***Abstract:***

The present study investigated the production and receptive knowledge of the Spanish subjunctive mood in volitional clauses by 57 English-dominant heritage speakers in fifth, seventh, and eighth grades (ages 10-14), some of whom were enrolled in a dual-language immersion program. Children’s self-reported frequency of use of Spanish affected command of this structure, and participants showed more consistent selection of the subjunctive than production of this form. There were no differences in production or selection between children in the dual-language immersion and English-only schools, but older children produced and selected the subjunctive more than younger participants. The lexical frequency of individual verbs did not affect production or selection. These findings argue for the protracted development of this structure. The role for frequency of use and asymmetrical performance between tasks support Putnam and Sánchez’s (2013) activation approach to heritage language acquisition. However, the absence of an effect for bilingual schooling or lexical frequency and the increased use of subjunctive mood with age do not strictly align with theories emphasizing exposure effects.

Keywords: heritage language acquisition, dual-language education, subjunctive mood

**Home and School Exposure and Age Effects in the Heritage Language Acquisition of the Spanish Volitional Subjunctive**

**1. Introduction**

A central question in bilingual children’s development is how patterns of exposure characterize the acquisition of heritage languages (HLs). HLs are spoken in situations of language contact where speakers frequently develop stronger competence in a more socially prevalent language. The most researched example is Spanish heritage speakers (HSs) in the United States, who tend to experience a shift in dominance towards English at the start of schooling (i.e., Castilla-Earls et al., 2019; Hiebert & Rojas, 2021). Research on bilingualism has generally focused on preschool children and adults, so school-aged children are the “missing link” (Montrul, 2018, p. 534) in our understanding of HL development: comparisons of younger versus older children can distinguish between language attrition and protracted development.

Evaluating HL acquisition under different contexts of exposure and by comparing productive and receptive knowledge provides a more holistic view of HSs’ developmental trajectory. Along these lines, Putnam and Sánchez (2013) have argued that activation of the HL in the memory leads to processing input for intake, which strengthens the associations between lexical and formal features. 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.” Lohndal and Putnam (2021) claim that these abstract syntactic and semantic features are joined together in the formation of lexical items that are spelled out and interpreted. Putnam and Sánchez (2013) claim that decreases in HL exposure bring about crosslinguistic influence from the dominant language, which can cause variability in mapping features onto morphology to generate lexical items, and eventually can result in the reassembly of these features. Following these researchers, the reassembly process begins under the online pressures of language production due to decreases in exposure, such that bilinguals may show stronger receptive knowledge than what they exhibit in production. Moreover, Putnam and Sánchez (2013) predict that it is harder to map features together to create lexical items that are activated less-frequently in the memory. Therefore, HSs may be able to produce or interpret features that are realized on more-frequent lexical items.

This framework provides specific and testable predictions that can explain different acquisitional outcomes between individual HSs. Nonetheless, this approach applies a process of progressive language restructuring due to crosslinguistic influence, while other studies have shown the opposite, that HSs acquire Spanish in a protracted fashion over the childhood years (Corbet & Domínguez, 2020; Cuza & Miller, 2015; Cuza & Solano-Escobar, 2023; Martinez Nieto & Restrepo, 2022; Montrul & Potowski, 2007; Montrul & Sánchez-Walker, 2013). Therefore, a study testing the influence of both age and patterns of exposure is highly relevant for evaluating if and how these two approaches to HL acquisition may interact in accounting for child HSs’ development.

**2. Exposure, Heritage Language Development, and Dual Language Immersion**

There are multiple ways to empiricalize exposure. This study incorporates overall frequency of HL use, morphosyntactic proficiency, and bilingual education as metrics for exposure to explore HS children’s acquisition of subjunctive mood in volitional clauses. Proficiency and frequency of use have been used as proxies for HL exposure in recent research (Dracos & Requena, 2022; Giancaspro & Sánchez, 2019; López-Otero et al., 2023a, 2023b; Perez-Cortes, 2016). However, understanding the impact of exposure through education in the HL is an underexplored approach. To measure input at school, the present study compared Spanish HSs in a traditional English-only school with age-matched peers in a dual-language immersion (DLI) program where 50% of daily instruction is offered in Spanish during the elementary years.[[1]](#footnote-1)

Evaluating language development in DLI is an underexplored avenue for understanding the impact of exposure in childhood, as HSs enrolled in these programs purportedly receive greater quantity and quality of HL input at a critical developmental time. From the perspective of input quantity, DLI supplements home exposure to Spanish during the school years at a time when comparable children in traditional schools typically begin to exhibit a shift in dominance towards English (Castilla-Earls et al., 2019; Hiebert & Rojas, 2021). Monolingual children master the structure tested here, the volitional subjunctive, around the start of school (Blake, 1983; Dracos et al., 2019). Therefore, HL exposure may be especially impactful during this time in the acquisition of this structure. From the perspective of input quality, DLI schools purportedly offer students with access to vocabulary specific to academic content areas (larger lexicon) and to lengthier and more complex discourse (greater morphological and syntactic diversity).

To date, few studies have employed methods from bilingualism research to study the development of HSs’ Spanish language skills in DLI when compared to children of similar characteristics in English-only schools (but see Gathercole, 2002 and AUTHOR, XXXX). While bilingual education has previously been identified as facilitative in the acquisition of morphosyntax in German-dominant HSs, these studies focused on adults who were not actively enrolled in school (see Kupisch and Rothman, 2018). Therefore, exploring the productive and receptive knowledge of Spanish HSs with different quantities of input at home and school *at the time of testing* is important for research on HL development.

