DUAL-LANGUAGE IMMERSION SCHOOLING AND THE ACQUISITION
OF THE SPANISH SUBJUNCTIVE IN SPANISH HERITAGE BILINGUALS

by

PATRICK D. THANE

A dissertation submitted to the
School of Graduate Studies
Rutgers, the State University of New Jersey
In partial fulfillment of the requirements
For the degree of
Doctor of Philosophy
Graduate program in Spanish
Written under the direction of
Jennifer Austin
And approved by

___________________________________

___________________________________

___________________________________

___________________________________

___________________________________

New Brunswick, New Jersey

May 2023
ABSTRACT OF THE DISSERTATION

Dual-Language Immersion Schooling and the Acquisition of the Spanish Subjunctive in Spanish Heritage Bilinguals

By PATRICK D. THANE

Dissertation Director:
Jennifer B. Austin, Ph.D.

The present dissertation brings together research on heritage language acquisition and bilingual education and makes inroads into the limited research on heritage language development in school-aged bilingual children. This study explores how bilingual education, patterns of exposure, and lexical frequency shape adolescent Spanish heritage speakers’ knowledge of the subjunctive mood, a complex grammatical structure. The exploration of factors such as these that can account for differences between heritage speakers or within a single speaker’s grammar has gained traction in adult research (see Giancaspro et al., 2022), but has yet to be systematically evaluated in children. Moreover, by comparing middle school children enrolled in a dual-language immersion school, in which children learn part of the curriculum in the heritage language, with those in a socioeconomically-matched English-only school, this dissertation takes a novel approach to studying the effects of educational context on heritage language development.

The subjunctive mood is a grammatical structure that has proven to emerge in a different (e.g., Montrul, 2009; Montrul & Slabakova, 2011) but highly systematic (e.g.,
Giancaspro, 2020; Giancaspro et al., 2022; Lustres et al., 2020; Perez-Cortes, 2021a, 2021b) way in Spanish as a heritage language. It is an ideal structure to test in the context of bilingual education precisely because monolingual children continue to acquire it into the school years (e.g., Ahern & Torrens, 2021; Blake, 1983; Dracos & Requena, 2022), and research on Portuguese has shown that quantity of input affects bilingual children’s acquisition of this structure into adolescence (Flores et al., 2017). Therefore, if schooling boosts exposure to the heritage language, dual-language immersion schools should facilitate children’s acquisition of input-sensitive structures such as the subjunctive that continue to be acquired around or past the start of the school period. The assumption that heritage speakers in dual-language immersion schools have an acquisitional advantage over peers in monolingual schools is widespread but untested (e.g, Lindholm-Leary & Genesee, 2014; Potowski, 2007b).

To address these opportunities for investigation, 93 participants carried out an elicited production task and a forced choice task assessing subjunctive mood in two syntactic contexts: volitional clauses following the verb querer (to want), which are acquired by age five (Blake, 1983; Dracos et al., 2019), and relative clauses, whose acquisition in monolingual populations is contingent upon Theory of Mind (Ahern & Torrens, 2021; Pérez-Leroux, 1998) and lasts beyond the beginning of the school period. Participants were divided into five groups: Spanish-dominant comparison adults ($n = 18$), seventh and eighth grade children in the immersion program ($n = 11$), seventh and eighth grade children in a monolingual school ($n = 23$), fifth grade children in the immersion program ($n = 19$), and fifth grade children in a monolingual school ($n = 22$). All child participants were heritage speakers of Spanish. This grouping of participants allowed for a
multiple baselines approach, through which the children were compared to an adult bilingual group that represented their input in Spanish, but also to one another at different age levels and in different contexts of exposure to the heritage language.

Results showed that all children used the subjunctive less than the adult comparison group. There were no statistically significant differences at the $p < .05$ level between the children in the immersion and monolingual school groups in either production or selection of the subjunctive mood in volitional clauses. There was a subtle yet significant advantage for the students in the immersion program in the selection of subjunctive mood in relative clauses, the later-acquired context, but this effect did not extend to production. However, all groups – including the adult baseline – used less subjunctive in relative clauses than in volitional clauses. Both groups of seventh and eighth grade children used more subjunctive mood in both contexts and across both tasks than the fifth grade groups, suggesting that bilingual children’s acquisition of this structure continues into the adolescent years. All children selected the subjunctive mood in both contexts more frequently than they produced it, which aligns with research on adult HS’ tendencies (Giancaspro & Sánchez, 2021; Sherkina-Lieber, 2015; Perez-Cortes, 2016). The frequency of verbs and home language exposure did not affect these results, although children’s self-reported use of Spanish had a subtle yet statistically significant correlation with use of the subjunctive.

These findings show that dual-language immersion does not automatically confer an advantage in bilingual children’s acquisition and mastery of complex grammatical structures such as the subjunctive mood. Although children’s use of the subjunctive increased with age, the present study does not align with prevalent assumptions in bilingual education research. Therefore, these results lay the foundation for future research on
pedagogies for teaching the heritage language in bilingual schools and for subsequent analyses of other areas of bilingual children’s inflectional systems. Furthermore, they show that some of the factors that affect adults – frequency of use and asymmetrical knowledge between production and comprehension – also affect older school-aged heritage speakers of Spanish.
ACKNOWLEDGEMENTS

The acknowledgements section of this dissertation cannot do justice to the great number of people who have gone into this effort. Dissertating has been, without a shadow of a doubt, the most personally challenging yet rewarding process that I have experienced. I am confident that carrying out this project has made me a better researcher, but more importantly, I have grown enormously as a thinker, an educator, and a person. Many people have been pivotal both throughout the eighteen months that I dedicated to this project as well as to the entirety of my experience at Rutgers. Hence, it is not possible to thank every person with whom I have crossed paths, but I would like to start by recognizing my parents. From the moments stretching back about twenty years ago when conventional schooling wasn’t working out for me to supporting me writing a dissertation in the midst of a pandemic, you have made my adventure possible. The conclusion of my studies is in no small way a fruit of your support and investment in my future. I am the luckiest son alive.

It goes without saying that working towards the completion of a doctoral degree requires collaboration and support. Firstly, my advisor and the chair of this dissertation, Jennifer Austin, has made a tremendous impact on my development as a researcher and as an academic. Not only has her positivity kept me motivated during the difficult moments, but she has helped me to craft two independent research projects and to learn each time from the process, and has supported my collaboration with other early career scholars who will be long my colleagues and friends. Liliana Sánchez inspired my passion for linguistic justice in the study of Spanish as a heritage language, and trained me in the tools necessary to make meaningful theoretical contributions to our field.
Joseph Casillas has pushed me to think about how to ask, answer, and reflect on my own questions, and has allowed me to become an independent researcher. Last but most certainly not least, Silvia Perez-Cortes and David Giancaspro have gone above and beyond in their roles as mentors. As Rutgers graduates themselves, they have set the bar high for me from very early on in my doctoral work. They represent what I strive to be as a researcher-educator, and their motivation and drive push me never to rest me on my laurels. I value them more than I can put into words.

Alongside my committee, Tom Stephens was my first official mentor at Rutgers, and I am grateful to him for his candid wisdom that has served me very well throughout my Ph.D. I am also grateful for the support from Héctor Álvarez, Carla la Torre, Luigi Laugelli, María Rivera, and Dena Russo for allowing me to collect data from their students. Of course, there were trials and tribulations to administering an experiment to many children, and I am grateful for my participants’ patience and perseverance in completing this study, particularly those who were not accustomed to using Spanish at school. Rosy Ruiz, Vivian Santamaria, and Jennifer Flaherty have supported me and all of my colleagues throughout our graduate careers and have steadied the ship during a worldwide pandemic, and they make our department a happy and productive place to work.

My motivations to pursue a doctorate owe their origins to fine educators throughout my childhood and adulthood. Allen Thomas brought passion into learning Spanish long before it interested me, and years later, James Johnson exposed me to a love of language and teaching. Without Regina Morin, I would not be the person and the linguist that I am. She introduced me to the study of language but also taught me the
ropes of being a passionate and diligent academic. She will be a lifelong friend and
mentor. Of course, I owe much to the many students of all ages and walks of life who
have challenged me to think about education and bilingualism, and to the other educators
who have sharpened my skills to be able to better serve the populations who ultimately
motivated me to pursue this project. In particular, I would like to thank Jean Wong, Aoife
Ahern, and Beatriz López-Medina for their support and kindness over the last years and
for their dedication to my development and success from both sides of the Atlantic. They
have taught me an enormous amount about teaching, language, and being a citizen of the
world.

I have met many people along the path at Rutgers, and it has been an absolute
pleasure to collaborate with Abril Jiménez, Michele Goldin, and Julio López Otero as
researchers and now as friends. Although we started as graduate student colleagues, you
have treated me as a peer while you were at Rutgers and after you began your careers.
Never did I expect to travel to Portugal and Spain together, but now I trust it is far from
our last adventure. I look forward to having you as some of my partners in academia and
to continuing to grow with all of you. Ariela Parisi has been a friend and a confidant
since our very first day in Rutgers, and Fran Centero has brightened my past two years in
the department. I deeply value my friendship with my colleague Gabriela Constantin-
Dureci, who has made me into a more critical thinker about language and equality. Above
all else, it has been a true pleasure to call Kyle Parrish my colleague, cohort mate, dear
friend, and travel partner. I know that our friendship, including with the family that he
has grown while at Rutgers, will withstand the test of time. I look forward to seeing you
at every stop of the conference road and to watching Virginia grow up!
Lastly, I have been fortunate to have met a number of people who have impacted me in my final year at Rutgers. It has been wonderful to have the support of Kendra Dickinson during the final months of my graduate career. Kendra’s kindness, enthusiasm, and energy has contributed enormously to my confidence and readiness as I face the challenges and excitement of academic life after Rutgers. Furthermore, the work I am doing with Susana Matos-Kruck as an educational consultant with Up the Bar Educational Achievement has both been rewarding and engaging at the professional level but has also given me new ways to bring research and practice together to foster linguistic and educational equality. I am grateful to my dear roommates at the 234 House who have been patient with me during the many hours of writing this dissertation yet eager to spend time and share many adventures together. Finally, the friendship that I have developed with my colleague, and, coincidentally, neighbor, Meritxell Feliu-Ribas, has been one of the highlights of my time at Rutgers, and I cannot wait to see all that she achieves over the next several years.

The conclusion of this process comes with mixed emotions: excitement for and apprehension about what comes next, as well as relief yet a sense of nostalgia to conclude what has been a consuming but altogether rewarding process. Although all of the people who have crossed my path along this road, or in the steps that led up to it, are too many to name, the experiences that I have had throughout the past four years have been special. I am eternally grateful for the lifelong friends, memories, and experiences that I take with me at the conclusion of this project and am confident that come what may, they will continue to shape me as a teacher, researcher, and person.
DEDICATION

For Jonathan and Walfer…

…and all of the other students just like you with whom I have worked and with whom I haven’t.

