure and evidence shows it is highly variable in HS populations (Montrul & Bowles, 2009; Montrul & Sánchez-Walker, 2013), which makes it a natural testing ground for the theories laid out above and their intersection with age. The following section concentrates on this structure and its acquisition by monolingual and bilingual speakers.

3. Differential Object Marking in Spanish

Spanish is among approximately 300 languages that feature a DOM system whereby some animate objects require special case marking (Bossong, 1991). In Spanish, the preposition *a* that marks dative case with all indirect objects is also obligatory to mark accusative case with animate and specific direct objects (Fábregas, 2013; Torrego, 1998; Zagona, 2002).[1] In contrast, accusative objects that are not animate nor specific do not require DOM. In such instances, Torrego (1998)

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[1] There are multiple other semantic considerations in DOM, including verbal telicity, subject agentivity, and the animacy of animals (see citations above) that are not relevant to the present project, and therefore will not be discussed due to space limitations.

argues that Spanish has inherent case that is marked on animate and specific objects through the D-feature. Although the morphological realization of this structure is not highly salient (see Bhatt et al., 2015 or Sagarra et al., 2019 concerning saliency and DOM in HL acquisition), it has important implications for meaning: DOM facilitates the freer word order of Spanish when compared to languages such as English, as it enables disambiguating between subject and object. Following Torrego (1998), while both English and Spanish have structural case, DOM is an instance of inherent case that is marked through the D-feature in *spec,vP*. For instance, in sentence (1), there is no dative *a* preposition, which implies that Roberta is the subject of this VS sentence. However, in (2), there is a null subject, and Roberta is the direct object, as indicated by the *a* dative case marker.

> (1) Escucha Roberta.
> *Listen-3PS Roberta.*
> Roberta listens.

> (2) Escucha a Roberta.
> *Ø listen-3PS to Roberta.*
> She listens to Roberta.

DOM is an ideal structure to study within a feature-oriented framework such as the one proposed by Putnam and Sánchez (2013), as Torrego (1998) argues that there is an interpretable D-feature in *spec,vP* that triggers overt movement of [+animate] and [+specific] objects from base position in the VP. English does not have a DOM or inherent case system, so Putnam and Sánchez (2013) would predict that English-dominant HS of Spanish could reassemble their case marking system to obviate the D-feature with animate and specific direct objects, beginning in production and extending to underlying knowledge.

3.1. Early Acquisition of DOM

There are two case studies that warrant attention in the monolingual acquisition of DOM. Firstly, Rodríguez-Mondoñedo (2008) evaluated four children's development of DOM longitudinally, and found that by age three, participants produced the *a* marker with 98% accuracy. Although this indicates that monolingual children acquire DOM early, the child with the greatest rates of DOM omission was bilingual in Spanish and Catalan. In contrast, Ticio (2015) found greater variability among monolingual children as well as age-matched bilinguals acquiring English and Spanish as their two first languages. Since English and Spanish diverge in their object marking systems when compared to Spanish and Catalan that have highly-similar DOM systems (Irimia & Pineda, 2022), it is not surprising that the researcher documented far greater omission rates in seven bilingual children when compared to three monolinguals. Through age 3;6, Ticio documented omission of DOM of up to 75% among bilinguals, although the omission rate among monolinguals was 30%, considerably higher than in Rodríguez-Mondoñedo's (2008) study. These results suggest that English-dominant HS of Spanish have a protracted developmental process of DOM, whereby their rates differ quantitatively from monolinguals or bilinguals of the same age.

3.2. Bilingual Acquisition of DOM

3.2.1. HS Children. Previous studies on bilingual children have shown that these individuals indeed experience a protracted development of this structure. Beyond the young age ranges studied in Ticio (2015), Cuza et al. (2021) evaluated DOM production in children between ages 6;7 and 11;2 in two production. The researchers found that there was no effect for age on DOM production, and that HS produced the *a* preposition with animate objects in traditional syntactic contexts more than in clitic leftist dislocation. Secondly, in a set of studies, Guijarro-Fuentes and Marinis (2011) and Guijarro-Fuentes et al. (2017) evaluated English-Spanish bilingual children between ages ten and fourteen in their knowledge of different semantic entailments of

DOM.[2] Spanish HS produced fewer instances of DOM than monolingual peers in animate and specific contexts, but patterned with the monolinguals on acceptability judgments. This study supports the finding that HS have asymmetrical knowledge of (morpho)syntactic structures such as DOM, whereby variability in production may not match underlying syntactic competence. However, there was no effect of age or language dominance, but rather proficiency, on variability in production of DOM.