The volitional subjunctive is an ideal area of the Spanish inflectional system to investigate in such a context for four reasons. Firstly, it shows minimal to no dialectal variation, unlike some other subjunctive contexts (e.g., Faulkner, 2021). Secondly, monolingual children master the volitional subjunctive around the start of schooling (Blake, 1983; Dracos et al., 2019). Since HSs enrolled in DLI programs have a greater quantity of input in Spanish compared to peers educated in English only during the early school years, it is prudent to explore whether sustained exposure is especially impactful for mastering the subjunctive, or for preventing its attrition due to increased activation of English. Thirdly, the subjunctive typically occurs in subordinate clauses, so HSs’ acquisition of this structure may benefit from academic discourse in DLI programs that features complex, multi-clause sentences. Finally, the subjunctive is realized through verbal morphology, so it is possible to control for lexical frequency on productive and receptive tasks to most fruitfully test Putnam and Sánchez’s (2013) predictions. Additional research on the subjunctive is reviewed in the following section. The research questions, hypotheses, and methodology follow. After presenting results, this article concludes with a discussion of findings, their implications, and their limitations.

**3. Spanish Subjunctive Mood: Theory and Acquisition**

If patterns of exposure are deterministic in HL acquisition, a logical hypothesis is that structures that emerge late in monolingual populations will be particularly susceptible to input effects. The subjunctive is one such structure and is one of three moods in Spanish alongside the indicative and imperative (Seco, 1990). Mood is a morphological realization of modality, which is the evaluation of the truth value of propositions (Bosque, 2012). All Spanish verbal inflections are inflected for one of the three moods, although studies show that as few as 7.2% of inflected verbs are marked with subjunctive morphology (Biber et al., 2006). This points to its infrequence in the input that HSs receive, especially if this exposure is less in quantity compared to monolinguals.

There are two morphological paradigms for the subjunctive, one in the present tense and the other in the imperfective past. Both have forms for subject person and number agreement. This study concerns the present subjunctive, which is formed either through a shift in verbal inflection or through both a morphophonological change in the verb stem and a shift in inflection from the more-frequent indicative. The syntax and semantics of subjunctive mood have been the topic of considerable scholarship. Fábregas (2014) argues that subjunctive inflections comprise a single spell-out of multiple structures that differ in their syntactic and semantic representations. These inflections occur almost exclusively in subordinate clauses whose subject differs from the main clause. Some uses of the subjunctive, such as volitional clauses as in (1), result from a process of obligatory lexical selection, as a lexical item in the matrix clause subcategorizes for the subjunctive in tensed subordinate clauses with a distinct subject.

1. *Rosa quiere que Carmen venga a su casa.*

Rosa want-3PS-IND COMP Carmen come-3PS-SUBJ to her house.

Rosa wants Carmen to come to her house.

Following Kempchinsky (2009), subjunctive inflections in volitional clauses such as (1) are the morphological realization of an uninterpretable feature that is checked and deleted in the heads of Force and Fin.[[2]](#footnote-2) Working within feature-oriented frameworks, the task for the Spanish speaker in acquiring the volitional subjunctive is twofold. Firstly, one must learn which matrix items select the uninterpretable mood feature; secondly, one must map this feature onto (or interpret it through) inflectional morphology to generate lexical items.

In contrast to Spanish, English has a less-utilized subjunctive. Acceptability judgment data have shown that the English indicative exists as a grammatical alternative to the subjunctive (Iverson et al., 2008; Rojas, 1998). In addition, English lacks a morphological paradigm that is specific to mood, as it is marked through past tense forms. Moreover, English requires control structures in volitional contexts where subjunctive mood is expected in Spanish. For instance, in place of the subordinate clause in sentence (1), English would use the infinitival construction *Rosa wants Carmen to come-INFINITIVE to her house*. Therefore, the volitional subjunctive is a crosslinguistic difference between English and Spanish at both the syntactic and morphological levels. As a result, HSs must acquire and maintain the syntax, semantics, and morphology of the Spanish mood system, which emerges late even in monolingual children, on the basis of less input than monolinguals and in the face of crosslinguistic influence from English. Putnam and Sánchez’s (2013) approach would predict that decreasing HL activation would result in crosslinguistic influence from English. This would lead to increased difficulty in mapping subjunctive inflections onto subordinate verbs, especially those that are infrequent, or eventually to the complete reassembly of the uninterpretable mood feature at the representational level.

*3.1. Monolingual Acquisition*

Monolingual Spanish-speaking children begin producing subjunctive inflections before age three, but studies show that monolingual children between ages four and five have not yet reached categorical subjunctive production (Aguirre, 2003; Blake, 1983; Dracos et al., 2019; López-Ornat et al., 1984). The subjunctive emerges in volitional clauses before other syntactic contexts, yet later than other verbal inflections (Mariscal, 2009; Pérez-Leroux, 1998; Rodríguez-Mondoñedo, 2008). Since even monolingual children require extensive exposure to master the subjunctive, more than other structures, exposure may be particularly impactful when HSs’ input spaces are divided between two (or more) languages.

*3.2. Heritage Language Acquisition of Subjunctive*

The available longitudinal data on English-Spanish bilingual children underscore that exposure influences this group’s acquisition of the subjunctive. Two case studies on English-Spanish simultaneous bilingual siblings with different quantities of HL input reveal attrition of subjunctive around the start of schooling by the sibling with less exposure (Anderson, 2001; Silva-Corvalán, 2014). Similarly, Merino (1983) reported that 32 simultaneous bilingual children in an English-only school showed decreased subjunctive production over two years.

Cross-sectional work on older children has also provided evidence for exposure effects. Dracos and Requena (2022) found that proficiency and frequency of exposure, but not age, affected volitional subjunctive production, but this study lacked a large number of older children with which to plot development into adolescence. Potowski (2007b) also found that adolescent HSs in a DLI program produced less subjunctive across six syntactic contexts than Spanish-dominant peers. Finally, Flores et al. (2017) found that German-dominant HSs of Portuguese who had higher exposure to their HL showed growth in subjunctive mood production between ages 8 and 12, while children with less exposure achieved comparable growth after age 13 only. The latter study suggests a relationship between age and exposure. However, in this instance, exposure drove the rate of development (how quickly child HSs experienced growth) rather than the rate of reassembly (how quickly child HSs experienced variable form-function mappings or reassembly of the mood feature). Across these studies, there is not yet an experiment comparing productive and receptive knowledge in bilingual children, nor one that controls for both home and educational exposure to the HL.