Espero que el trabajo que hago pueda, de alguna manera u otra, contribuir tanto a ustedes y los niños como ustedes (¡aunque no hay otros!) lo que me han contribuido a mí.
TABLE OF CONTENTS

ABSTRACT OF THE DISSERTATION ................................................................. ii
ACKNOWLEDGEMENTS .............................................................................. vi
DEDICATION ................................................................................................. x
LIST OF TABLES .......................................................................................... xvii
LIST OF FIGURES ....................................................................................... xix
LIST OF APPENDICES ................................................................................ xxii
LIST OF ABBREVIATIONS .......................................................................... xxiii

CHAPTER 1: INTRODUCTION ................................................................. 1
  1.1. Introduction ......................................................................................... 1
  1.2. Understanding Heritage Languages and Their Acquisition .......... 12
    1.2.1. Baselines .................................................................................. 14
    1.2.2. The Structure of Heritage Languages .................................... 16
  1.3. Theories of Heritage Language Acquisition ................................ 17
    1.3.1. Incomplete Acquisition and Attrition .................................. 18
    1.3.2. Input Quality Approach .......................................................... 22
    1.3.3. Activation Approach ............................................................. 25
    1.3.4. Summary of Theories of Heritage Language Acquisition .... 29
  1.4. Addressing Sources of Heritage Language Variability ............ 30
    1.4.1. Interface Variability ............................................................... 31
    1.4.2. Task Effects ........................................................................... 35
    1.4.3. Lexical Frequency ................................................................. 36
  1.5. Concluding Remarks ........................................................................ 41

CHAPTER 2: THE SUBJUNCTIVE MOOD IN SPANISH ....................... 44
  2.1. Introduction ......................................................................................... 44
  2.2. Overview of Subjunctive Mood ....................................................... 45
    2.2.1. Subjunctive Mood Morphology in Spanish ......................... 47
    2.2.2. Syntactic and Semantic Approaches to Subjunctive Mood .... 48
      2.2.2.1. Intensional Subjunctive .................................................. 52
      2.2.2.2. Polarity Subjunctive ....................................................... 55
    2.2.3. Mood in English and Crosslinguistic Influence ................... 58
    2.2.4. Summary ................................................................................. 61
  2.3. Research on the Acquisition of the Subjunctive Mood .............. 62
2.3.1. The Role of Dialectal Variation and Input Quality ........................................... 64
2.3.2. Monolingual Development of Subjunctive Mood ........................................ 66
2.3.3. Bilingual Childhood Development of Subjunctive Mood .................................. 70
2.3.4. Acquisition of Subjunctive Mood in Adult Spanish Heritage Speakers ............ 75
  2.3.4.1. Differences between Polarity and Intensional Subjunctive .............................. 76
  2.3.4.2. The Role of Modal Bases ........................................................................ 80
  2.3.4.3. Between-Speaker and Intraspeaker Variability ........................................... 82
  2.3.4.4. The Role of Crosslinguistic Influence ....................................................... 85
2.3.5. Summary of Findings in Acquisition ................................................................. 86
2.4. A Role for Bilingual Education ............................................................................. 88
2.5. Conclusion ............................................................................................................. 92
CHAPTER 3: BILINGUAL AND IMMERSION EDUCATION ........................................... 96
  3.1. Introduction ....................................................................................................... 96
  3.2. Introduction to Bilingual Education ................................................................ 99
  3.3. Academic and Cognitive Benefits of Dual-Language Immersion Education ..... 103
    3.3.1. Cognitive Development ............................................................................. 103
    3.3.2. Academic Development ........................................................................... 105
    3.3.3. Spanish Language Proficiency .................................................................. 110
    3.3.4. Sociocultural Factors ............................................................................. 113
    3.3.5. Special Education and Non-Traditional Learners ...................................... 115
    3.3.6. Summary of Findings ............................................................................. 116
  3.4. Language Development in Transitional Bilingual Education ......................... 118
  3.5. Language Development in Dual Language Immersion ..................................... 122
    3.5.1. Phonology ............................................................................................... 123
    3.5.2. Morphology ............................................................................................. 126
      3.5.2.1. Morphological Regularity .................................................................. 126
      3.5.2.2. Tense/Aspect Morphology .................................................................. 127
      3.5.2.3. Subjunctive Mood and Conditionals .................................................. 128
      3.5.2.4. Subject/Verb Agreement .................................................................... 129
      3.5.2.5. Gender Agreement ............................................................................ 130
    3.5.3. Syntax ...................................................................................................... 133
    3.5.4. Sociolinguistic Competence ..................................................................... 136
    3.5.5. Summary of Findings ............................................................................. 137
3.6.1. Contributions to Bilingualism Theory ........................................138
3.6.2. Contributions to Heritage Language Pedagogy ..........................140
3.7. Conclusion .....................................................................................141

CHAPTER 4: DISSERTATION STUDY ..................................................144

4.1. Introduction ..................................................................................144
4.1.1. Contributions to Heritage Language Acquisition Theory ........145
4.1.2. Contributions to Immersion and Bilingual Education ..........150
4.1.3. Contributions to Research on Subjunctive Mood .................151
4.2. Research Questions and Hypotheses .........................................154
4.2.1. Research Question #1 ............................................................154
4.2.2. Research Question #2 ............................................................157
4.2.3. Research Question #3 ............................................................159
4.2.4. Research Question #4 ............................................................162
4.3. Participant and School Characteristics ......................................163
4.3.1. Participants ............................................................................163
4.3.1.1. Fifth Grade Groups .........................................................166
4.3.1.2. Seventh and Eighth Grade Groups ................................168
4.3.1.3. Consistency across HS Participants .................................169
4.3.2. Schools ...............................................................................170
4.3.2.1. Immersion Charter School ............................................170
4.3.2.2. Monolingual School .........................................................174
4.4. Materials ....................................................................................176
4.4.1. Background Measures ..........................................................176
4.4.1.1. Language Questionnaire ...............................................176
4.4.1.2. Proficiency Measure ........................................................178
4.4.2. Experimental Tasks ...............................................................179
4.4.2.1. Elicited Production Task .................................................181
4.4.2.2. Forced Choice Task .........................................................184
4.4.3. Procedure ............................................................................187
4.5. Chapter Summary ......................................................................188

CHAPTER 5: DATA ANALYSIS AND RESULTS ............................191
5.1. Introduction ................................................................................191
5.2. Participant Statistics ................................................................192
5.2.1. Proficiency ..........................................................................192
6.2.2.1. Effects of Dual-Language Immersion ................................................. 239
6.2.2.2. The Role of Frequency of Use .......................................................... 246
6.2.2.3. Summary of Findings for Research Question #2 .................................. 247
6.2.3. Research Question #3 ........................................................................... 248
  6.2.3.1. Chronological Age ............................................................................. 248
  6.2.3.2. Immersion and Age ........................................................................... 249
  6.2.3.3. Commonality with Existing Research ................................................. 252
  6.2.3.3. Summary of Findings for Research Question #3 ................................ 255
6.2.4. Research Question #4 ........................................................................... 256
  6.2.4.1. Lexical Frequency .............................................................................. 257
  6.2.4.2. Task Asymmetries ............................................................................ 260
  6.2.4.3. Summary of Findings for Research Question #4 ............................... 263
6.3. General Summary of Findings .................................................................... 263
6.4. Revisiting Multiple Baselines ..................................................................... 265
6.5. Conclusion .................................................................................................. 266
CHAPTER 7: IMPLICATIONS, LIMITATIONS, AND CONCLUSION ...................... 269
  7.1. Introduction ............................................................................................... 269
  7.2. Contributions to Research on Spanish as a Heritage Language .................. 270
  7.3. Implications for Theories of Heritage Language Acquisition ..................... 273
    7.3.1. Incomplete Acquisition ....................................................................... 273
    7.3.2. Attrition .............................................................................................. 275
    7.3.3. Input Quality Approach ...................................................................... 277
    7.3.4. Activation Approach .......................................................................... 280
      7.3.4.1. Addressing Feature Reassembly ................................................... 281
      7.3.4.2. Lexical Frequency ......................................................................... 283
    7.3.4.2. Output .............................................................................................. 283
    7.3.5. General Discussion of Theories of Heritage Language Acquisition ......... 284
  7.4. Implications for Teaching the Partner Language .......................................... 286
    7.3.1. Implications for Bilingual Education Policy ......................................... 288
      7.3.1.1. Concentration of Partner Language Instruction ............................. 288
      7.3.1.2. Teacher Preparation and Language Proficiency ............................. 289
      7.3.1.3. Language Learning Objectives and Explicit Instruction ................. 290
    7.3.2. The Language Use Debate .................................................................... 291
    7.3.3. Pedagogies for Teaching Spanish as a Heritage Language in K-12 Settings 294
LIST OF TABLES

Table 1. Percentage of participants who used subjunctive mood in each context in Potowski (2007a, p. 151). ......................................................................................................................... 72

Table 2. Percentage of HS’ subjunctive production by context and proficiency in Perez-Cortes (2016). ................................................................................................................................. 81

Table 3. Percentage of subjunctive across conditions by adverbial item in Lustres (2018). ..................................................................................................................................................... 82

Table 4. Summary of groups of participants submitted to analysis. ......................... 169

Table 5. Background characteristics by participant group. ...................................... 170

Table 6. Descriptors for Likert scales for frequency of use on questionnaires.......... 177

Table 7. Verbs used in tasks by lemma frequencies in two language corpora........... 180

Table 8. Results of TOST for HS participants’ BESA proficiency scores. ............... 193

Table 9. Results of TOST for HS participants’ patterns of language exposure. ......... 194

Table 10. Results of TOST for HS participants’ frequency of HL use. ..................... 196

Table 11. TOST comparing subjunctive use by school across MLS-5 and MLS-7/8 groups................................................................................................................................. 197

Table 12. Innovative alternatives to subjunctive mood by number of responses. ...... 199

Table 13. Percentage of mood production and selection by group, task, and structure. 200

Table 14. Results of pairwise nested model comparisons for omnibus model. ......... 217

Table 15. Results of omnibus model........................................................................... 217

Table 16. Results of pairwise nested model comparisons for omnibus model. ........ 218

Table 17. Results of subjunctive mood model.............................................................. 219

Table 18. Tukey post-hoc pairwise comparisons of groups in omnibus model........ 220

Table 19. Results of refitted omnibus model with three-way group factor.............. 220
Table 20. Tukey post-hoc pairwise comparisons in refitted omnibus model by age group.

Table 21. Results of pairwise nested model comparisons for EPT model.

Table 22. Results of individual variability model.
LIST OF FIGURES

Figure 1. Kempchinsky’s (2009, p. 1798) structure of intensional subjunctive in Spanish. ................................................................. 54

Figure 2. Kempchinsky’s (2009, p. 1799) structure of polarity subjunctive in Spanish. 57

Figure 3. Iverson et al.’s (2008, p. 142) structure of mood in English for-to constructions. .......................................................................................................................... 60

Figure 4. Summary of methods of bilingual education in U.S. schools. ......................... 100

Figure 5. Average standardized test scores in English language achievement as reported in Marian et al. (2013, p. 175 and p. 177). ........................................................................................................ 107

Figure 6. Average standardized test scores in mathematics as reported in Marian et al. (2013, p. 175 and 177). ............................................................................................................................ 108

Figure 7. Cross-sectional oral proficiency results reported in Fortune and Tedick (2015, p. 648). .................................................................................................................................................. 112

Figure 8. Cross-sectional accuracy scores in production of English and Spanish reported in Merino (1983, p. 283). ....................................................................................................................................... 120

Figure 9. Cross-sectional accuracy scores in comprehension of English and Spanish reported in Merino (1983, p. 283). .................................................................................................................. 121

Figure 10. Structure of adult EPT. .......................................................................................... 182

Figure 11. Structure of child EPT. .......................................................................................... 182

Figure 12. Structure of adult FCT. .......................................................................................... 187

Figure 13. Structure of child FCT. .......................................................................................... 187

Figure 14. Results of TOST for differences between HS participant groups’ morphosyntactic proficiency. ................................................................................................................................. 193

Figure 15. Results of TOST for differences between HS participant groups’ patterns of exposure to Spanish. .............................................................................................................................. 195

Figure 16. Results of TOST for differences between HS participant groups’ frequency of use of Spanish. .............................................................................................................................. 196
Figure 17. Results of TOST for differences in average use of the subjunctive across students in the MLS groups in each school. ................................................................. 197

Figure 18. Production of indicative and subjunctive by group on FCT. .................. 201