Of greatest relevance to the present study is Montrul and Sánchez-Walker's (2013) experiment, in which the researchers compared child and adult HS' production of DOM across two tasks. In this study, the researchers documented a wide range of variability ranging from 0% to 100% production of DOM in the expected contexts. Adult HS produced more DOM than children between ages six and seventeen, and patterns of current exposure to Spanish modulated HS' production tendencies. These results show that children continue to acquire this structure into adulthood, and that exposure shapes HS' knowledge. Nevertheless, the children in this study comprised a single group, which prevents the facile identification of points in adolescence where HS may have experienced considerable growth in their knowledge of DOM. Furthermore, there was no receptive task with which to assess growth of syntactic knowledge, which presents an opportunity for future research.

3.2.2. Research with Adult HS. Research on DOM with adult HS has been consistent with children, whereby findings have shown that these bilinguals exhibit considerable variability in production. Early research showed that HS' productive and receptive knowledge of DOM varied as a function of proficiency, but that those participants with high proficiency produced this

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[2] Since the present study concentrates on "core" aspects of DOM in specific and animate accusative objects, only this context will be discussed here.

structure nearly categorically (Montrul, 2004; Montrul & Bowles, 2009). Furthermore, in Montrul

and Bowles (2009), participants often overaccepted nongrammatical instances of DOM omission

and grammatical clitic leftist dislocation, which led the researchers to claim that HS experience

incomplete acquisition of this structure. More recently, Montrul et al. (2015) found that Spanish

HS were more variable in their acceptability judgment of DOM when compared to Romanian and

Hindi HS, which the researchers attributed to the fact that the dative preposition *a* is less

perceptually salient than its equivalents in the other languages. In sum, researchers have claimed

that HS experience incomplete acquisition of DOM due to its low perceptual salience and as a

function of proficiency level in Spanish.

Most recently, Hur (2020) conducted a study that addressed differences beyond the group

level in HS adults' command of this structure. This researcher found that HS' self-ratings of the

frequency of individual verbs modulated how often they produced DOM. In particular, participants

with intermediate proficiency were susceptible to the effects of lexical frequency, while those with

high proficiency were not. This study is consistent with all of those that have examined the role of

proficiency on HS' knowledge of this structure (Guijarro-Fuentes & Marinis, 2011; Montrul, 2004;

Montrul & Bowles, 2004), but it goes beyond comparisons of HS to other groups of speakers by

concentrating on within-speaker variability.

4. The Experiment

There is yet to be a single study that has evaluated multiple age groups using both a

production task and a receptive measure. Since older school-aged children represent age groups

that are essential for distinguishing between theories of HL acquisition, comparing pre-adolescent

and adolescent children to adults who are HS of Spanish has critical theoretical implications.

Furthermore, such research can contribute to a limited body of work that concentrates on

differences between and within HS' grammatical systems, by addressing the roles of proficiency

and frequency of use (between speakers) and production-comprehension asymmetries (within-

speaker). Therefore, the present study evaluated three levels of variability (between-groups,

between-speakers, and within-speaker) through three research questions (RQs):

1. Do HS produce and select more instances of DOM between adolescence and adulthood with

   animate and specific direct objects?

As stated previously, the role of age in HL acquisition has been difficult to pinpoint, but the

available evidence suggests that HS continue to master DOM into adulthood (Montrul & Sánchez-

Walker, 2013). Since there was no evidence of age effects in the children studied between ages

6;7 and 11;2 in Cuza et al. (2021) nor any evidence of cross-sectional attrition of DOM in the

studies conducted thus far on children and adult bilinguals. It is therefore predictable that HS would

show increases in production and selection of DOM with animate and specific direct objects across

three age ranges (fifth grade, seventh/eighth grade, and adults). This would locate the adolescent

years as a period of considerable HL growth and would argue against the attrition of the D-feature

responsible for DOM in Spanish.

2. Do proficiency and frequency of use of Spanish influence differences in DOM production and

   selection between HS participants with animate and specific direct objects?

Previous research shows that frequency of use of Spanish affects the production of DOM (Montrul

& Sánchez-Walker, 2013) and that morphosyntactic proficiency modulates production and

acceptability judgment of DOM (Guijarro-Fuentes et al., 2017; Montrul, 2004; Montrul & Bowles,

2009). Furthermore, Putnam and Sánchez (2013) argue that lower frequency of use of the HL will

result in the reassembly of functional features such as the D-feature that results in DOM that is not

present in English. Therefore, it was predicted that HS who have higher proficiency in Spanish

and who report using it more frequently would have higher rates of DOM production and selection.

3. Do HS show asymmetries between production and selection of DOM with animate and specific

    direct objects?

Previous research on adult HS' inflectional systems suggests that these speakers possess finer-

tuned underlying syntactic knowledge when compared to variability in production (Author, xxxx;

Giancaspro & Sánchez, 2021; Perez-Cortes, 2016; Sherkina-Lieber, 2015), which aligns with the

predictions of Putnam and Sánchez's (2013) account of feature reassembly. Furthermore, Guijarro-

Fuentes et al. (2017) showed that pre-adolescent and adolescent HS patterned more similarly to

monolinguals on a receptive acceptability judgment task when compared to production. Therefore,

it was predicted that HS in this experiment would select DOM with animate and specific direct

objects on a multiple-choice task more than they would produce this structure.