Research on bilingual adults has been largely consistent. Despite van Osch and Sleeman’s (2018) finding that volitional clauses comprise the most stable context of subjunctive mood in adult HSs, these bilinguals are more precise in their command of the subjunctive at higher proficiency levels and with more frequent HL use (Giancaspro, 2019b; Montrul, 2009; Perez-Cortes, 2016). Furthermore, factors such as the morphological regularity and lexical frequency of the subordinate verb affect adult HSs’ production and interpretation of subjunctive mood (Giancaspro, 2020; Giancaspro et al., 2022; Perez-Cortes, 2022), but neither has been explored with bilingual children. In fact, previous studies within Spanish as a HL have revealed frequency effects with adults (AUTHOR, XXXX; Giancaspro, 2020; Hur, 2020; Hur et al., 2020; López-Otero, 2023; Perez-Cortes, 2022), but only one has explored frequency with only two verbs in child HSs (Goldin et al., 2023). Therefore, exploring the influence of lexical frequency with bilingual children not only provides a nuanced account of subjunctive development, but also has broader implications for HL acquisition.

**4. The Study**

To contribute to the growing body of research that emphasizes the importance of HL exposure, a study that measures HL proficiency and use *and* method of schooling with multiple age groups of HSs and that incorporates productive and receptive tasks and that considers lexical frequency is necessary. Based on the research reviewed thus far, four research questions (RQs) were proposed:

1. How do HSs in a DLI school compare age-matched HSs without bilingual education in the production and selection of the volitional subjunctive?

Putnam and Sánchez’s (2013) framework would predict that HSs with more-frequent exposure to and processing of Spanish would show greater consistency in mapping the subjunctive onto lexical items and less evidence of reassembly of the mood feature. Therefore, it was predicted that HSs in DLI who have greater exposure to Spanish would produce and select more volitional subjunctive than age-matched peers in an English-only school.

1. Do morphosyntactic proficiency in and frequency of use of Spanish affect individual HSs’ rates of volitional subjunctive production and selection?

Putnam and Sánchez’s (2013) approach to HL acquisition would posit that proficiency and frequency of use affect HSs’ subjunctive mood knowledge. Previous studies on child and adult HSs have found that both variables are predictive of rates of subjunctive production, acceptability judgment, and interpretation (Dracos et al., 2022; Flores et al., 2017; Montrul, 2009; Montrul & Perpiñán, 2011; Perez-Cortes, 2016). The same effect was predicted in this study, whereby HSs who obtain higher proficiency scores and who report using Spanish more frequently would produce and select the volitional subjunctive more often.

1. Do older HSs show increased production and selection of the volitional subjunctive?

Since exposure to the HL likely decreases as children become older due to the prevalence of English in school, Putnam and Sánchez (2013) would predict that school-aged HSs would experience greater difficulty consistently mapping features onto inflectional morphology, particularly in production, as they get older. While subjunctive attrition has been found in HSs in early and middle childhood (Anderson, 2001; Merino, 1983; Silva-Corvalán, 2014), previous studies have lacked a substantial group of late-childhood and adolescent participants. However, the closest available data with older HSs of Portuguese from Flores et al.’s (2017) study shows protracted development of subjunctive mood, rather than attrition. Therefore, it was predicted that the older participants (7th/8th grade; ages 12-14) would produce the volitional subjunctive and select it more frequently than younger participants (5th grade; ages 10-11).

1. Do HS children exhibit asymmetries between productive and receptive knowledge of volitional subjunctive?

Putnam & Sánchez’s (2013) framework argues that individuals with less-frequent use of Spanish possess stronger receptive knowledge than they exhibit in production. Previous research on the subjunctive supports this position (Perez-Cortes et al., 2019). Therefore, it was predicted that HSs in the DLI program, as well as those who reported frequent use of Spanish overall, would not show differences between rates of volitional subjunctive production and selection. In contrast, those who reported lower activation and who were in an English-only school would select more volitional subjunctive than they would produce it.

1. Does the lexical frequency of the subordinate verb affect child HSs’ production and selection of volitional subjunctive?

Putnam and Sánchez (2013) argue that HSs are more likely to produce and select inflectional morphology on more-frequent lexical items. Furthermore, research on adult HSs has found that the lexical frequency of the subordinate verb affects its production and interpretation (Giancaspro, 2020). Finally, the one available study on child HSs’ frequency effects found that young bilingual children were more likely to produce the expected verbal agreement morphology with a frequent verb when compared to an infrequent one (Goldin et al., 2023). For this reason, it was predicted that HSs would produce the volitional subjunctive and select it more frequently when the subordinate verb onto which the mood feature is mapped is more frequent.

*4.1. Participants*

57 English-dominant Spanish HS children completed this experiment. Four groups of HS children participated: HSs in DLI in 5th grade (DLI-5; *n* = 19) and 7th/8th grades (DLI-7/8; *n* = 13), as well as HSs in a monolingual English school in 5th grade (MLE-5; *n* = 14) and 7th/8th grades (MLE-7/8; *n* = 11). Participants in 5th grade were 10-11 years old, and those in the 7th/8th grade group were 12-14 years old. The comparison of HSs to one another can isolate how certain factors related to language experience, such as bilingual schooling and age, affect the acquisition of Spanish morphosyntax, and moves away from conventional HS-versus-monolingual comparisons (Rothman et al., 2023).

|  |  |  |  |
| --- | --- | --- | --- |
| **School** | **5th** | **7th/8th** | **Total by school** |
| DLI | 19 | 13 | **32** |
| Monolingual English | 14 | 11 | **25** |
| **Total by grade group** | **33** | **24** | **57** |

**Table 1.** Division of participants by grade and school.

In the DLI school, HSs received 50% of instruction in Spanish each day from kindergarten through fifth grade. After sixth grade, they continued to receive a daily Spanish for HSs course at the same school, but no longer received content courses in Spanish. To participate, children needed to have attended the DLI school for at least half of elementary school (second grade or earlier). The 5th graders represent the “finished product” of elementary DLI programs; the 7th/8th grade groups enable comparisons with Potowski’s (2007b) study and address the absence of bilingual children of this age range in other studies. The age-matched peers in the MLE school had not received any bilingual or world language instruction during their schooling.