Figure 19. Selection of indicative and subjunctive by group on FCT. .................... 202

Figure 20. Overall use of subjunctive by group on EPT and FCT. ......................... 203

Figure 21. Use of intensional/deontic subjunctive in volitional clauses by group and task. .................................................................................................................. 204

Figure 22. Use of polarity/epistemic subjunctive in relative clauses by group and task. .................................................................................................................. 204

Figure 23. Production of subjunctive by type (volitional/relative clauses) and group on EPT. ............................................................................................................. 206

Figure 24. Selection of subjunctive by type (volitional/relative clauses) and group on FCT. ............................................................................................................. 207

Figure 25. Percentage of subjunctive use by HS participant as a function of frequency of use. ........................................................................................................... 208

Figure 26. Percentage of subjunctive use in volitional clauses by HS participant as a function of frequency of use. ........................................................................ 209

Figure 27. Percentage of subjunctive use in relative clauses by HS participant as a function of frequency of use. ........................................................................ 210

Figure 28. Percentage of subjunctive in volitional clauses by verb on EPT (organized from most to least frequent) ........................................................................ 210

Figure 29. Percentage of subjunctive in relative clauses by verb on EPT (organized from most to least frequent) ........................................................................ 211

Figure 30. Percentage of subjunctive in volitional clauses by verb on FCT (organized from most to least frequent) ........................................................................ 211

Figure 31. Percentage of subjunctive in relative clauses by verb on FCT (organized from most to least frequent) ........................................................................ 212

Figure 32. Effect of lexical frequency as a categorical variable by group in EPT. ...... 213

Figure 33. Effect of lexical frequency as a categorical variable by group in FCT. ...... 214
Figure 34. Forest plot summary of omnibus model. ............................................................... 217

Figure 35. Forest plot summary of omnibus model. ............................................................... 219

Figure 36. Forest plot summary of model for age groups....................................................... 221

Figure 37. Forest plot summary of individual variability model. ......................................... 223

Figure 38. Individual subjunctive production and selection by participant and group. 225

Figure 39. Correlations between subjunctive production and selection by group. ....... 226

Figure 40. Percentage of subjunctive mood in relative clauses by SDB participant. .... 237
**LIST OF APPENDICES**

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Previous Research on the Acquisition of Subjunctive Mood in Spanish as a Heritage Language</td>
</tr>
<tr>
<td>B</td>
<td>Previous Research on the Acquisition of Spanish in Dual-Language Immersion</td>
</tr>
<tr>
<td>C</td>
<td>Transcript of Language Use Questionnaire</td>
</tr>
<tr>
<td>D</td>
<td>Transcript of Children’s Elicited Production Task</td>
</tr>
<tr>
<td>E</td>
<td>Transcript of Full Elicited Production Task</td>
</tr>
<tr>
<td>F</td>
<td>Transcript of Children’s Forced Choice Task</td>
</tr>
<tr>
<td>G</td>
<td>Transcript of Full Forced Choice Task</td>
</tr>
</tbody>
</table>
# LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Long form</th>
</tr>
</thead>
<tbody>
<tr>
<td>DLI</td>
<td>Dual-language immersion</td>
</tr>
<tr>
<td>DOM</td>
<td>Differential object marking</td>
</tr>
<tr>
<td>ELL</td>
<td>English language learner</td>
</tr>
<tr>
<td>EPT</td>
<td>Elicited production task</td>
</tr>
<tr>
<td>FCT</td>
<td>Forced choice task</td>
</tr>
<tr>
<td>HL</td>
<td>Heritage language</td>
</tr>
<tr>
<td>HS</td>
<td>Heritage speaker</td>
</tr>
<tr>
<td>L1</td>
<td>First/native language</td>
</tr>
<tr>
<td>L2</td>
<td>Second language</td>
</tr>
<tr>
<td>L2L</td>
<td>Second language learner</td>
</tr>
<tr>
<td>MLS-5</td>
<td>Monolingual school fifth grade group</td>
</tr>
<tr>
<td>MLS-7/8</td>
<td>Monolingual school seventh and eighth grade group</td>
</tr>
<tr>
<td>OWI</td>
<td>One-way immersion</td>
</tr>
<tr>
<td>PI</td>
<td>Processing Instruction</td>
</tr>
<tr>
<td>SDB</td>
<td>Spanish-dominant bilingual</td>
</tr>
<tr>
<td>SES</td>
<td>Socioeconomic status</td>
</tr>
<tr>
<td>TWI</td>
<td>Two-way immersion</td>
</tr>
<tr>
<td>DLI-5</td>
<td>DLI school fifth grade group</td>
</tr>
<tr>
<td>DLI-7/8</td>
<td>DLI school seventh and eighth grade group</td>
</tr>
</tbody>
</table>
CHAPTER 1: INTRODUCTION

1.1. Introduction

The development and maintenance of heritage languages (HLs) has been an important topic in bilingualism research. HLs are acquired early in life as native languages (L1) but develop in a contact situation alongside a language with greater social presence. In many cases, the latter superimposes itself on the HL, causing a shift in dominance around the beginning of schooling. HLs have become particularly important in bilingualism research because their development represents a unique situation of L1 acquisition, since, unlike in monolingual contexts, there is a full spectrum of possibilities ranging from limited or passive command of the HL to full competence that resembles that of monolingual speakers. HLs have therefore garnered substantial attention and comprise an important subfield of bilingualism that has focused on the factors that shape their myriad possible acquisitional outcomes (for reviews of HL research, see Montrul, 2016; Polinsky, 2018; Montrul & Polinsky, 2021).

To date, Spanish has been the most researched HL, as there are approximately 57.5 million Americans of Hispanic descent (United States Census Bureau, 2017). The number of Spanish speakers in the United States eclipses the population of all Spanish-speaking countries except for Mexico (Noe-Bustamante, 2019) and represents approximately three of every five Americans who are bilingual (Nangano, 2015). However, English remains the language of public institutions. Studies have demonstrated a transgenerational shift in Spanish spoken in the United States (i.e., Silva-Corvalán, 1994a; Zentella, 1997), and research on the morphology and syntax of Spanish as a HL
has documented the ways in which HS differ from other monolinguals and bilinguals (see Potowski, 2018 for a survey of research on Spanish as a HL).

As this dissertation will address HL acquisition, it is essential to provide a definition of who speaks heritage varieties of a language. Achieving a single definition of who constitutes a heritage speaker (HS) has not been straightforward. Polinsky and Kagan (2007) propose narrow and broad definitions of HS. The broad definition of HS includes those individuals who speak a language of their cultural heritage as well as those who learn this language later in life after the L1 acquisition years. While this description is maximally inclusive from the perspective of cultural identity, it may not be as precise for bilingualism research: this definition would include speakers who have no childhood exposure to their HL, and who therefore would approach its acquisition with the same learning needs as other second language learners (L2L). In contrast, Polinsky and Kagan’s narrow definition is that HS are native speakers of a language that is not spoken by the broader social community. Crucially, these bilinguals receive some degree of exposure in early life to the HL at home from their family.

Even in alignment with Kagan and Polinsky’s (2007) narrow definition, HS represent a highly heterogeneous group. Different ages of acquisition of the socially-dominant language, proficiency levels, and patterns of use of and exposure to the HL can lead to a wide spectrum of possible outcomes. Therefore, HL acquisition research faces three tasks. The first is to document and understand the structural changes that give shape to heritage varieties of languages. The second is to propose theories that can accommodate the wide spectrum of outcomes of HL acquisition and to explore how these theories contribute to our broader knowledge of bilingualism and language acquisition.
Lastly, the third is to address how HL acquisition research can inform fields such as language policy, education, and social justice for multilingual people (Ortega, 2020; Skutnabb-Kangas, 2005, 2006), as bilingualism is tied to speakers’ identity and ability to communicate with members of their community.

As Montrul (2013, 2018) discusses, most knowledge of HL acquisition stems from studies with adults. The study of bilingual children is essential for broadening our understanding of HL acquisition, and one additional factor that may shape linguistic development is education. The vast majority of schools in the United States only teach content in English (American Councils for International Education, 2021), which represents a subtractive or deficit approach to bilingualism (Lambert, 1977). Therefore, the beginning of schooling in the United States usually results in a period in which HS encounter a drastic reduction in use of and exposure to the HL and when they begin to develop greater strength in English (Wong-Fillmore, 1991). The emphasis on English also implies that HS may not develop literacy skills or academic registers in their HL, which may further contribute to differences in their grammatical knowledge when compared to other populations of speakers (Kupisch & Rothman, 2018). Therefore, it is plausible that education confers an opportunity to cultivate its development of the HL through continued exposure and by exposing HS to academic registers. Despite the uniqueness of the context of bilingual education for studying HL development, few studies have done so, so the present study makes important inroads into comparing children in monolingual and bilingual schools in order to understand the impact that education has on language development.
This dissertation makes a contribution to each of the three goals of HL research described above by addressing HL development in contexts of bilingual and monolingual education. With regards to the first goal of HL acquisition research described above, documenting the nature of HLS, I address the acquisition of the Spanish subjunctive mood, a grammatical property that, due to its complexities, has been the topic of substantial research. To date, dozens of studies have concentrated on the acquisition of the Spanish subjunctive in adult HS (e.g., Giancaspro, 2019, 2020; LaCasse, 2018; López-Beltrán Forcada, 2021; Lustres et al., 2020; Mikulski, 2010; Montrul, 2007, 2009; Montrul & Perpiñán, 2011; Pascual y Cabo et al., 2012; Perez-Cortes, 2016; van Osch et al., 2017, 2018; van Osch & Sleeman, 2018; Viner, 2018), monolingual children (Ahern & Torrens, 2021; Blake, 1983; Dracos et al., 2019; Pérez-Leroux, 1998; Sánchez-Naranjo & Pérez Leroux, 2010), and L2L (e.g, Amenós-Pons et al., 2019; Borgonovo et al., 2015; Fernández-Cuenca & Jegerski, 2022; Gudmestad, 2014; Isabelli, 2007; Iverson et al., 2008; Kanwit & Geeslin, 2018; Montrul & Perpiñán, 2011; van Osch et al., 2018). The subjunctive has also been the topic of research in HL pedagogy (Bowles, 2021; Fernández-Cuenca & Bowles, 2022; Potowski et al., 2009) and bilingual specific language impairment (Castilla-Earls et al., 2018, 2021). However, few studies have investigated neurotypically developing1 child HS’ knowledge of subjunctive. Merino (1983) and Potowski (2007a, 2007b) have briefly explored the development of mood morphology in larger-scale analyses of bilingual children, but Dracos and Requena

1 Because it is important to recognize that every child approaches the bilingual acquisition process with a slightly different profile, I clarify that in this instance, I use typical development to refer to those individuals who do not have diagnosed specific language impairment.
(2022) are the only researchers to investigate the development of the subjunctive in school-aged HS children. However, their study had very few older children and did not concentrate on bilingual education, leaving these areas open for future research.

This study contributes to the second goal of HL acquisition in two ways. Firstly, I investigate on fifth and eighth grade HS. Because dual first language acquisition research generally concentrates on young children, and HL research usually focuses on adults (Kupisch & Rothman, 2018; Montrul, 2012), the present study contributes much-needed knowledge concerning bilingual development in the pre-adolescent to adolescent years. In turn, this contributes to knowledge of how HLs develop and change across the lifespan, which enriches our knowledge of how education contributes to bilingualism more generally.