4.1. Participants

127 bilinguals participated in the present experiment in four groups: Spanish-dominant

bilinguals (SDB; n = 18), HS adults (HSA; n = 34), HS in seventh and eighth grade (HS7/8, n =

34; ages 12-14), and HS in fifth grade (n = 41; ages 10-12). The SDB were raised in seven Spanish-

speaking countries and had moved to the mainland United States no earlier than age twelve. These

participants were working as graduate students or language teachers in the region of the United

States where they study was conducted. This group represented the bilingual input to which HS

may receive exposure, which reduces the confound between the innovations in HS' grammars and

variability that may be present in their input (Rothman et al., 2022). The HSA were undergraduate

and graduate students at a large research university and working professionals in the surrounding

community. Finally, the HS7/8 and HS5 were students at two schools in central New Jersey that

were matched for socioeconomic status and demographics. The HS7/8 and HS5 were primarily

sequential bilinguals of Mexican descent who reported Spanish as the primary language at home.[3]

Table 1 summarizes each group's characteristics: frequency of use of Spanish, proficiency

on the Bilingual English-Spanish Assessment (BESA; Peña et al., 2014), and number of

monolingual Spanish-speaking parents, taken as a proxy for the concentration of sequential and

simultaneous bilinguals in each group. In addition, adults completed the DELE, a lengthier

proficiency test that has been used in other research on Spanish (e.g., Montrul & Slabakova, 2003).

Variable	SDB		HSA		HS7/8		HS5	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Frequency of use (max. 30)	19.7	6.1	12.1	4.8	16.1	5.4	17.8	6.5
BESA score (max. 18)	11.8	2.2	11.2	2.5	11.5	2.3	9.2	2.7
DELE score (max. 50)	47.6	1.6	33.3	8.8	——	——	——	——
Number of monolingual Spanish-speaking parents	1.8	0.3	0.1	0.9	1.1	0.8	0.9	0.9

Table 1. Group characteristics.

4.2. Tasks

There were four tasks in the present experiment. All adults took the experiment online, and

all children completed the tasks using laptop computers in their schools in the presence of the

researcher. All participants completed a brief questionnaire investigating their use of Spanish in

six contexts along 1-5 Likert scales, the sum of which comprised the frequency of use score in the

statistical modeling, as well as the BESA, which contained eighteen questions concerning

morphosyntactic proficiency in Spanish. In addition, there were two experimental tasks used to

address the acquisition of DOM. Both tasks shared the same communicative context about a

mom's wishes for her twin daughters and younger son while preparing for sleepaway camp. To

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[3]   The schools were matched for multiple demographic characteristics, and additional tests were
      conducted to assure that there were no differences between participants' proficiency level,
      frequency of use of Spanish, and home language background in the two schools. This
      information is omitted here were omitted due to space limitations; see Author (xxxx).

avoid potential confounding variables in HS' mood systems, all verbs were morphologically regular, disyllabic, and ended in –ar, the first and most frequent conjugation class. The same verbs were used in both tasks. Similar to Montrul and Sánchez-Walker's (2013) experiment, the adults completed additional distractors in both tasks that reduced their predictability, but children's tasks were kept brief to accommodate their limited attention spans.

The first task was the sentence completion task (SCT), in which participants needed to record their voices completing a series of sentences. There were ten stimuli targeting the production of DOM in subordinate clauses, as this experiment also tested speakers' command of subjunctive and indicative mood morphology. There were six distractors in the children's version and an additional 31 distractors in the adults' version testing other grammatical properties. In this experiment, participants read a series of sentences for each item and then needed to complete the subordinate clause in the final sentence by recording their voice. The infinitival form of each verb appeared in parentheses, followed by *Juanito*, the name of the younger brother. Participants needed to supply an inflected form of the verb as well as any other words, such as the *a* object marker, that they determined were necessary. The subject of all of the subordinate clauses was *las hermanas* (*the sisters*), which increased the salience of DOM: using third person plural subjects resulted in the –an verbal suffix, rather than the /a/ inflection in third person singular that has been shown to be vulnerable to salience effects (Bhatt et al., 2015; Sagarra et al., 2019). Sentence (3) is an example item from the SCT.

(3) Juanito siempre va al parque de juegos. ¿Qué quiere la mamá? Quiere que las hermanas _____ (LLEVAR) Juanito al parque de juegos.

Juanito always goes to the playground. What does the mother want? She wants for the sisters _____ (TAKE) Juanito to the playground.

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The morphology selection task (MST) tapped underlying knowledge of DOM. In these instances, participants read prompts and needed to select which of two choices they felt sounded best. The two choices differed only in the inclusion or omission of the preposition *a* between the verb and the direct object *Juanito*. In these sentences, DOM was tested following the structure *tienen que* (*they have to*) + infinitive. Since this task was administered in written form, the target region was boldfaced. There were also fourteen distractors for children and 47 for adults. Sentence (4) is an example item from the MST.