The monolingual and DLI schools were selected because both schools’ demographic reports indicated matching percentages (within 1%) of Latinx families and students with low socioeconomic status (measured through family income). According to questionnaire data, while some children’s parents spoke English, all spoke Spanish, and all participants were predominantly exposed to Spanish at home (see Table 2). Children in both schools were primarily of Mexican descent, although there were also participants who spoke Dominican and additional Central American varieties of Spanish.

18 Spanish-dominant bilingual adults (SDBAs; average age: 33.6, SD = 10.1) also completed this experiment. These adults were included to norm the tasks and confirm that they elicited the expected the subjunctive morphology. These bilinguals were from a seven Spanish-speaking countries and averaged 9.5 years in the United States. They primarily worked and resided in the same region where the two schools were located, and most students at a large regional university. These bilinguals’ data are presented in Figures 1 and 2 to verify that they used the subjunctive categorically in this experiment, but they were not submitted for further analysis, because the purpose compare HSs to one another based upon contexts of exposure, rather than to other groups of bilinguals (see Rothman et al., 2023). Table 2 provides a summary of each group’s proficiency using a subset of the Bilingual English-Spanish Assessment (Peña et al., 2014), frequency of use of Spanish (as calculated across six contexts using a language questionnaire described at greater length below), and number of monolingual Spanish-speaking parents.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **SDBA**  **(*n* = 18)** | | **DLI-7/8**  **(*n* = 11)** | | **MLE-7/8**  **(*n* = 13)** | | **DLI-5**  **(*n* = 19)** | | **MLE-5**  **(*n* = 14)** | |
| **μ** | **SD** | **μ** | **SD** | **μ** | **SD** | **μ** | **SD** | **μ** | **SD** |
| Frequency of use of Spanish  (max. 30 points) | 15.2 | 5.9 | 15.7 | 4.7 | 14.0 | 4.6 | 15.5 | 6.2 | 13.7 | 4.2 |
| Proficiency score  (max. 14 points) | 12.1 | 2.0 | 12.0 | 2.3 | 11.5 | 2.2 | 9.3 | 3.3 | 9.0 | 2.4 |
| Number of monolingual Spanish-speaking parents | 1.9 | 0.2 | 1.0 | 0.9 | 1.4 | 0.8 | 0.9 | 0.9 | 1.4 | 0.9 |

**Table 2.** Participant group averages with standard deviations.

*4.2. Method and Tasks*

All tasks were administered using Qualtrics software. A software known as Phonic was embedded into Qualtrics to record participants’ responses on the production task. Children carried out the experiment in their schools with the researcher present; the SDBAs carried out the study asynchronously online.

*4.2.1 Language background tasks.* Before completing the experiment, participants completed a language questionnaire. Since the youngest children in this study were 10 years old, it was determined that these individuals would be able to complete this questionnaire independently, which provides a more direct measurement of their use of Spanish away from home. This approach has been shown to be effective with high psychometric validity with children younger than those in the present study (Castilla-Earls et al., 2022). The questionnaire asked participants to indicate when they began attending their school and to rate how frequently they used Spanish in six contexts: with parents, with family members, at school, with friends, in public, and while watching television. Participants indicated how often they used Spanish in each context using 1-5 Likert scales with fixed descriptors (0: never, 1: hardly ever, 2: 3-4 times per week, 3: 1-2 times per day, 4: every day/almost always, 5: always). The sum of these Likert scales comprised each participant’s 30-point overall frequency of use score.

Subsequently, participants completed part of the Bilingual English-Spanish Assessment (BESA; Peña et al., 2014) to measure Spanish morphosyntactic proficiency. This task included eighteen stimuli testing inflectional morphology, although four questions were not reported here because they evaluated subjunctive mood, whose inclusion would be tautologous. The remaining questions targeted gender/number agreement (*k* = 4), verbal agreement (*k* = 4), preterit aspect morphology (*k* = 2), and clitic gender (*k* = 4). The number of correct responses comprised each participant’s proficiency score. Participants responded to each prompt by writing a full sentence.

*4.2.2. Experimental tasks.* In addition to the questionnaire and proficiency test, there were two tasks centered around the same communicative context, in which a mother shared how she wanted her twin daughters to care for their younger brother, Juanito, while away at sleepaway camp. The same eight verbs listed in Table 3 were used once per task. All verbs pertained to the most-frequent first conjugation class (*–ar*) and were disyllabic and transitive.[[3]](#footnote-3) The lemmatic frequency[[4]](#footnote-4) of each verb was calculated from the Davies (2016) *Corpus del español*, a large database used in previous research on the subjunctive (e.g., Giancaspro, 2020; Perez-Cortes, 2022). Since this corpus has been shown to correlate with HSs’ self-reported lexical frequency ratings (AUTHOR, XXXX), it was determined to be an appropriate source for analyzing the impact of lexical frequency on participants’ mood selection tendencies. The lemmatic frequency for each in the Davies (2016) corpus also appears in Table 3.