Secondly, I take an underused approach to explore how bilingual education can affect HL development. Fortunately, dual-language immersion (DLI) is a method of education that offers HS continued exposure to the HL. In particular, English-Spanish immersion education is growing in popularity in U.S. public schools, both as a solution for providing HS with sustained exposure to their HL and, in some instances, for offering L2L the opportunity to develop bilingual skills. Hispanic youth are 1.5 times less likely to graduate from high school than the national average (National Center for Educational Statistics, 2019); however, research on immersion has shown that Hispanic students in these programs obtain higher grade point averages and are less likely to drop out of high school (Christian et al., 2004; Thomas & Collier, 2002). As I will discuss at greater length in Chapter 3, DLI leads to favorable academic, sociocultural, and cognitive outcomes (see Lindholm-Leary, 2016, 2018 for recent overviews of research). However,
there is still a lack of studies using experimental methods from formal linguistics that have investigated how sustained exposure to Spanish impacts child HS’ development and maintenance of their HL under different contexts of exposure.

There has been a small but impactful number of studies that have indirectly evaluated the role of formal instruction in the HL, although none has focused on Spanish in the United States. These studies, as cited by Kupisch and Rothman (2018), provide indirect evidence in favor of sustained bilingual education by comparing speakers of different HLs living in Germany with differences in access to bilingual education. On one hand, a series of studies showed that adolescent French HS living in Hamburg, Germany and attending a French high school patterned similarly to a mirror group of German HS living in France in their knowledge of gender agreement and assignment (Kupisch et al., 2013), adjective placement (Kupisch et al., 2014), the use of definite articles with generic plural determiner phrases (Barton, 2015), and voice onset time of the plosive consonant /k/ (Lein et al., 2016). However, in comparison studies evaluating the same phenomena, Italian HS living in Germany who did not receive extensive formal education in their HL showed considerable variability, particularly in the use of definite articles with generic plural determiner phrases and in voice onset time, when compared to Italian-dominant German HS (Barton, 2015; Bianchi, 2013; Kupisch, 2012, 2014).

These studies argue convincingly that a primary and secondary education in the HL has important implications for its development. However, there are two important considerations that form the foundation for future research, such as the project undertaken in this dissertation. Firstly, Kupisch and Rothman (2018) recognize that the sociolinguistic and socioeconomic circumstances surrounding English-Spanish bilinguals
in the United States often differ substantially from those of the participants in their study, which could have a high impact on the development of the HL. Furthermore, neither set of studies carried out by Kupisch and colleagues evaluates language development in speakers of the same two languages in two distinct educational contexts (e.g., the French speakers attended a bilingual school in Germany, while the Italian speakers attended a monolingual school in Germany). The sociolinguistic circumstances of contact between European languages may also differ substantially from those of Spanish in contact with English in the United States, a nation that historically has endorsed subtractive approaches to bilingualism and bilingual education (see Lindholm-Leary, 2016).

This leads to the contributions of this dissertation to the third goal of HL research: by investigating language development in an immersion school, the results from the present dissertation have the potential to inform our knowledge of the effectiveness of this method of bilingual education from a novel perspective. There is very little knowledge of how sustained instruction in Spanish translates into acquisition of the HL, which reinforces the need for studies such as the one that I take up here. Furthermore, understanding which components of grammar students develop and which require additional support through specific and direct instruction allows teachers and administrators to formulate language learning objectives for their students. In addition, research on language development in bilingual education is impactful for refining pedagogical practices and focusing on long-term development of bilingualism and biliteracy initiatives for Spanish HS. Therefore, although this dissertation uses methods from linguistic research, it has interdisciplinary implications for bilingual education,
educational policy, and linguistic justice for speakers of HLS, and a considerable portion is dedicated to addressing these topics, particularly in Chapters 3 and 7.

In this project, I compared four groups of children with distinct educational experiences: fifth-grade students actively enrolled in a bilingual immersion school, seventh and eighth grade children who graduated from the same immersion program two to three years prior, and groups of fifth and seventh and eighth graders enrolled in a traditional monolingual school. All HS groups are also compared to a group of Spanish-dominant bilingual (SDB) adult participants. This design allows for a meaningful investigation into the impact of sustained exposure to Spanish at school during the childhood years on the subjunctive, which has proven to be sensitive to frequency of use and exposure (Dracos & Requena, 2022; Flores et al., 2017; Perez-Cortes, 2016). It also is a multiple baselines study whereby HS are evaluated not only relative to a non-heritage norm but also to one another in groups who differ in age and educational exposure to the HL. As I will discuss in the following sections of Chapter 1, comparing different populations of HS to one another and to a group of SDB has not been frequent in bilingual education research, yet this approach is imperative for highlighting the influence of bilingual education on HL acquisition and maintenance.

Participants completed a production task followed by a receptive forced choice measure to select between the subjunctive and more-frequent indicative moods (Biber et al., 2006; Kanwit & Geeslin, 2018), because performative difficulties in production may not be a true reflection of HS’ underlying grammatical knowledge (Perez-Cortes et al., 2019). The four research questions that guide my project center around the importance of educational experience and home exposure to Spanish, differences between production
and underlying receptive knowledge, and the frequency of individual words on HS’ use of the subjunctive mood in two contexts. The first context, in volitional clauses following the verb *querer*, has proven to be less difficult for HS to master than the second, in object relative clauses (e.g., Giancaspro, 2017; Montrul, 2007, 2009; van Osch et al., 2018). Monolingual children also acquire the subjunctive in volitional clauses before its use in relative clauses (Ahern & Torrens, 2021; Blake, 1983; Dracos & Requena, 2022), whose development may take place after schooling has already begun. Therefore, the late acquisitional timeline of subjunctive mood, including in monolingual populations but especially in bilingual children, makes it an ideal testing ground for how added exposure through education can shape HL acquisition.

The first research question addressed the differences between HS and SDB, as well as differences in the use of the subjunctive in volitional and relative clauses. A logical hypothesis based on the research briefly referenced above related to the acquisition of the subjunctive mood is that SDB would produce and select this structure more frequently than HS, especially in relative clauses, and that HS would produce and select the subjunctive more frequently in volitional clauses following *querer* than in relative clauses.

The second research question concerned the impact of DLI schooling and frequency of use of Spanish on the use of the subjunctive. I hypothesized that immersion schooling and frequency of use of Spanish across six contexts would affect HS’ use of subjunctive mood. Specifically, I predicted that participants enrolled in the bilingual school and those who reported the most frequent use of Spanish would produce and select
the subjunctive more frequently than those in the monolingual school and those with lower frequency of use of the HL.

In the third research question, I addressed whether chronological age influenced the use of the subjunctive. As I will discuss in §2.3.3, there is mixed evidence concerning the role of chronological age on the acquisition of subjunctive mood in Romance languages (Dracos & Requena, 2022; Flores et al., 2017), evidence points towards a relationship between patterns of exposure and age: HS who have more exposure to the HL produce the subjunctive mood earlier in childhood; those with less exposure can continue to develop this structure into adolescence. Since HS in immersion schools receive more exposure and may as a result have already acquired the subjunctive by fifth grade, a plausible hypothesis was that age would not affect HS in immersion schools, while HS in a monolingual school would show age effects. Therefore, I predicted that the HS in the DLI school would produce similar levels of subjunctive mood in both fifth and seventh and eighth grades, but that HS in the monolingual school would show an increase in subjunctive use with age.

Finally, the fourth research question addressed which variables can affect a single speaker’s knowledge of subjunctive mood. I return to a more precise theoretical rationale for this question in the latter sections of this chapter, specifically in §1.4. Specifically, I address whether child HS’ knowledge of mood is conditioned by the type of task – production versus selection – and the frequency of individual verbs. Some linguistic theories predict that speakers with the most exposure to Spanish are least affected by these factors (Putnam & Sánchez, 2013), as discussed in §1.3.3. Therefore, I hypothesized that there would be a relationship between patterns of exposure, understood
as differences in educational experience, on the impact of these two variables on speakers’ knowledge of mood. Specifically, I predicted that children in a bilingual immersion school would not show differences between their productive and receptive knowledge of mood and would not show effects of lexical frequency, while children with less exposure in a monolingual school would. I return to each of these questions and offer more explicit hypotheses and predictions in Chapter 4.

This dissertation is divided into seven chapters. In the rest of Chapter 1, I introduce HL research with particular focus on theories of acquisition and on the multiple factors that appear to be the sources of variability in HS’ grammars. In Chapter 2, I present the theoretical accounts of subjunctive mood and review previous research on its acquisition by monolingual children and by Spanish HS. Chapter 3 concentrates on the educational, psychological, and linguistic benefits of immersion schooling and the importance of conducting research on language development in bilingual schools. In Chapter 4, I offer a more thorough overview of my research questions, methods, participants, and predictions. Chapter 5 contains the statistical analyses and results of this study. In Chapter 6, I discuss these results and how they answer my research questions. Finally, in Chapter 7, I return to discussions of HL acquisition theory, educational policy, and HL pedagogy based upon my findings, and address the limitations of this dissertation. In the remaining sections of this chapter, I provide readers with a more meaningful understanding of HL acquisition theory and of what factors can allow us to capture variability in HS.
1.2. Understanding Heritage Languages and Their Acquisition

Before discussing the theories of how HLs develop and change, it is important to understand the factors that give rise to their acquisition. Research has shown that age at the beginning of the acquisition of the socially-dominant language, cumulative and current exposure, and proficiency (overall command of vocabulary and grammar) impact the course of HL acquisition. Of importance is that HS are early bilinguals, as their exposure to the HL ensues at birth and they begin bilingual development in early to middle childhood. Although age of onset of acquisition might best be understood as situated along a continuum (Ortega, 2020), HS’ early development of bilingualism contrasts with L2L, who are late bilinguals, because they begin developing their L2 later in childhood or adulthood (e.g., Montrul, 2012, 2016).

An important part of our understanding of HLs is recognizing that HS are distinct from other populations of bilinguals and monolinguals. Research in psycholinguistics has consistently demonstrated that bilinguals activate both of their languages during speech and comprehension (e.g., Abutalebi & Green, 2007; Dijkstra, 2005; Goral et al., 2006; Kroll & Bialystok, 2013; Marian & Spivey, 2003; Sunderman & Kroll, 2006; van Heuven et al., 2008). Therefore, as Grosjean (1989, 2012) describes, bilingual speakers consistently coactivate their two languages, and thereby these languages continuously affect and interact with one another. There is ample evidence that even bilinguals with high levels of proficiency in and frequency of use of two typologically-similar languages show subtle but systematic grammatical differences when compared to monolinguals (take, for example, recent research on Spanish-Catalan bilinguals, such as Ahern et al.,
Because the constant influence or transfer from a stronger language often maps itself onto the weaker one, perhaps a more logical approach to understanding HL acquisition would be to address how HS compare to L2L (see Montrul, 2012 for a more detailed analysis), but research has shown that these two groups are also considerably different from one another. As mentioned, by definition, L2L are older than HS when they begin acquiring their L2, while HS and monolinguals share the fact that they are native speakers (Rothman & Treffers-Daller, 2014). Generally, results from studies comparing HS and L2L show that language acquisition experience affects the nature of these groups’ grammatical knowledge. HS are generally more precise on linguistic tasks that focus on implicit knowledge, oral production, and processing of the language (e.g., Alarcón, 2011; Bowles, 2011; Montrul et al., 2013; van Osch et al., 2018). In contrast, L2L appear to have an advantage over HS in written measures and when carrying out linguistic tasks that focus on explicit knowledge, such as untimed grammaticality judgments. This likely is attributable to the fact that L2L often receive explicit form-focused instruction and have more balanced oral and written exposure to their L2, which could lead to higher metalinguistic awareness, while HS often do not have opportunities to develop literacy or academic registers in their HL.