> (4) ¿Qué tienen que hacer las hermanas?
>   a.   Tienen que cuidar Juanito.
>   b.   Tienen que cuidar a Juanito.
>
> *What do the sisters have to do?*
>   a.   They have to take care of Juanito [no DOM].
>   b.   They have to take care of Juanito [DOM].

5. Results

All analyses were carried out through RStudio (R Core Team, 2022) through which the researcher calculated the production or selection of DOM across items in the SCT and MST.[4] A total of 128 responses from the SCT were omitted where the participants either produced grammatical alternatives to DOM by inserting extra words (e.g., *peinen el pelo de Juanito*, *they style the hair of Juanito*, rather than *peinen a Juanito*, *they style Juanito*), or in which participants did not save their response on the audio recorder, leaving 1,122 observations (88.3%). 27 responses from the MST were omitted in which the participant did not select a choice between two sentences, leaving 876 observations (99.5%). Therefore, there were a total of 2,155 observations for analysis, in which inclusion of the object marker *a* was assigned a score of 1, and omission of this structure

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[4]   Specific packages are cited in Author (xxxx) due to space limitations. All deidentified data and coding are publicly available at URL BLINDED.

was assigned a score of 0. Based upon these calculations, Table 2 and Figure 1 summarize the

percentages of DOM production and selection in the SCT and MST by group.

Group	EPT		FCT	
	Mean	SD	Mean	SD
SDB	98.0%	13.7%	99.3%	8.3%
HSA	55.4%	49.7%	85.1%	35.6%
HS7/8	43.5%	49.6%	83.8%	36.8%
HS5	34.4%	47.5%	69.8%	45.9%

Table 2. Average and standard deviation of subjunctive production and selection on EPT and FCT by group, reported as percentages.
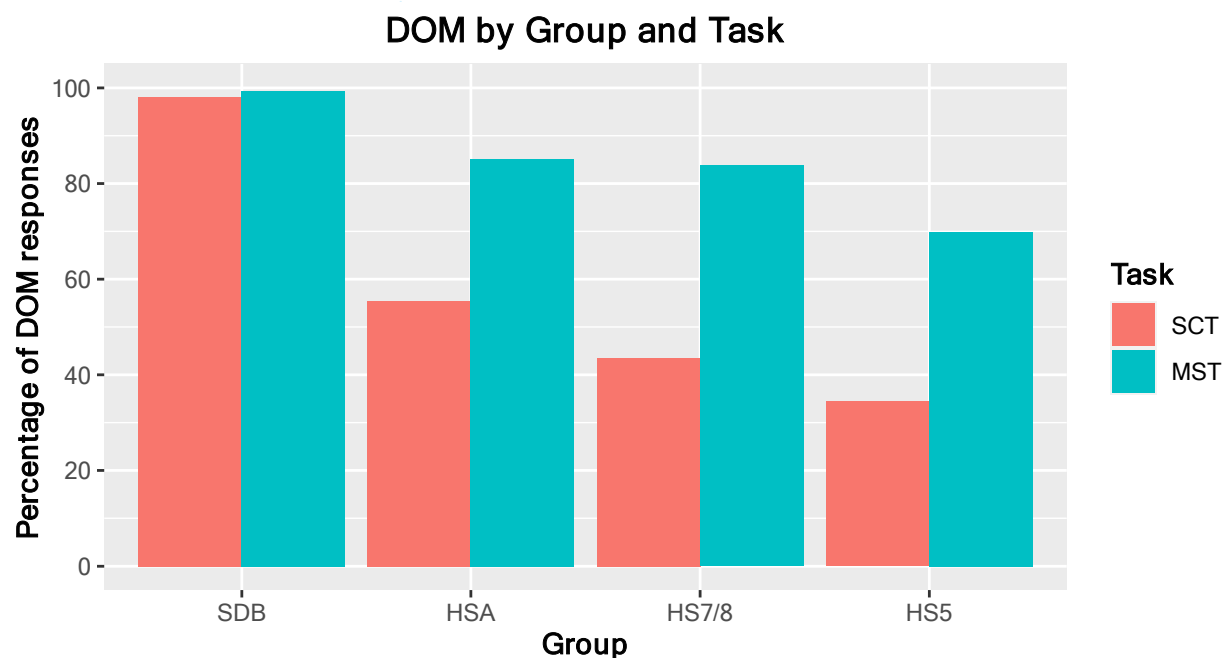
Figure 1. Percentages of DOM production and selection by group and task.

To explore these data further, a generalized linear mixed methods (GLMM) binary logistic

regression model was prepared. DOM production and selection was the binary dependent variable,

and group, task, BESA proficiency, and frequency of use of Spanish were independent variables.