|  |  |  |
| --- | --- | --- |
| **Spanish** | **English** | **Davies (2016) frequency** |
| *amar* | to love | 60,260 |
| *cuidar* | to care for | 208,649 |
| *llamar* | to call | 303,936 |
| *llevar* | to take/carry | 1,192,620 |
| *mirar* | to look at | 186,441 |
| *peinar* | to comb | 6,151 |
| *pintar* | to paint | 45,606 |
| *tratar* | to treat | 590,952 |

**Table 3.** List of verbs used across tasks with their lexical frequency.

The production task contained a trial and 16 experimental items and followed a sentence completion format. There was a brief written prompt, and participants needed to complete the final sentence orally using the verb in parentheses, as well as any other necessary words. 8 items targeted the subjunctive mood following the matrix verb *querer* (‘to want’), as in (2). In addition, 4 stimuli tested knowledge of the indicative mood following the matrix verb *creer* (‘to believe’), and 4 were fillers. Only the eight subjunctive items were analyzed, but the additional sentences were included to prevent responses from becoming predictable.

1. *A veces Juanito se pone triste si sus hermanas dicen que no quieren hablar con él. ¿Qué quiere la mamá? Quiere que las hermanas \_\_\_\_\_\_\_\_\_ (LLAMAR) Juanito cada noche.*[[5]](#footnote-5)

Sometimes Juanito gets sad if his sisters say that they don’t want to talk with him. What does the mother want? She wants that the sisters \_\_\_\_\_\_\_\_\_ (CALL) Juanito every night.

For the selection task, participants again read prompts related to the mother’s desires for her children. There was a total of 23 items in the task. As in the production task, 8 items targeted the subjunctive in volitional clauses following *querer*, as in (3), 3 targeted the indicative mood with *creer*, and the remaining 12 were fillers. Only the subjunctive items were analyzed. In this task, participants read two sentences that described the prompt, and needed to select which one looked best. These sentences differed only in the use of the subjunctive or indicative. Therefore, this task tapped participants’ underlying knowledge of mood, as it required that they discern between the indicative and subjunctive without requiring HL production.

1. *La mamá sabe que las hermanas no siempre hablan con Juanito. ¿Qué quiere la mamá?*
2. *\*Quiere que las hermanas lo miran cuando hablan con él.*
3. *Quiere que las hermanas lo miren cuando hablan con él.*

The mother knows that the sisters don’t always talk with Juanito. What does she want?

1. She wants the sisters to look at (\*indicative) him when they talk with him.
2. She wants the sisters to look at (subjunctive) him when they talk to him.

**5. Results**

*5.1. Analysis*

After administering the tasks, all data were manually coded, and a binary score was assigned to each response based upon the suppliance of the anticipated mood. Only the stimuli testing the subjunctive mood were included for analysis. All instances in which participants produced or selected the expected subjunctive form received a score of *1*, and all other forms were assigned a score of *0*. In the production task, forms with correct mood inflections but with tense or agreement morphology that did not match the prompt were accepted with a score of *1* because this study did not concentrate on these morphological categories. This comprised the binary dependent variable for both the descriptive and inferential statistics.

There were 30 instances in the HSs’ data from the production task where there were errors with participants’ audio recording or in which responses were not related to the stimuli. These observations were discarded, leaving 426/456 (93.4%) available for analysis. The children produced the subjunctive in a total of 193/426 instances (45.3%), and alternative forms in the remaining 233 instances (54.6%). While indicative substitution was by far the most frequent alternative, followed by infinitival forms, there were also alternative structures used in the HSs’ data, as summarized in Table 4.

|  |  |
| --- | --- |
| **Structure** | **Observations** |
| Indicative mood | 177 (75.9%) |
| Infinitive | 35 (15.0%) |
| *Ir a* (*going to*) periphrastic future | 13 (5.5%) |
| Uncategorizable forms | 4 (1.7%) |
| Modal verbs in indicative | 3 (1.2%) |
| Preterit | 1 (0.4%) |

**Table 4.** List of alternative structures (total 298) to subjunctive mood in HSs’ data. [[6]](#footnote-6)

Additional data were coded to generate independent variables. Firstly, participant group (DLI-7/8, MLE-7/8, DLI-5, MLE-5) was coded to allow for a comparison between each of these groups in the descriptive statistics. Moreover, each HS participant’s grade group (5th grade versus 7th/8th) and school (DLI versus MLE) were included as categorical variables so that these two factors could be evaluated independently. Additional data from the BESA proficiency task and language questionnaire were analyzed to generate a pair of continuous variables. Each participant’s proficiency score was calculated as the number of expected answers on the BESA morphosyntax subsection (maximum 14; see Table 2), and frequency of use was operationalized by adding together the 1-5 Likert scales for the six contexts of language use on the questionnaire (maximum 30; see Table 2). Finally, lexical frequency was calculated by reporting the lemmatic frequency from the Davies (2016) corpus, as described above.

The latter three variables (proficiency, frequency of use, and lexical frequency) were continuous, so they were standardized to refit them along the same scale in the statistical modeling. All data were anonymized and uploaded to a GitHub repository (BLINDED). Data analysis was carried out in RStudio (R Core Team, 2022) using the *lme4* (Bates et al., 2015), *lmerTest* (Kuznetsova et al., 2017), and *tidyverse* (Wickham et al., 2019) packages.

*5.2. Descriptive Analysis*

HSs’ and SDBAs’ rates of subjunctive production and selection are summarized by group in Figures 1 and 2 below. As anticipated, the SDBAs used the subjunctive invariably, confirming that the tasks accurately elicited subjunctive morphology. Since the HSs were the focal point of the present project, the SDBAs’ data are not analyzed further. These figures show that the 7th/8th grade groups produced and selected more subjunctive than the 5th grade groups, implying that children develop knowledge of the volitional subjunctive with age. However, there were no discernible differences between children in the DLI and English-only schools. All HS groups selected the subjunctive more frequently on the selection task than they produced this structure.