What such findings suggest is that HS may possess grammatical competence that is closer to monolingual speakers in certain areas than L2L, as exhibited through their advantages concerning processing tasks and implicit knowledge, but this may not translate into better performance on some experimental tasks due to the nature of the
methodologies that we use to assess these populations. In addition, as discussed throughout the following sections, HS’ linguistic knowledge is more similar to monolinguals in some areas of grammar, while performance may be more similar to L2L in other domains. Therefore, HS are best understood as a unique group of bilingual speakers as well as of native speakers, which underscores the importance in addressing how and to whom we should compare these speakers, if such comparisons are necessary at all (see Rothman et al., 2023).

1.2.1. Baselines

As Polinsky (2018) describes, research on HL acquisition generally establishes a baseline group as a point of comparison. Ideally, this represents a population of speakers from whom HS acquire their HL. Some research has sought to establish the differences between heritage and monolingual speakers of a given language. While this approach allows researchers to maximally expose the differences that emerge in heritage varieties, it has been met with some criticisms. Firstly, Pires and Rothman (2009b) argue that evaluating groups of monolingual speakers may have the unintentional consequence of reinforcing the prestige of prescriptive or standardized dialects, while simultaneously devaluing bilingual varieties. Additionally, as Pascual y Cabo and Rothman (2012) describe, comparing monolinguals and HS overlooks the fundamental differences between monolingualism and bilingualism described above.

As an alternative, Pascual y Cabo and Rothman (2012) call for comparing HS with other bilingual speakers. Multiple studies have incorporated groups of SDB who

---

2 As cited above, Rothman et al. (2023) argue that even the use of bilingual control groups can have the effect of creating a deficit perspective of bilingualism
receive most or all of their primary education in a monolingual context and who later acquire a second language; these individuals are therefore frequently the parents or grandparents of HS. Spanish-dominant bilinguals may experience changes in their grammars, as they also encounter the effects of coactivation of their two languages on a more regular basis. Because Spanish-dominant bilinguals are late L2L of the socially prevalent language, they represent the “mirror image” of HS. Because they are immersed in a location where the L2 is more socially prevalent, their L1, despite being dominant, could experience contact-induced change. Therefore, using a bilingual comparison group in HL research has two advantages: firstly, bilingual adults are frequently the caregivers who provide input to HS, and may be HS themselves, so this approach more directly traces the exposure that HS receive in Spanish; secondly, incorporating two populations with exposure to the same languages is a superior approach because it eliminates the confound between what emerges in heritage varieties only from what are general effects of being bilingual.

A third approach to establishing a baseline in HL research that may prove most useful in research on bilingual children is to compare HS to one another. Although this approach has been less utilized in research on adult HS, a useful avenue for exploring the effects of sustained exposure through bilingual immersion education is to compare similar childhood populations enrolled in different types of schools. Needless to say, these approaches are not mutually exclusive, such that it is possible to make comparisons across multiple baselines, as I do in this dissertation.

What is evident across research that has used each one of these approaches is that HS appear to acquire some structures in a way that more closely resembles monolingual
baselines than others. Recent surveys of research have compared HS of multiple languages, and their findings have revealed commonalities in the ways that heritage varieties differ from those found in monolingual communities. In the following section, I discuss the general commonalities that have emerged across the amassing research on HL acquisition.

1.2.2. The Structure of Heritage Languages

Certain areas of heritage grammars appear to be more likely to experience change than others, as evidenced by similarities across heritage varieties of typologically distinct languages (see Polinsky & Scontras, 2020 for a discussion of commonalities across HLs). Generally, phonology is the area of HLs in which differences between HS and monolingual speakers are typically least evident (e.g., Au et al., 2002; Knightly et al., 2003). HS also generally pattern with other groups of native speakers in their command of foundational elements of syntax such as word order, while they show greater variability in structures that involve the overlap between syntax and semantics or that rely on layers of pragmatic processing (e.g., Chamorro & Sorace, 2019; Sorace, 2000, 2005, 2007, 2011; Sorace & Filiaci, 2006; Sorace & Serratrice, 2009; Tsimpli & Sorace, 2006). In line with previous research on L2 acquisition (e.g., Jensen et al., 2020; Slabakova, 2013, 2019a) that has been extended to HL acquisition (see Montrul, 2011a, 2018; Slabakova, 2019b), inflectional morphology has been termed the “bottleneck” of language acquisition because it interacts with semantics, syntax, and phonological form. As Polinsky and Scontras (2020) argue, the syntactic dependencies and form-function mappings involved in morphological inflections across HLs make them an area of
grammar that is particularly challenging to master and that often exposes differences between HS and speakers of non-heritage varities.

Despite these generalizations, many HS still present phonological differences from monolinguals (to name a small host of examples in Spanish as a HL, see Alvord & Rogers, 2014; Amengual, 2012; Casillas & Simonet, 2018; Kim, 2011, 2015, 2020), while others show robust knowledge of pragmatically-driven structures (see Leal Méndez et al., 2015). Therefore, these claims are generalizations about speakers’ grammatical knowledge. Within the multiple layers of their grammar, HS exhibit grammatical tendencies that are subject to nuanced variation within a single speaker and that exhibit systematic differences when compared to monolinguals. As a result, there is a great variety of possible outcomes in HL acquisition, such that research has sought to establish theories that can capture the multiple acquisitional patterns of HS. In the following section, I review the theories of HL acquisition that have been most prominent in this line of research and describe the evidence supporting each of them.

1.3. Theories of Heritage Language Acquisition

Work on HL acquisition has most generally been situated within one of three theoretical frameworks: representational deficits approaches known as incomplete acquisition (e.g., Domínguez, Hicks, & Slabakova, 2019; Montrul, 2002, 2008, 2013) and attrition (e.g., Hicks & Domínguez, 2020; Köpke, 2007; Polinsky, 1997, 2011, 2018; Schmid & Köpke, 2017), input quality approaches (e.g., Pires & Rothman, 2009; Pascual y Cabo & Rothman, 2012), and the activation approach (Putnam and Sánchez, 2013; Putnam et al., 2019). While it is generally understood that there is tension between these theories and that they provide competing accounts concerning the source of the
heterogenous nature of heritage bilingualism, there is some common ground among them.

As López-Beltrán Forcada (2021, pp. 4-5) describes:

It is important to note that the approaches discussed here are neither mutually exclusive nor inherently ‘correct’ or ‘incorrect.’ While it is true that some of them have elicited more debate than others, achieving a unified theory of HL acquisition and processing requires a certain degree of common ground between all of these approaches.

In the following section, I provide a review of these theoretical models, as well as of the research conducted to date that has supported each of them.

1.3.1. Incomplete Acquisition and Attrition

Accounts of representational deficits posit that HS’ linguistic knowledge is less developed than that of monolingual speakers. There are two accounts of representational deficits, one that describes the arrested development of the HL, and the other that refers to language loss. In the strictest sense, incomplete acquisition and attrition appear to be permanent descriptions of the state of speakers’ grammar (but see Schmid et al., 2013 for a counter-perspective), but they may co-occur within the same speaker and even with the same grammatical structure (that is, partial development and subsequent loss is possible; see Cuza et al., 2013 for an example).

Some previous studies have claimed that, owing to lower amounts of exposure to the L1 than monolingual speakers, HS experience incomplete acquisition of morphological and syntactic properties. Research on Spanish as a HL has suggested that incomplete acquisition can account for HS’ different patterns of use of gender agreement morphology (Alarcón, 2011; Montrul et al., 2008), differential object marking (herein, DOM; Montrul & Bowles, 2009; Montrul & Sánchez-Walker, 2013; Montrul et al.,
2015), the preterit-imperfect aspectual contrast (Montrul, 2002), and subjunctive mood (Montrul, 2007, 2009; Montrul & Perpiñán, 2011).

In some studies that have been interpreted as evidence for this framework (e.g., Montrul, 2002; Montrul & Sánchez-Walker, 2013; Montrul et al., 2015), researchers have divided HS into two subgroups based upon the age range at which they began to receive exposure to English. On one hand, HS who begin acquiring the socially prevalent language around the onset of schooling are *sequential bilinguals*, as they receive exposure to the HL in a monolingual home setting before the educational language is introduced. In contrast, children who receive exposure to two or more languages from birth have been called *simultaneous bilinguals*, as they have exposure in early childhood to two L1s, one of which is the socially prevalent language and the other which often becomes a HL (see de Houwer, 2009 or Meisel, 1994 for overviews of bilingual first language acquisition). Because simultaneous HS have early exposure to both languages, they are native speakers of both. In contrast, sequential HS are L2L of the more socially prevalent language, even though it frequently supplants their L1 as dominant.

Although researchers on this topic do not make explicit predictions concerning the connection between age of acquisition and the extent of incomplete acquisition, it can be extrapolated that these researchers posit that sequential bilinguals would plausibly show greater command of morphosyntactic properties because of their cumulatively greater input in the HL and the period of monolingualism that they experience. Kupisch and Rothman (2018, p. 569) describe the rationale for why age of acquisition of the socially-dominant language has important implications for HL development:

“With simultaneous exposure from birth HL and majority language are always in contact, including during the very early years, which are generally
deemed to be crucial for language acquisition. In the case of successive [simultaneous] acquisition, i.e. when AoO [age of onset of acquisition] in the HL precedes AoO in the majority language, the HL has more time to develop independently.”

However, only some of the studies that have been interpreted as evidence for incomplete acquisition have found that simultaneous HS show greater differences from monolingual populations than sequential bilinguals (e.g., Montrul, 2002; Montrul & Potowski, 2007), while others have not found differences between these groups (Montrul & Sánchez-Walker, 2013). While all of these studies share the conclusion that early development of the socially prevalent language impedes HL acquisition, only some have found age effects between sequential and simultaneous bilinguals, while others have claimed that both groups exhibit similar levels of incomplete development when compared to monolinguals.

There are two important considerations in research that has adopted the dichotomy of sequential versus simultaneous HS. Firstly, studies evaluating this variable (e.g., Montrul, 2002; Montrul & Sánchez-Walker, 2013) have traditionally incorporated categorical groups, which may not capture the gradient impact of age of first exposure to the L2 (see Ortega, 2020). Secondly, it is unclear exactly how to dichotomize sequential and simultaneous bilingualism. As as Nicoladis (2018, p. 82) describes, “Researchers have reached no consensus as to the specific age or even the age range at which age of acquisition starts to make a difference.” Consequently, it is difficult to generalize across studies that have found an effect for age of onset using the binary division between
sequential and simultaneous, because there has not been consistency about which age ranges fit into each category (see Thane, 2023a for a lengthier discussion).³

Alternatively, attrition describes the partial or total loss of linguistic features due to decreased exposure to and use of the HL (e.g., Köpke, 2007; Polinsky, 1997, 2011, 2018; Schmid & Köpke, 2017). While incomplete acquisition describes fossilized L1 development due to reduced input, attrition focuses on the loss of linguistic features that were previously present in a speaker’s grammar. These two frameworks are common in that they represent the purported end state of HS’ knowledge of the HL.⁴ However, attrition describes loss, while incomplete acquisition describes an interruption in development. Teasing incomplete acquisition apart from attrition is only empirically viable with longitudinal analyses that illustrate that a component of the grammar once used productively is later lost (Montrul, 2013, 2016). Furthermore, it is difficult to conclude precisely if and when the acquisition or subsequent loss begins and where it ceases, such that the static nature of these theories may overlook the complex processes of bilingual development.

The notions of incompleteness and loss of heritage grammars have inspired a spirited discussion (Bayram et al., 2019; den Dikken, 2018; Domínguez et al., 2019;

³ Thane (2023b) provides evidence that even when addressed as a continuous variable, age of onset cannot capture HS’ variable use of preterit morphology, unlike in Montrul’s (2002) study that used a categorical grouping between sequential and simultaneous bilinguals.