The SDB and the SCT were selected as the baselines for group and task; participants' BESA scores

and frequency of use of Spanish were continuous variables standardized prior to analysis.

Participant and item were random effects. Table 3 shows the results of the model, summarized in

Figure 2. There were main effects for all three HS groups, the MST, and BESA proficiency, that

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were significant at the *p* < .05 level. The effects of group and task can be observed in Figure 1;

Figure 3 contains a visual summary of the effect of BESA proficiency, and Figure 4 summarizes

the relationship between frequency of use and DOM production and selection.

Fixed effect	Estimate	SE	*p*
Intercept	4.9770	0.7700	*< .0001*
HSA group	−4.5438	0.8110	*< .0001*
HS7/8 group	−5.1678	0.8123	*< .0001*
HS5 group	−5.9722	0.8047	*< .0001*
MST	2.4981	0.3311	*< .0001*
BESA proficiency score	0.6110	0.1797	*.0006*
Frequency of use	0.0433	0.1770	*.8065*

Table 3. Results of GLMM model.
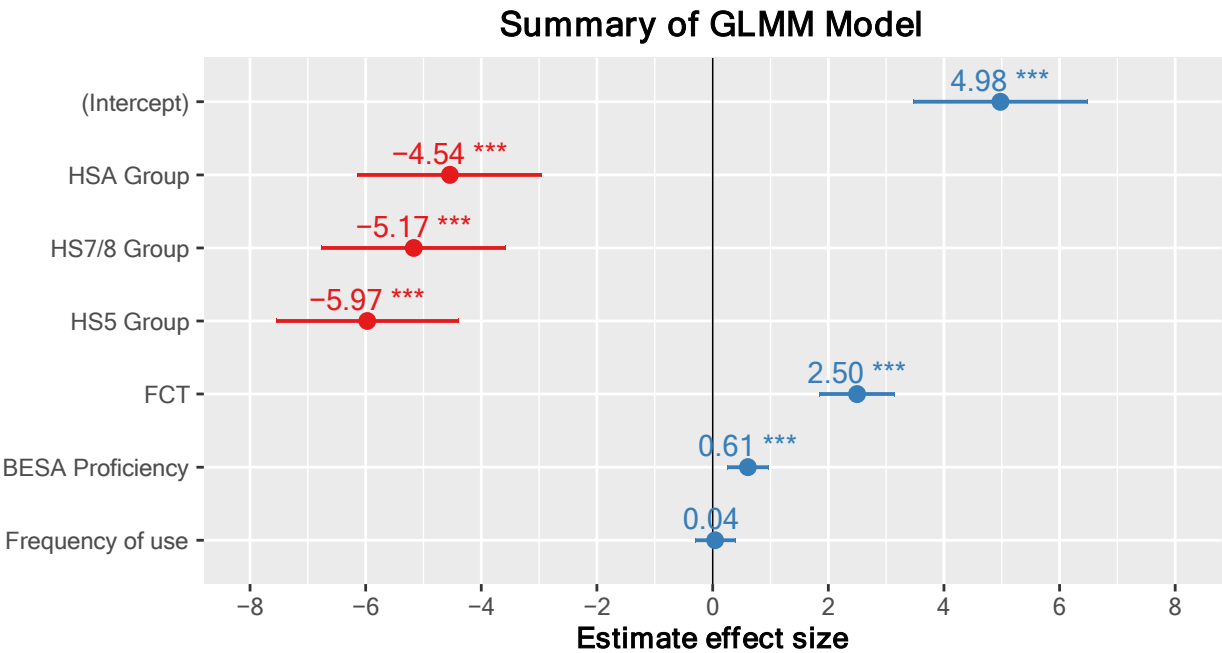
Figure 2. Results of GLMM model.