**Figure 1.** Percentages of subjunctive production and selection by group and task.



**Figure 2.** Summary of number of subjunctive sentences produced or selected by group and task.

Figure 3 summarizes HSs’ production and selection of volitional subjunctive by proficiency level, Figure 4 summarizes production and selection by frequency of use of Spanish, and Figure 5 plots the role of lexical frequency on production and selection tendencies. These figures point towards a role for proficiency and frequency of use of Spanish, but argue against any lexical frequency effects.



**Figure 3.** Production and selection of volitional subjunctive by BESA proficiency.



**Figure 4.** Production and selection of volitional subjunctive by frequency of use of Spanish.



**Figure 5.** Production and selection of volitional subjunctive by verb, organized from most to least frequent as rated in the Davies (2016) corpus.

*5.3. Individual Analyses*

Additionally, individual analyses were conducted by calculating the total number of subjunctive forms that each participant produced and selected. Figure 3 illustrates that all HSs produced or selected the subjunctive in at least two contexts. This argues against the altogether absence of this structure from HSs’ grammar, and instead that it is present in their linguistic repertoire, even if it is used and mapped onto morphology variably as Lohndal and Putnam (2021) predict.



**Figure 3.** Individual rates of production and selection of subjunctive by participant.[[7]](#footnote-7)

Six participants produced and selected the subjunctive in all 16 contexts. These participants’ characteristics are listed in Table 6. That 5/6 of the participants were in the 7th/8th grade group further implies an effect for age, but there were no clear trends involving school, proficiency, frequency of use of Spanish, or parental bilingualism. In fact, three of these participants, one of whom attended the DLI school, reported never using Spanish at school.[[8]](#footnote-8)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Part.** | **Group** | **Freq. of use** | **School use** | **BESA** | **Parental languages** |
| H5B10 | DLI-5 | 5/25 | 0/5 | 7/14 | 1 Spanish only, 1 bilingual |
| H7B03 | DLI-7/8 | 8/25 | 1/5 | 8/14 | 1 Spanish only, 1 bilingual |
| H8B04 | DLI-7/8 | 19/25 | 3/5 | 11/14 | Both Spanish only |
| H8M02 | MLE-7/8 | 11/25 | 0/5 | 14/14 | 1 Spanish only, 1 bilingual |
| H8M06 | MLE-7/8 | 15/25 | 0/5 | 14/14 | Both Spanish only |
| H8M13 | MLE-7/8 | 13/25 | 2/5 | 12/14 | Both bilingual |

**Table 6.** Characteristics of HS children who produced and selected subjunctive mood at ceiling.[[9]](#footnote-9)

In comparison, there were three children, whose characteristics are summarized in Table 7, who selected the subjunctive in two instances and did not produce it. All three of these children were in the 5th grade age group. Furthermore, these participants reported using Spanish outside of school in less than half of their interactions, which also aligns with the prediction that low exposure to Spanish modulates subjunctive production and selection.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Part.** | **Group** | **Freq. of use** | **School use** | **BESA** | **Parental languages** |
| H5B18 | DLI-5 | 9/25 | 2/5 | 9/14 | Both Spanish only |
| H5M01 | MLE-5 | 10/25 | 2/5 | 14/14 | Both Spanish only |
| H5M02 | MLE-5 | 12/25 | 1/5 | 7/14 | Both Spanish only |

**Table 7.** Characteristics of HS children who produced and selected the fewest instances of subjunctive mood.

*5.4. Inferential Statistics*

To further evaluate these data, a Generalized Linear Mixed Methods (GLMM) binomial logistic regression models was necessary. The binary dependent variable was the suppliance of subjunctive mood as described in the previous section. HSs’ data from both the production and selection task were incorporated in the same model. Given there were multiple predictors and interactions necessary to address all of the research questions, nested model comparisons were carried out through pairwise comparisons to determine the model of best fit. Pairwise comparisons were conducted manually by adding one predictor into each model and comparing these models using the *anova* function in RStudio. The predictors for the pairwise models were school group (DLI versus MLE), age group (5th grade versus 7th/8th grade), BESA proficiency score, frequency of use, task (production versus selection), lexical frequency, and three two-way interactions: school group by age group, school group by task, and frequency of use by task. In the pairwise comparisons, the model with random intercepts for participant and item and fixed effects for school, grade group, proficiency, frequency of use, and task accounted for the greatest percentage of variance (AIC = 949.18, χ2 = 17.87, *p* < .0001). Finally, this model, which contained random intercepts only, was compared to a similar model with the same fixed effects but with participant and item as random intercepts and random slopes, in line with Cunnings (2012). The second model failed to converge, so the first model containing participant and item as random intercepts only was retained.

The final GLMM model (AIC = 949.2) contained school, grade group, frequency of use, BESA proficiency, and task as predictors with participant and item as random intercepts. The 5th grade group and the production task were set as reference levels. The model revealed main effects for the 7th/8th grade group (*β* = 1.47, SE = 0.46, *p* = .0013), frequency of use (*β* = 0.52, SE = 0.23, *p* = .0220), and the selection task (*β* = 1.13, SE = 0.20, *p* < .0001). These results imply that older HSs show stronger knowledge of subjunctive mood, and that participants were more likely to select the subjunctive than they were to produce it. Both findings are consistent with the data reported in Figures 1 and 2.

**6. Discussion**

The present study is the first to compare productive and receptive knowledge of subjunctive mood across multiple age groups of school-aged Spanish HSs, and adopts a novel approach by evaluating HL exposure through different methods of schooling. The first RQ investigated whether HSs in a DLI program differed from other HSs in an English-only school in their command of the volitional subjunctive. It was predicted that participants in the DLI school would recognize and produce this structure more consistently than monolingually-educated peers. Contra the predictions, there were no differences observed between the HSs in the DLI program and those in the English-only school. On the surface, this finding does not support theories of language acquisition that posit a central role for exposure and activation, a result that merits further discussion below.