⁴ According to Benmamoun, Montrul, and Polinsky (2013), incomplete acquisition also describes the process of the acquisition of HLs. However, as Guijarro Fuentes and Schmitz (2015) and Putnam and Sánchez (2013) point out, most early research on incomplete acquisition emphasizes the result of an interrupted process of acquisition, concentrating on the point of fossilization in heritage grammars, and therefore does not place great emphasis on ongoing processes of HL change.
Guijarro-Fuentes & Schmitz, 2015; Hicks & Domínguez, 2020; Kupisch & Rothman, 2018; Otheguy, 2019; Pascual y Cabo & Rothman, 2012; Pires & Rothman, 2009b; Rothman & Treffers-Daller, 2014; Sánchez, 2017; Silva-Corvalán, 2018, 2018b; Zyzik, 2019) for multiple reasons. Firstly, Pires and Rothman (2009b, p. 213) claim that the difficulty in differentiating between incomplete acquisition and attrition “Allows one to avoid making choices between the factors that constitute the actual source of grammatical knowledge among heritage speakers” by focusing on their resultant knowledge, and not on the processes that promulgate this change. Secondly, positing a theory of incomplete acquisition calls for a precise threshold of input necessary to build “complete” grammars. In light of studies documenting adults’ differential levels of attainment of complex L1 structures (Andringa & Dąbrowska, 2018; Dąbrowska, 2008, 2010, 2018; Dąbrowska & Street, 2006; Street & Dąbrowska, 2010), it is difficult to conclude that monolinguals always possess more sophisticated or “complete” grammars. This final critique is relevant to the input quality approach, which concentrates on shifts in competence of monolingually-raised speakers who provide exposure to HS.

1.3.2. Input Quality Approach

A fundamental assumption of representational deficit accounts is that it is HS who differ in their grammatical competence when compared to those who provide them with input. However, Pascual y Cabo and Rothman (2012) argue that this input itself may be fundamentally different from the exposure that monolingual speakers encounter. These differences are both quantitative and qualitative. The quantitative component of input relates to how much exposure a speaker receives to any language, as discussed in the previous section. However, the qualitative component of input is also a necessary
consideration, as it is possible that HS’ caregivers may experience changes in their L1 knowledge upon entering into contact with a new language and may transmit these differences to the following generation. Pascual y Cabo (2016, p. 34) calls this phenomenon “emerging optionality.”

A series of studies by Pires and Rothman highlight how changes in input across generations is a necessary consideration in HL research. In Pires and Rothman (2009b), results from a grammaticality judgment task and an interpretation measure revealed that HS of European Portuguese showed indistinguishable knowledge of inflected infinitives when compared to monolingual speakers in Lisbon. However, Rothman (2007) showed that Brazilian Portuguese HS did not appear to be sensitive to the syntactic and semantic entailments of inflected infinitives. Pires and Rothman (2009a) found that Brazilian Portuguese monolingual children also showed limited knowledge of inflected infinitives until adolescence, suggesting that this structure is learned through education and is therefore restricted to formal registers in Brazil. These conclusions suggest that in colloquial registers of Brazilian Portuguese, speakers no longer make use of inflected infinitives, while this structure is still robust in the European dialect. Therefore, the apparent lack of sensitivity to inflected infinitives in Brazilian Portuguese HS, but crucially, not in European Portuguese HS, suggests that the input to which (some) HS receive exposure differs qualitatively from that of monolingual speakers. Together, these findings illustrate that there is nothing about inflected infinitives that HS of Brazilian Portuguese are unable to acquire, but rather demonstrate that these speakers possess a grammar lacking inflected infinitives due to their absence from (or very limited presence in) their input.
A close analysis of previous experimental studies reveals that Spanish-dominant bilingual participants produced fewer instances of preterit morphology with state verbs (Montrul, 2002; Thane, 2023b) and of DOM (Montrul & Sánchez-Walker, 2013) than monolinguals would. Regarding DOM, SDB who lived in contact with English at the time of study used this structure in 67% of the expected contexts on a controlled production task. This suggests that those bilinguals who provide input to HS and who expectedly exhibit “stable” knowledge of morphology and syntax appear to be encountering a considerable degree of restructuring in oral production. Consequently, HS may be exposed to input that has already experienced contact-induced change. Another example from experimental research is Pascual y Cabo’s (2013) study, in which a Spanish-dominant comparison group accepted some sentences in the passive voice with the dative experiencer verb *gustar* (*to please, to like*), whose syntax is incompatible with passives in monolingual varieties. In these cases, HS showed greater variability than their caregivers, suggesting that they may amplify changes that are already in progress.

Age of acquisition of the L2 can also lead to unique grammatical outcomes that need not be marked as “complete” or “incomplete.” For instance, Pascual y Cabo and Gómez Soler (2015) show how age of acquisition leads to qualitatively different – but not deficient – competence in the use of prepositions in heritage Spanish. Preposition stranding (that is, finishing a clause with a preposition) is common in spoken English, but is ungrammatical in monolingual varieties of Spanish. Sequential bilingual participants with a later age of first exposure to English were consistent in rejecting Spanish sentences with preposition stranding on a grammaticality judgment task, while sequential HS with earlier exposure to both languages exhibited a wider degree of individual variability. In
general, simultaneous HS were accepting of the preposition system used in monolingual varieties of Spanish, but also exhibited greater flexibility by accepting English-like constructions due to the early and constant crosslinguistic influence of English on Spanish language development. These individuals thus display a more flexible or “overcomplete” representation of this structure than monolingual speakers because it sources knowledge from multiple languages.

In conclusion, the input quality approach places emphasis on qualitative features of the input to which HS are exposed. Therefore, Pascual y Cabo and Rothman (2012) argue that what may appear to be incomplete development or attrition may in fact be a consequence of changing grammatical tendencies already set into motion in the contact varieties to which HS receive exposure. This reiterates the need for bilingual baselines and argues for a close relationship between HL acquisition and diachronic change (see Pires and Rothman, 2009b and references therein). It must be noted, however, that HS appear to exhibit a greater degree of variability in the use of certain structures than monolingual speakers who provide them with exposure, such that these input differences alone may not capture the full extent of variability that HS exhibit.

1.3.3. Activation Approach

A third framework of HL acquisition is the activation approach (Putnam & Sánchez, 2013; Putnam et al., 2019), based upon the Feature Reassembly Hypothesis first postulated in generative second language acquisition literature (Lardiere, 1998a, 1998b, 2000, 2003, 2005, 2007, 2008, 2009). Following this approach, bilinguals reconfigure morphological and syntactic features (known as functional features in minimalist theory of grammar; Chomsky, 1995). The activation approach posits that high levels of
activation and processing of linguistic information allow bilinguals to convert a greater amount of input into intake, which in turn leads to stronger associations between phonological, lexical, and morphosyntactic features. In contrast, less frequent retrieval and processing can lead to the dissociation of bundles of lexical and morphosyntactic features and to their replacement by those of the dominant language. Such a process frequently yields “hybrid” representations that integrate features from two languages known as bilingual alignments (Sánchez, 2019). Therefore, this approach differs from representational deficits and input quality because it claims that something beyond input – processing of input for conversion to intake – is an essential ingredient for HL acquisition and maintenance. The advantage of this hypothesis is that it can be structure-specific, as HS process some features that are more prevalent in their input with greater frequency than others (see O’Grady et al., 2011).

The activation approach provides a four-stage model that sketches how patterns of activation of L1 functional features can lead to changes in how HS map morphosyntactic forms onto lexical items. At Stage 1, HS may begin to encounter difficulties using L1 functional features under the performative pressures of production, particularly with low-frequency lexical items. At Stage 2, feature bundles can also become dissociated from high-frequency lexical items and replaced by those of the dominant language in production, which could result in increased codeswitching or the use of innovative inflectional paradigms. However, the ability to interpret the same features can remain partially or entirely unaffected until Stages 3 and 4, at which time low- and high-frequency lexical items, respectively, encounter reassembly at the representational level. As Perez-Cortes et al. (2019) describe, this staged account can capture asymmetries
between production and interpretation, such that morphological innovations that surface in the former may be performative and plausibly do not impact underlying knowledge as tested through receptive tasks in experimental research. Therefore, the activation approach focuses on patterns of language use that can accommodate gradient changes in grammar such that this approach depicts the gradual processes of change, rather than the end result. Importantly, this framework proposes that decreased use of and exposure to the HL modulates speakers’ sensitivity to lexical frequency and the differences between production and receptive knowledge.

Putnam et al. (2019) describe that, although this model builds on the feature reassembly framework of generative language acquisition research that posits the presence of functional features as part of an innate Universal Grammar (Chomsky, 1995), its focus on frequency of use makes it largely compatible with usage-based theories (see Wulff, 2020 or Wulff and Ellis, 2018 for recent overviews of usage-based approaches within bilingualism research). These approaches are yet to be widely extended to HL acquisition (but see Karayayla, 2020; López-Beltrán Forcada, 2021; O’Grady et al., 2011); however, López-Beltrán Forcada and Carlson (2020) describe that emphasizing the roles of language experience and use is essential for understanding HLs and their speakers. Moreover, the activation approach could be extended to Spanish-dominant populations, as these bilinguals may also experience some of the stages of reassembly once they enter into daily contact with their L2.

There are multiple studies that have found that child Spanish HS are sensitive to patterns of exposure. For instance, Cuza et al. (2021) found that children who had received more exposure to Spanish were less likely to overextend the copular verb *estar*
to contexts where the “competing” form *ser* was expected. Furthermore, Cuza and Pérez-Tattam (2013) found that HS children with greater exposure to Spanish were more precise in the production of feminine noun-adjective gender agreement. These researchers concluded that English-dominant HS children had mapped the genderless system of English, their stronger language, onto feminine gender inflections on adjectives, resulting in their reassembly. In her analysis of young children acquiring English and Spanish, Goldin (2021) found that the amount of output in Spanish was a significant predictor of participants’ accuracy in producing subject-verb agreement morphology, implying that more frequent production is also pivotal to young bilingual speakers’ development of morphosyntactic structures.

Cuza and Frank (2011) and Perez-Cortes (2016) also provide evidence for the activation approach with adults, concentrating on Spanish HS’ knowledge of double-*que* questions and subjunctive mood morphology, respectively. Cuza and Frank found that those HS who reported more frequent use of Spanish and who made more frequent visits to a Spanish-speaking country in childhood showed stronger knowledge of double-*que* questions across production, comprehension, and acceptability judgment tasks. Similarly, Perez-Cortes found that bilinguals with greater frequency of use, higher proficiency, and earlier ages of acquisition were more likely to produce the subjunctive mood in expected contexts; less-frequent users were more accurate in receptive tasks than in production.

Lastly, as I will discuss in the following sections, a series of recent studies have found that the frequency of individual lexical items affects Spanish HS’ use of multiple

---

5 The authors call these contexts individual-level predicates, following previous studies on the acquisition of the Spanish copular contrast (Arnaus Gil, Jiménez Gaspar, & Müller, 2018).
inflectional and syntactic structures (Giancaspro, 2020; Hur, 2020, 2021; Hur et al., 2020; López Otero, 2020, 2022; Perez-Cortes, 2020). These studies, which I address at greater length in §1.4.3, provide evidence that decreased use of the HL may cause HS to encounter dissociations between morphosyntactic features and lower-frequency lexical items, as proposed in the staged account of the activation approach.

To summarize, the activation approach posits that the frequent use of and exposure to the HL leads to more processing and intake. This in turn activates and strengthens bundles of lexical and morphosyntactic features; without frequent activation, these features may become reassembled due to crosslinguistic influence. Within this framework, less-frequent lexical items are most likely to encounter restructuring, and production becomes affected before comprehension. Evidence for this hypothesis has found that current and cumulative exposure to Spanish can affect children’s and adults’ use of inflectional morphology and syntactic structures. This hypothesis differs from the representational deficits framework because of its conception of HL acquisition as a process, rather than the end result of HS’ knowledge. Moreover, it obviates the need for separate theories of acquisition and loss (such as incomplete acquisition and attrition) because its focus on patterns of exposure can capture both phenomena within a single account. Recently, scholars such as Montrul (2021), who have often been proponents of the incomplete acquisition approach, have recognized that there is a role of activation of linguistic information in the production of HLs.