DOM by BESA Proficiency and Task
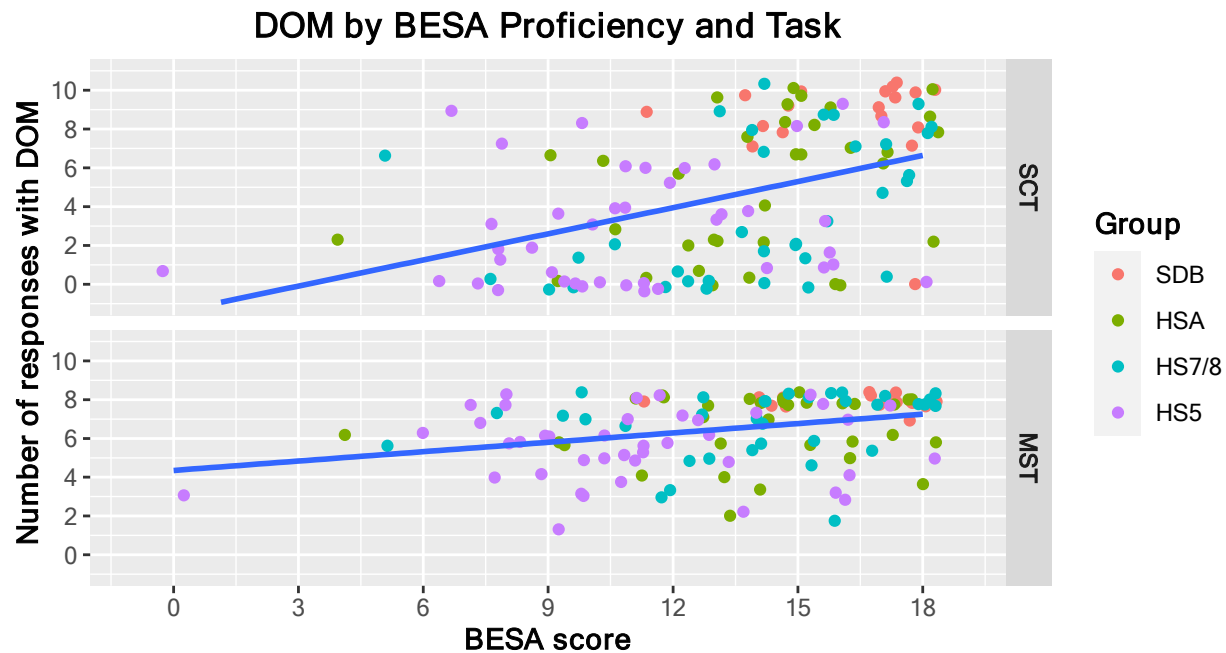
Figure 3. DOM production and selection by BESA proficiency score and task.

DOM by Current Frequency of Use and Task
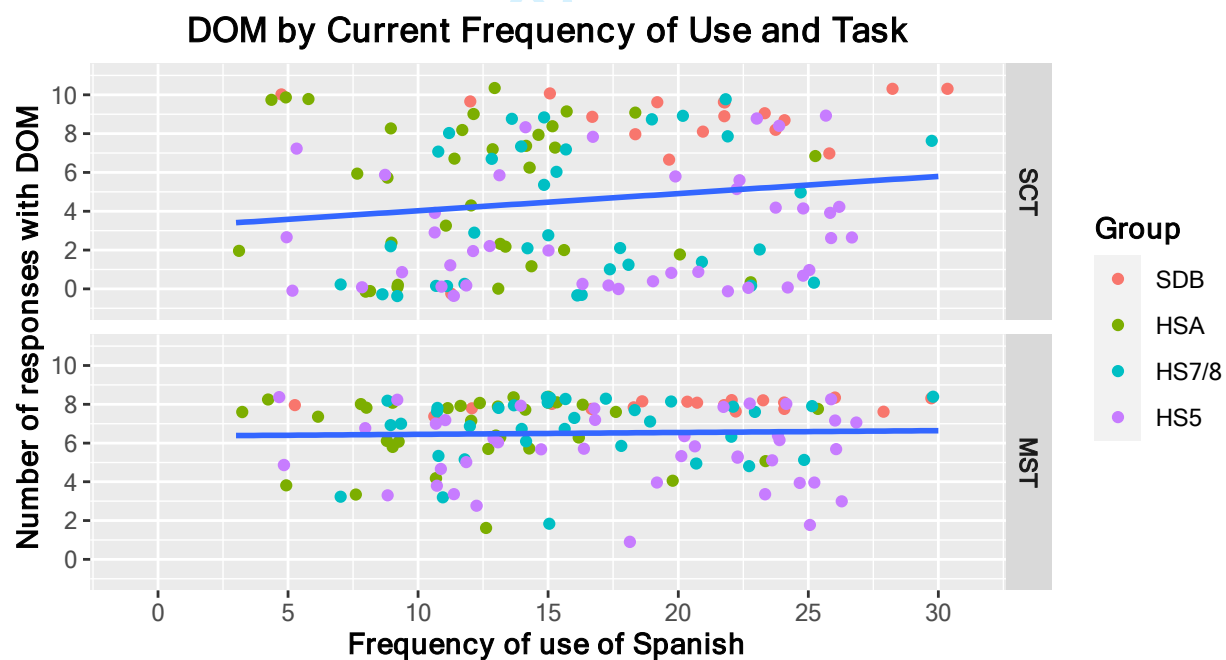
Figure 4. DOM production and selection by frequency of use of Spanish and task.

Consistent with Figure 1, HS were more likely to select DOM than to produce it, yet SDBs were categorical in both tasks. To explore differences within the HS groups, Tukey post-hoc comparisons were conducted, as summarized in Table 4. The difference between the HSA and

HS5 group was significant at the $p < .05$ level, but those between the HSA and HS7/8 as well as the HS7/8 and HS5 were not. Therefore, there is a gradual progression towards the adult-like system in HS' command of DOM, which is consistent with the descriptive statistics summarized in Table 2 and Figure 1.