The second RQ evaluated whether proficiency and frequency of use would affect rates of subjunctive production and selection. It was predicted that both variables would affect the production and selection of the volitional subjunctive, although only frequency of use accounted for speakers’ mood tendencies. Therefore, participants’ overall patterns of language use predicted their command of the volitional subjunctive, but proficiency did not, which partially supports the hypothesis. The finding that frequency of use was predictive of individual differences in subjunctive production and selection aligns with Putnam and Sánchez’s (2013) model.

The third RQ evaluated the role of age in the HL acquisition of the volitional subjunctive. It was predicted that older children would have greater volitional subjunctive production and selection, which is consistent with results, as the 7th/8th grade group used the volitional subjunctive more frequently than the 5th grade group. These findings align with a growing number of studies on other areas of the Spanish inflectional system revealing protracted development (i.e., AUTHOR, XXXX, XXXX; Corbet & Domínguez, 2020; Cuza & Miller, 2015; Cuza & Solano-Escobar, 2023; Martinez Nieto & Restrepo, 2022; Montrul & Potowski, 2007; Montrul & Sánchez-Walker, 2013; see also Flores et al., 2017 concerning the Portuguese subjunctive).

The fourth RQ evaluated whether HS children would show asymmetrical productive and receptive knowledge of the volitional subjunctive. Putnam and Sánchez’s (2013) theory posits stronger receptive knowledge for speakers with less-frequent exposure, so it was predicted that HSs with lower reported use of Spanish and who attended the English-only school would show stronger performance on the selection task. However, HSs as a whole selected the subjunctive more frequently than they produced it, regardless of exposure patterns. These task asymmetries are also consistent with Perez-Cortes’ (2016) study on the subjunctive mood; however, unlike in Perez-Cortes (2016), frequency of use did not modulate these asymmetries.

Finally, RQ5 addressed the role of lexical frequency in the production and selection of subjunctive mood in volitional clauses. Based upon previous studies on the subjunctive, as well as on adult and child HSs, it was predicted that participants in this study would produce and select the subjunctive more consistently with more-frequent lexical items. However, this result was not upheld, and there was no discernible role of lexical frequency. This is contra previous research as well as Putnam and Sánchez’s (2013) predictions, a point discussed at greater length below.

Together, these findings partially support Putnam and Sánchez’s (2013) account of HL acquisition and maintenance in the context of child HL acquisition. The effects for frequency of use of Spanish and for asymmetries between production and selection support these researchers’ framework. However, the positive role of age suggests that HSs do not reassemble the mood feature or experience greater difficulty mapping it onto morphological forms over time due to increased exposure to English. Rather, the data here point towards the protracted development of subjunctive mood. This finding is particularly surprising when considering that the DLI-7/8 group had experienced a drop in exposure to Spanish at school, yet still produced and selected more subjunctive mood when compared to the DLI-5 group that still received immersion in Spanish. This is contra what has been documented with younger HSs (Anderson, 2001; Merino, 1983; Silva-Corvalán, 2014). These findings do not preclude early attrition and subsequent reacquisition of subjunctive mood, but testing this possibility would require younger participants who may have found these tasks to be unwieldly lengthy. Furthermore, there was no role of lexical frequency in the present study, which does not align with Putnam and Sánchez’s (2013) predictions.

Considering these results, one possibility is that Putnam and Sánchez’s (2013) predictions run in reverse in the initial yet protracted development of Spanish morphosyntax. Specifically, HSs may develop stronger receptive knowledge before they reliably map syntactic forms onto morphology in language production. The rate of development may be modulated by patterns of exposure, as found in the present study and in Flores et al. (2018) in Portuguese. Recent research on children’s and adults’ acquisition of the differential object marker in Spanish (AUTHOR, XXXX, XXXX) has also advanced similar claims. Such a finding would align with Putnam et al. (2018), who assert that language dominance affects the degree of crosslinguistic influence in HL development. Individuals who have greater exposure consequently experience less crosslinguistic influence from English, so they may map the mood feature onto subordinate verbs earlier and with greater consistency than those children with lower exposure. Studies pointing towards protracted HL development continue to amass, so this explanation provides a possibly promising account for these findings. More research comparing children’s productive *and* receptive knowledge across a broader age range would be crucial to test this possibility.

This explanation does not incorporate lexical frequency, which is an important component of Putnam and Sánchez’s (2013) model. More data with child Spanish HSs are necessary to rule out frequency effects in child HL acquisition, but some speculations could account for the lack of frequency effects in the present study. Firstly, Giancaspro (2020) addressed lexical frequency as a categorical variable, while in the present study, this was addressed along a continuum, which may lead to a less pronounced outcome. Secondly, the previous study reporting frequency effects with verbal morphology in bilingual children incorporated only two verbs, so this may not have reflected the full distribution of the Spanish lexicon to which HSs are exposed (Goldin et al., 2023). These explanations seem implausible because previous studies have found that lexical frequency does account for adult HSs’ production and recognition of multiple morphosyntactic features even when addressed along a continuum (AUTHOR, XXXX; Hur, 2020; Hur et al., 2020; López-Otero, 2023).

In addition, it should be noted that while Putnam and Sánchez’s (2013) framework correctly predicted differences between individual HSs, the groups as a whole exhibited optionality in both tasks. This supports theories of HL acquisition that argue that as a group, HSs develop morphosyntactic systems that exhibit greater variability than would be found across speakers dominant in the same language (i.e., Montrul, 2008, 2009, 2013). In this vein, differences between HSs and other populations of Spanish speakers cannot be attributed solely to performative morphological variability in production. However, the individual analyses show that all HSs produced and recognized the subjunctive in at least two contexts, which suggests that this structure is not completely absent from any speaker’s grammar. Rather, most HSs experience persistently variable form-function mappings, which Lohndal and Putnam (2021) argue is typical in HL acquisition.