1.3.4. Summary of Theories of Heritage Language Acquisition

These theories have been influential in broadening our understanding of HLs and the remarkable intricacies that they have. From the perspective of incomplete acquisition,
age of onset of L2 acquisition represents the point of interruption or reduction in exposure to and use of the HL. Attrition is not a theory of HL acquisition, but rather one of change, as it describes cases of loss of grammar that was once active in HS’ grammar. From the perspective of the input quality approach, the language in the input that HS receive has already encountered change when compared to monolingual speakers and HS magnify this evolving variety in their grammars. Lastly, the activation approach posits that use of the HL is necessary to convert input to intake and to maintain the strength of the associations between lexical items and morphosyntactic features. While these approaches capture differences between groups or individual speakers, an equally important question in HL acquisition research is how to address variability within a single speaker. In the final section of this chapter, I review avenues of research that can help to address the question of why and how a single HS may show variability in the use of the HL.

1.4. Addressing Sources of Heritage Language Variability

Although HS may never produce an instance of certain structures, total divergence from monolinguals or bilinguals who are dominant in the HL is far less common. Instead, HS frequently use given grammatical structures in some situations where other populations of native speakers do as well, but not others. Relatedly, some HS may show more variability in their knowledge of a particular structure than others. Therefore, it is important to explore the ways in which it is possible to characterize the variability between HS, as well as the differences in knowledge that a single HS possesses, that is, why individuals may produce a given grammatical construction in certain contexts but not in others.
The results of Montrul and Sánchez-Walker’s (2013) study concerning DOM is particularly illustrative of the full range of variability between HS: some participants produced DOM in 100% of the expected contexts, while others did not produce a single instance of the object marker a. Most HS produced this structure inconsistently, such that sequential bilinguals produced the animate and specific direct object marker a in 69% of expected contexts, and simultaneous bilinguals did so in 66% of these contexts. These findings highlight that a single structure can trigger differential levels of variability within a single group of speakers that ranges from total convergence with monolingual varieties to total lack of production of this structure, but most place somewhere in between.

As a result, theories of HL acquisition are faced with accommodating three types of variability. These theories are tasked with providing an account for differences between individuals who are dominant (or monolingual) in the HL and HS (between-groups variability), how members of the HS community can differ from one another (between-speaker variability), and what causes differences to emerge within the grammar of a single individual (within-speaker variability). An important theoretical consideration, then, is why HS use some structures more than others or why they use a single structure variably. In the following sections, I explore possible approaches that can capture variability within bilinguals’ grammatical repertoires.

1.4.1. Interface Variability

One approach to addressing variability is to distinguish between HS’ knowledge on a structure-by-structure basis. A common account that has been put forth in bilingualism research is the Interface Hypothesis (e.g., Chamorro and Sorace, 2019;
Sorace, 2000, 2005, 2007, 2011; Sorace & Filiaci, 2006; Sorace & Serratrice, 2009; Tsimpli & Sorace, 2006). Following the Interface Hypothesis, bilinguals experience the least degree of difficulty with “core” syntactic properties such as word order that do not vary based upon semantic or pragmatic factors.\(^6\) In contrast, this hypothesis predicts that bilinguals will have increasing levels of difficulty in the use of syntactic structures that are modulated by semantic entailments, known as the internal or syntax-semantics interface. Examples of these structures in Spanish are DOM (in which animacy and specificity regulates the use of the object marker a; Fábregas, 2013; Torrego, 1998) and inalienable possession (in which objects in kinship or part-whole relations with the subject require the use of a different syntactic structure; Chappell & McGregor, 1996). Sorace and colleagues predict that the greatest degree of variability occurs in bilingual grammars in areas of syntax within which pragmatic processing is necessary, known as the external or syntax-discourse/pragmatics interface, in which bilinguals need to rely on contextual, discursive, or non-linguistic information. Examples of these structures include anaphora resolution, the use of null and overt subjects, and, as will be relevant to this study, certain uses of subjunctive mood.

Research on Spanish as a HL has provided some support for this hypothesis, although there has also been considerable counterevidence. Traditionally, research on the Interface Hypothesis has focused on the distribution of null and overt subjects in languages whose verbal morphology licenses the absence of an explicit subject (see Camacho, 2013). Spanish HS appear to produce more overt subjects than monolingual

\(^6\) Canonical word order does not have pragmatic entailments; however, topicalization and focalization involve pragmatic knowledge and result in movement of constituents that affect word order (e.g., SVO $\Rightarrow$ OSV).
speakers due to the influence of English, a language lacking strong verbal agreement and in which null subjects are ungrammatical (Liceras et al., 2012; Montrul, 2004a, 2006; Montrul & Sánchez-Walker, 2015; Paradis & Navarro, 2003). Relatively, through results of an interpretation task, Keating, VanPatten, and Jegerski (2011) concluded that Spanish HS relied more on overt subject pronouns in resolving anaphora ambiguities than the Spanish-dominant comparison group. In addition, van Osch et al. (2014) found that Spanish HS experienced greater difficulty producing gender agreement morphology in determiner-adjective pairings where the noun was absent but had been previously identified in the discourse (e.g., el nuevo, the new one) rather than those determiner phrases in which the noun was present. Additional support for the Interface Hypothesis in Spanish as a HL comes from research on subjunctive mood (see in particular Pascual y Cabo et al., 2012 and van Osch et al., 2017), although there is also counterevidence, as I will discuss in the following chapter.

However, as Montrul (2011) describes, it is difficult to define the notion of interfaces and to identify exactly what criteria characterize any given syntactic structure as situated at the boundaries with semantics or pragmatics. Moreover, there also exists counterevidence to the Interface Hypothesis from two perspectives. Firstly, there is evidence that Spanish HS can acquire syntactic structures that require pragmatic processing in a way that does not show variability. For instance, in their felicity judgment task, Leal-Méndez et al. (2015) found that HS demonstrated robust knowledge of clitic left dislocations and fronted focus in receptive tasks, both syntactic movements modulated by pragmatic factors. Secondly, there are areas of “core” syntax that do not involve pragmatic knowledge such as preposition stranding (Pascual Cabo y Gómez
Soler, 2015), dative experiencer verbs (Pascual y Cabo, 2013), unaccusativity (Montrul, 2005), and comprehension of relative clauses (Sánchez-Walker, 2013) in which HS do show variability from monolingual speakers. Therefore, the distinction between interfaces set forth by the Interface Hypothesis appears to explain variability in HS’ use of some interface structures more concretely than in others.

In sum, the Interface Hypothesis presents an account for addressing variability within a single speaker’s grammatical knowledge of different structures by grouping them into categories based upon interfaces between syntax and other areas of grammar that purportedly have different levels of acquisitional difficulty. Structures that require integrating semantic information and syntactic knowledge represent the internal interface, while those involving syntax and pragmatics are situated at the external interface. Researchers such as Chamorro and Sorace (2019) propose that the external interface is most vulnerable in HLs, followed by the internal interface between syntax and semantics. However, syntactic structures that do not have semantic or pragmatic entailments are least likely to undergo restructuring or to show variable use in heritage grammars given their lower processing costs. While many studies support the Interface Hypothesis, there appear to be multiple findings that constitute counterevidence, defining the boundaries between semantics and pragmatics is challenging, and there are few structures that do not have any component of interface with semantics or pragmatics. Therefore, additional and complementary methods may be necessary for capturing within-speaker variability.

It can be argued that since these verbs subcategorize for dative experiencers, this exemplifies an example of the internal (syntax–semantics) interface. However, this reinforces the notion that defining interfaces is challenging.
1.4.2. Task Effects

One such approach to capturing HL variability is comparing a single speakers’ performance between production and comprehension. Production tasks often yield greater variability than receptive measures, especially in the case of HS, given their less-frequent use of their HL. Following this claim, Perez-Cortes et al. (2019) describe that HS have differential access to featural representations under the taxing pressures of language production when compared to comprehension. Some HS experience little to no mismatch between production and comprehension, especially those who make frequent use of the HL. In contrast, other speakers may possess little productive knowledge while retaining fine-tuned receptive capacities. For instance, Sherkina-Lieber (2011, 2015) demonstrated that some English-dominant receptive HS of Inuktitut in her study were highly accurate in the interpretation of tense, aspect, and agreement morphology. Therefore, HS frequently show notable differences between production than comprehension that would be very uncharacteristic of monolingual grammars.

In Spanish as a HL, Perez-Cortes (2016)\(^8\) found that speakers with lower levels of use of and proficiency in the HL used the subjunctive mood more frequently on a truth value task and accepted it in a judgment task than they produced it. Giancaspro and Sánchez (2021) provide similar results in a study of inalienable possession in Spanish as a HL, in which HS often produced English-like forms using possessive determiners in production (e.g., *lavo mis dientes*, lit. *I brush my teeth*), while they preferred reflexive clitic pronouns and definite articles (e.g., *me lavo los dientes*, lit. *I wash myself the teeth*) along with Spanish-dominant comparison participants on a receptive task. This suggests

\(^8\) Also cited in Perez-Cortes (2021a, 2021b, 2022).
that HS may experience difficulty accessing and integrating linguistic representations and could rely on knowledge of their stronger language, leading to crosslinguistic influence in production. However, these same speakers appear to possess more robust knowledge when assessed using receptive measures, depending on proficiency level.

These studies provide evidence supporting the need to address differences between tasks, but still do not capture variability within a single task and when evaluating a single grammatical property. In other words, both the Interface Hypothesis and productive-receptive asymmetries can explore differences between speakers in different areas of their grammar. Nevertheless, these theories do not address why a single HS uses a given grammatical property in some situations but omits it in others. As a result, it is necessary to develop additional tools for addressing HS’ gradient knowledge of linguistic structures.

### 1.4.3. Lexical Frequency

A useful measure for observing within-speaker and within-structure (e.g., within a single speaker’s grammar) variability is frequency. Since HS receive less exposure to their HL than monolingual speakers, it is logical that the forms that they encounter most often in the input should be those with which they experience the greatest degree of similarity to monolinguals. Therefore, frequency has the potential to expose fine-grained variability within a single speaker, going beyond group-level or individual analyses. There are multiple types of frequency that have been described in language acquisition research.

On one hand, *token frequency* refers to “how often a particular form appears in the input,” (Ellis, 2013, p. 93). A related concept is *lemma frequency*, which refers to the
sum of all of the token frequencies of derivations of a particular form in the input (Baayen & Schrueder, 2000). An example of lemma frequency would be the total number of tokens for all possible conjugations of a verbal item (e.g., finite conjugations, infinitive forms, gerunds, and participles). To be consistent with recent research on Spanish as a HL (e.g., Giancaspro, 2020; Hur, 2020; Hur et al., 2020; López Otero, 2020, 2022; Perez-Cortes, 2020), I refer to lemma frequency as lexical frequency throughout this dissertation. On the other hand, type frequency refers to how often a given construction can be used productively (Bybee, 1985; Bybee & Hopper, 2001). Morphological structures with low type frequencies are only productive with a small subset of lexical items, and are more frequently known as irregular forms, and those with high type frequencies are exemplars of a regular or canonical form that can be applied productively to a larger number of lexical items. In this project, I address lexical frequency, but both types of frequency appear to affect Spanish HS, as I will discuss below.