Contrast	Estimate	SE	z	p
SDB – HSA	4.544	0.811	5.603	< .0001
SDB – HS7/8	5.168	0.812	6.362	< .0001
SDB – HS5	5.972	0.805	7.421	< .0001
HSA – HS7/8	0.624	0.465	1.342	.5360
HSA – HS5	1.428	0.445	3.209	.0073
HS7/8 – HS5	0.804	0.438	1.835	.2567

Table 4. Tukey post-hoc comparisons of groups.

Before turning to a discussion of results. Figure 5 presents the number of times each HS produced and selected DOM. Results indicate that the participant who used DOM least selected it one time and did not produce this structure, while all other 109 participants produced and/or selected this structure at least twice. This argues that bilinguals have not altogether lost or incompletely acquired DOM, but rather that HS experience variability in their command of this structure that is not evident in the SDB data.
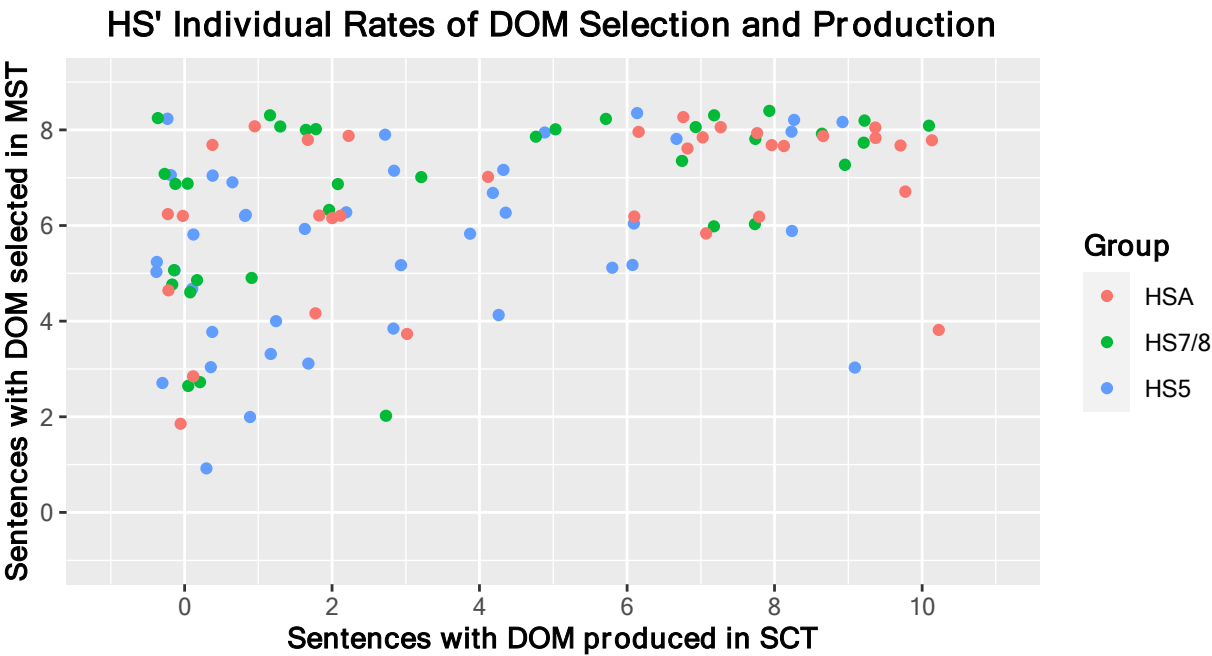
Figure 5. Levels of DOM production and selection by participant.

To summarize, there were differences between SDB and all HS groups, as well as gradual growth over HS age groups. Only the difference between the HSA and HS5 groups was significant at the $p < .05$ level, which suggests that HS continue to acquire DOM gradually throughout adolescence. This is consistent with the descriptive statistics and supports the hypothesis for RQ1. Participants' BESA proficiency, but not their frequency of use of Spanish, accounted for individual rates of DOM production and selection, which partially supports the hypothesis for RQ2. Finally, the effect for task shows that HS are more likely to select DOM than they are to produce this structure, in alignment with the hypothesis for RQ3. Furthermore, all participants produced or selected DOM at least once, and all but one participant did so at least twice, arguing against incomplete acquisition of complete attrition of this structure at the group level. Having summarized these results, it is possible to turn to a more general discussion of findings and their theoretical implications.