Before addressing limitations, it is important to contemplate the theoretical implications of the absence of the predicted effect for DLI on subjunctive mood knowledge. A widespread assumption is that DLI assures continued HL acquisition (i.e., Lindholm-Leary and Genesee, 2014, p. 169; Potowski, 2007a, p. 188), but this effect is not observed in this study. It is likely that factors beyond input quantity are necessary to support HL acquisition and maintenance. Firstly, it is possible that output is crucial for HL acquisition and maintenance, which aligns with recent research that has found that rates of output affect acquisition (Goldin, 2021; AUTHOR, XXXX). This is particularly plausible given that some DLI students reported never using Spanish at school. This aligns with previous research documenting frequent avoidance of Spanish even when receiving instruction in that language (Ballinger & Lyster, 2011; Hamman, 2018; Potowski, 2004). Moreover, Montrul and Perpiñán (2011) argue that explicit instruction provided advanced proficiency adult second language learners with an advantage in subjunctive knowledge over proficiency-matched HSs. Together, these findings along with those of the present study imply that simply overhearing Spanish is insufficient for acquiring less-frequent structures such as the subjunctive in contexts of HL acquisition, even in the case of DLI. Rather, output is a necessary ingredient of HL acquisition and maintenance, as in second language acquisition (Swain, 1993), and explicit instruction may be necessary to acquire some structures in bilingual contexts. The DLI environment could be conducive to greater output and more explicit instruction.

An additional consideration is the role of input providers in DLI programs. Teachers in some immersion programs (but not those with whom the DLI students in this study worked) are HSs or learners of Spanish themselves. Since these populations have been demonstrated to show variable knowledge of subjunctive mood, as reviewed previously, they could transmit a qualitatively different mood system to bilingual children. In future research on HL acquisition in DLI schools, it would be beneficial for teachers to complete the same tasks as a point of comparison.

Before concluding, it is critical to recognize key limitations. Firstly, the present study only used only canonical *–ar* verbs, yet Giancaspro et al. (2022) found that adult HSs are more likely to use the subjunctive with verbs with irregular subjunctive stems. While it is prudent to control morphological regularity for methodological reasons, such a decision may have undervalued HSs’ production and selection of the subjunctive in this study. Furthermore, while not the focal point of analysis, the strong intensional verb *creer* (*to believe*) could still imply contexts of doubt and consequently may have also inadvertently triggered subjunctive use in unexpected contexts.

Additionally, it may have been helpful to incorporate a group of bilingual children dominant in Spanish, as well as other age groups of bilingual children, to most fruitfully compare these populations. Another possibility is that the present study did not fully control for all possible contexts of HL use; this is particularly plausible considering the brevity of the language questionnaire. Most importantly, this study had a limited sample of bilingual children from only two schools, which required grouping seventh and eighth grade students into a single category. The absence of a statistically-significant effect for school type based upon observations in a single DLI program need not be taken as an argument against the effectiveness of bilingual education.

**7. Conclusion**

The present study concentrated on Spanish HSs’ acquisition of the subjunctive mood in volitional clauses using production and selection tasks. The finding that children improve in their command of subjunctive knowledge with age during the secondary school years and into adolescence is novel in research on the acquisition of this structure. The findings that patterns of HL use and HSs’ asymmetrical knowledge between production and comprehension align with Putnam and Sánchez’s (2013) activation-oriented account of HL acquisition. However, the finding that DLI did not have an impact on children’s acquisition of the Spanish subjunctive raises questions about the role of input and output quantity and quality in HL acquisition. Moreover, lexical frequency did not align with findings, contra Putnam and Sánchez’s (2013) predictions. Since children’s subjunctive knowledge increased with age, there was no evidence of feature reassembly or increasing optionality due to sustained activation of English. Rather, Putnam and Sánchez’s (2013) feature-oriented model that emphasizes patterns of exposure may also be relevant in the context of protracted development, a possibility that deserves further attention in future studies.

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Competing interests: The author(s) declare none.

1. Due to space limitations, readers are referred to Lindholm-Leary (2018) for further discussion of the premises and research concerning DLI education with Spanish HSs. [↑](#footnote-ref-1)
2. Following Cinque and Rizzi’s (2012) cartographic analysis, both Force and Fin are syntactic categories in the left periphery below the CP layer. [↑](#footnote-ref-2)
3. Recent research has shown that HSs are more likely to produce the subjunctive with irregular verbs (Giancaspro et al., 2022); the use of regular verbs is addressed as a limitation in the discussion of results in this paper. [↑](#footnote-ref-3)
4. Vannest et al. (2011, p. 2) define lemmatic/base frequency as “the frequency of the base morpheme, equivalent to the total frequency of all the words containing this morpheme.” The term *lexical frequency* is interchangeable with lemmatic frequency in this paper. [↑](#footnote-ref-4)
5. Note that in all of these sentences, the differential object marker *a* was omitted intentionally. [↑](#footnote-ref-5)
6. “Uncategorizable forms” were innovative inflections that are not a part of the Spanish inflectional system, and therefore, could not be placed into named categories. [↑](#footnote-ref-6)
7. The *geom\_jitter* layer was applied to this graph to slightly displace points along the *x* and *y* axes to enhance visibility. This is because if there are multiple participants with the same production and selection rates, only one point would be visible on the graph. Therefore, each of these points should be approximated to the nearest available integer. [↑](#footnote-ref-7)
8. This may appear counterintuitive; however, students’ frequent use of English during Spanish instructional time is well-documented (Ballinger & Lyster, 2011; Hamman, 2018; Potowski, 2004). [↑](#footnote-ref-8)
9. In Tables 6 and 7, “freq. of use” refers to the five contexts of language use targeted on the language questionnaire except for “at school,” which is represented separately to the right. [↑](#footnote-ref-9)