5. Discussion

The results of the present study show that HS continue to acquire DOM into adulthood, but their quantities of production and selection differ from those of SDB. These results are consistent with previous studies in multiple ways. Firstly, they are similar to those that have evaluated adult HS' production of DOM and that have revealed proficiency effects (Montrul, 2004; Montrul & Bowles, 2009). Secondly, they are in concert with Montrul and Sánchez-Walker's (2013) study, as bilingual adults show quantitatively higher levels of DOM production than children. Furthermore, these results are not dissonant with those in Guijarro-Fuentes & Marini's (2011) and Guijarro-Fuentes et al.'s (2017) studies of DOM development, although the children in this study showed greater variability. Although these researchers did not find age effects with the same age

group, there were no adult HS in their study. Since the increase in DOM production and selection in this study was subtle and only could be detected between the HSA and HS5 groups, it is plausible that the statistical modeling could not significantly detect age effects in their study in the absence of older participants.

On one hand, these findings argue in favor of the predictions of incomplete acquisition whereby HS do not converge on the tendencies of other populations of native speakers, even in adulthood. However, the individual data argue against the altogether absence of DOM from speakers' linguistic repertoires. The present study exposes a key limitation of this framework insomuch that it is not capable of accounting for the finer-grained, gradient production and selection tendencies that HS have. However, there is no evidence of attrition in these data, so the present study also does not fully support Putnam and Sánchez's (2013) predictions of feature reassembly. These researchers correctly predict that HS will exhibit production-comprehension asymmetries, and that the effect of proficiency, which represents cumulative exposure (Giancaspro & Sánchez, 2021; López Otero, 2022), would account for differences between individual speakers. However, there is no evidence that HS are progressively losing DOM at older ages due to the reassembly of the D-feature, as production and selection of this particular structure increased as participants grew older.

The present study joins López Otero (2022) in arguing that some of the tenets of Putnam and Sánchez's (2013) model accurately predict variability in HS' grammatical knowledge, but that these speakers do not show any effects of feature reassembly. Putnam and Sánchez (2013, p. 490) state that "Some late-acquired L1 FFs [functional features] may only be very weakly activated before being replaced, or, at the very least, existing in competition with, similar and identical FFs from the L2." This claim acknowledges that certain features may not receive high levels of

activation in their initial acquisition, which in turn exposes that there is the potential for addressing how Putnam and Sánchez's (2013) framework could be readjusted to account for the initial acquisition of these features rather than their reassembly. That is, HS' optionality could be due to a protracted bilingual acquisition process rather than a reassembly of features that had already been acquired. An intriguing possibility would be that the process of gradual feature reassembly could run in reverse in the initial acquisition of (morpho)syntactic structures, leading to production-comprehension asymmetries and differences in knowledge based upon patterns of exposure as HS continue to develop their grammars. This would be supported by the descriptive data, as the locus of differences between HSA and HS7/8 occurred in production, although both groups showed similar levels of DOM selection.

The present study therefore corroborates existing research that exhibits differential levels of attainment of DOM in HS adults when compared to SDB, which cannot be due to feature reassembly nor incomplete acquisition. HS do show gradient knowledge of the Spanish object marking system whereby they produce and select this structure in some instances, but not others. Based upon previous research (Hur, 2020), the lexical frequency of individual verbs could be at play in these speakers' gradient knowledge of DOM, which would be a viable avenue for continued research with a broad age group. Furthermore, it is possible that adult proficiency data, which were not analyzed here due to space limitations, would reveal slightly different effects. The proficiency measure analyzed in the present study only evaluated morphosyntactic knowledge with eighteen stimuli, while the additional test employed with adult participants was lengthier and also measured lexical knowledge. Future research could benefit from triangulating adults' scores on these measures to determine if they provide a consistent operationalization of proficiency across studies.

An additional area that merits attention is that there was a greater concentration of participants in the HSA group who were simultaneous bilinguals than in the HS5 and HS7/8 groups (see Table 1). Previous research on this topic has not found age of acquisition effects on Spanish HS' command of DOM (Bhatt et al., 2015; Montrul & Sánchez-Walker, 2013), for which there is likely a minimal role of age of acquisition on the outcomes of the present study. However, to maximize the comparison of age groups, future research may wish to control for age of acquisition and/or number of Spanish-speaking parents across all of the age groups.

In addition, there was one additional shortcoming of this study. Given the experiment was designed not only to elicit DOM but also mood morphology, there is the possibility that the complexity of the sentences in the SCT resulted in lower levels of production of this structure. In contrast, the *a* marker appeared in the matrix clause in the MST, where participants showed more robust command of this structure. Future research may wish to address this limitation by more strictly controlling the production and comprehension tasks used to observe bilingual children.

6. Conclusion

The present study evaluated older school-aged children and adults who were HS of Spanish regarding their production and selection of DOM. HS showed growth over the course of the age span studied, and proficiency modulated differences between individual speakers. HS produced more DOM on the SCT than they selected it on the MST. The latter findings support Putnam and Sánchez's (2013) approach to HL acquisition; however, the developmental trends observed due not point towards a reassembly of the D-feature responsible for DOM in Spanish. Therefore, these findings have implications for our understanding of HL acquisition more generally, whereby the data highlight the need for theories that can account for the initial acquisition of these features.

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