Early indirect evidence of the impact of lexical frequency on inflectional morphology in heritage grammars comes from two sources. Firstly, Dorian (1981) found that HS of Scots Gaelic who were dominant in English were able to use conditional morphology productively with the highly frequent copular verb, but not with other verbs. Similarly, in Gal’s (1989) analysis of oral production data from a multigenerational group of Austrian German-dominant HS of Hungarian, speakers in the younger generation were able to use causative morphology with only the most frequent lexical verbs. Although these results provide qualitative evidence for the influence of frequency, they did not contain experimental tasks specifically designed to evaluate this variable.
More recent research has carefully manipulated the frequency of words in order to investigate the importance of this variable with a wider spectrum of lexical items. These studies have shown that HS are more likely to use morphological and syntactic structures in a way that is consistent with their baseline with more-frequent lexical items. Firstly, Giancaspro (2020) found that advanced proficiency Spanish HS were more accurate in using the subjunctive mood with the most frequent verbs used in his tasks, and that participants’ variability was greater in production than on a receptive task. Subsequently, López Otero (2020) extended these findings to HS’ use of imperative commands and Hur et al. (2020) found that lexical frequency also impacts noun-adjective gender agreement in the nominal domain. Additionally, Thane (2023b) found that lexical frequency affected HS’ production of preterit aspect with state verbs. Giancaspro and Thane utilized the Davies (2006) *Corpus del español*, while the other studies incorporated a self-reported frequency task, in which participants were asked to rate how frequently they utilized each of the words used in the experimental tasks.

Three additional contributions to this area of research show that frequency effects can also account for syntactic variability. Hur (2020) found that Spanish HS with intermediate proficiency were sensitive to the frequency of verbs in the production of the differential object marker *a* preceding animate direct objects. Additionally, Perez-Cortes (2022) showed that HS produced and accepted the subjunctive mood more often following more-frequent matrix verbs, and López-Beltrán Forcada (2021) also demonstrated that HS produced and processed the subjunctive more consistently with monolingual speakers following matrix items that result in the most frequent use of the subjunctive in the subordinate clause. Finally, López Otero (2022) reported that despite
overall high levels of accuracy, Spanish HS were most likely to produce non-canonical object-verb-subject word order with unaccusative verbs that participants rated as more frequent, but that frequency did not affect performance on a receptive measure. As a result, it appears that frequency has implications for HS’ knowledge of both morphological and syntactic structure.

Despite the consistency across these studies, all of them have evaluated adult HS, leaving the question of when these frequency-sensitive stages emerge and if children are also susceptible to them. There is, however, extensive evidence in bilingual and monolingual first language acquisition that lexical frequency affects children. Ambridge et al. (2010) provide an overview of dozens of studies that show frequency effects in monolingual acquisition, concentrating in particular on English, but also on other languages. Their survey highlights that these approaches are most compatible with constructivist (usage-based) theories of acquisition, but are not altogether incompatible with generative analyses such as Putnam and Sánchez’s (2013) activation and reassembly framework.

Two specific studies within this line of research are relevant to the present dissertation. Firstly, Nicoladis et al. (2007) found that French-English bilingual children were most accurate in producing the past tense with the most frequent verbs first, before they gradually developed the ability to do so with less-frequent lexical items. Additionally, Shin (2016) found that multiple constraints interacted with lexical frequency in children’s acquisition of null and overt subjects: younger children produced a greater quantity of overt subjects with verbs with imperfect morphology that represented 1% or more of the lexical items in her corpus, while older children produced
overt subjects more reliably in the imperfect regardless of the verbs’ frequency. Therefore, it appears that frequency also affects the speed with which bilingual and monolingual children’s development of morphological and syntactic structures.

The question of when lexical begins to affect heritage grammars is best answered by longitudinal data showing that HS lose their ability to use inflectional and syntactic structures with infrequent lexical items or continue to develop infrequent items over time. However, in the absence of such data, comparing HS children with different conditions of exposure to the HL to one another is an innovative approach that allows us to explore if and when frequency effects emerge in childhood and if different patterns of exposure impact HS’ sensitivity to this variable. Therefore, exploring frequency effects in children by comparing HS in bilingual education programs to age matched-peers in monolingual schools has the potential to unearth two unanswered questions surrounding the importance of this variable in HL acquisition. Firstly, it can elucidate whether these effects are present in childhood, and therefore emerge at an early age, and secondly, it allows us to tease apart whether sustained exposure (or lack thereof) to the HL at school impacts the extent of within-speaker variability.

To summarize, lexical frequency holds promise as a variable that can allow us to develop a fine-grained understanding of variability in heritage grammars. In contrast to variables such as age of acquisition, morphosyntactic proficiency, and frequency of use, all of which can account for differences between speakers, lexical frequency is useful for observing variability within single speakers’ grammars. Furthermore, lexical frequency can capture differences in speakers’ knowledge within a single linguistic task (e.g., within production or comprehension data) and in the use of a single structure. A group of
recent studies has shown that lexical frequency impacts HS across their inflectional system. However, there is limited knowledge of how frequency affects HS children, a question that could impact our knowledge of HL acquisition more generally.

1.5. Concluding Remarks

Research in the area of HLs has continued to grow in the recent decades, and we have amassed impressive knowledge in particular of Spanish in the United States. As mentioned previously, there are three goals in the subfield of bilingualism surrounding the acquisition of HLs: firstly, we must understand the nature of HLs and their structure, secondly, we must develop models of acquisition that help us to elucidate the key factors that can account for between- and within-speaker variability, and thirdly, we must use these findings to approach broader issues such as bilingual education and social justice for bilingual individuals. The abundance of studies on Spanish as a HL has helped substantially to contribute to the proposal of multiple accounts of HL acquisition, which include theories that posit central roles for age of acquisition, frequency of use, and qualitatively different factors in the input that these bilinguals receive. This body of research has also allowed us to understand that there appear to be impressive similarities in the heritage varieties of a number of languages (Polinsky & Scontras, 2020), which gives us useful predictions for studying their acquisition.

In addition to understanding the factors that influence differences between HS, it is important to identify methods with which we can document within-speaker variability. The Interface Hypothesis suggests that the integration of semantic and pragmatic content causes optionality in using syntactic structures and may lead to language attrition. In addition, it is evident that HS can possess highly-developed receptive knowledge without
frequent production of their HL. Therefore, these bilinguals may show variable knowledge of a single linguistic structure when their productive capacities are compared to their performance on receptive tasks. Finally, HS appear to be sensitive to lexical frequency, such that they may be more likely to use inflectional and syntactic structures with more frequent lexical items. Exploring the role of frequency in bilingual children is a new avenue through which we can broaden our understanding of the importance of this variable in HL research. Furthermore, no previous study has shown that this age group experiences asymmetrical knowledge of the HL such that greater optionality can be observed in production than in underlying knowledge.

Although I will return to the topic of bilingual schooling and its role in HL research in Chapter 3, it is first necessary to develop a deeper understanding of the Spanish subjunctive mood. This structure is an ideal testing ground for examining bilingual language development, as it represents Polinsky and Scontras’ (2020) Morphology Problem and Distance Problem. Moreover, acquiring this structure has proven to be particularly challenging for bilingual populations, and has a protracted developmental timeline even in monolingual children. Therefore, it is well-positioned for testing the effects of age of acquisition, frequency of use, and lexical frequency, all of which have been shown to affect its use in adulthood (Giancaspro, 2020; López-Beltrán Forcada, 2021; Montrul, 2009; Montrul & Perpinán, 2011; Perez-Cortes, 2022). Furthermore, because the subjunctive is marked using verbal inflections, it is possible to observe bilinguals’ sensitivity to lexical frequency with individual verbs, as in Giancaspro’s (2017) study.9 Therefore, this structure is ideal for testing both between-

---

9 See also Giancaspro (2019a, 2019b, 2020).
speaker and within-speaker variability. In the following chapter, I provide an overview of the syntax and semantics of the Spanish subjunctive mood, and of the multiple accounts put forth to characterize its use. I will also review previous research on its acquisition in Spanish-speaking populations, both in monolingual communities and in HS.
CHAPTER 2: THE SUBJUNCTIVE MOOD IN SPANISH

2.1. Introduction

In Chapter 1, I presented the theories of HL acquisition, the factors that can give rise to the differences that may emerge between HS and other speakers of the same language, and the methods that can capture variability within a single HS. The impact of these factors has been particularly evident in research on subjunctive mood, a complex area of the verbal system of Spanish that has a lengthy acquisitional timeline even for monolingual children. Consequently, the subjunctive mood has proven to be a fertile testing ground for exploring the factors that shape Spanish as a HL. In this chapter, I introduce the subjunctive, the theoretical accounts that describe its use, and the previous research on its acquisition by monolingual and HS populations.

As I will argue throughout this chapter, the subjunctive is a complex morphosyntactic structure in Spanish whose acquisition is ideal to study in situations of reduced input and exposure. By extension, it is intriguing to study how bilingual schooling, which provides HS with more HL input in childhood than in traditional educational settings, impacts the development of this structure. As mentioned in Chapter 1, the subjunctive represents two of Polinsky and Scontras’ (2020) triggers for deviation in HIs. Firstly, it exemplifies the Morphology Problem, which claims that inflections that are infrequent and lack rich semantic content are prone to restructuring. Secondly, the subjunctive epitomizes the Distance Problem, through which use of this mood is conditioned by a long-distance syntactic dependency.

In order to provide a principled account of subjunctive mood, this chapter is arranged as follows: first, in §2.2, I provide an overview of the morphological structure
of the subjunctive and review the syntactic and semantic accounts put forth to characterize its use. In particular, I concentrate on modal bases as an important semantic consideration, as well as on syntactic accounts for intensional and polarity subjunctive. I also discuss how this structure is different from the English realization of mood, which could explain why its acquisition is particularly difficult for bilingual speakers due to crosslinguistic influence. I turn to a thorough overview of monolingual and bilingual childhood acquisition and adult HS’ knowledge of the subjunctive in §2.3. Finally, in §2.4, I explore the possibility that formal education impacts subjunctive development, which makes it an ideal structure to research within the context of bilingual immersion classrooms.

2.2. Overview of Subjunctive Mood

The subjunctive is a morphosyntactic structure that marks modality through morphology (Bosque, 2012; Palmer, 2001). Modality refers to the evaluation of the truth value of propositions (Sánchez-Naranjo, 2014). Spanish has three moods: indicative, subjunctive, and imperative (Seco, 1990), but acquisitional research on this topic has typically focused on the contrast between the former two (but see López Otero, 2020 for an exception). In an analysis of over two million words, Biber et al. (2006) found that only 7.2% of verbs were inflected for subjunctive, while Kanwit and Geeslin (2018) found that the indicative appears in approximately 90% of utterances. Therefore, the subjunctive is infrequent in the input.

There are multiple syntactic contexts in which the subjunctive occurs that are modulated by both semantics and pragmatics. As Fábregas (2014) points out, there are distinct functions of subjunctive morphology that have been subsumed under various
theoretical accounts. The complex interaction of pragmatics and semantics with the syntax of mood has been quite challenging for researchers to describe. Because of the challenges that linguists have experienced in providing an all-encompassing account of the subjunctive mood, it follows that language learners also find this structure difficult to acquire. In fact, its complexity makes it a robust predictor of specific language impairment in bilingual children (Castilla-Earls et al., 2018, 2021). It is thus not surprising that the subjunctive mood has also been popular in research on Spanish as a HL precisely because of the multiple layers of linguistic competence that speakers must possess in order to acquire this complex structure.

A great number of studies have concentrated on how monolingual children (e.g., Ahern & Torrens, 2021; Blake, 1980; Dracos et al., 2019; Pérez-Leroux, 1998; Sánchez-Naranjo & Pérez-Leroux, 2010), adult HS (e.g., Giancaspro, 2017; Giancaspro et al., 2022; López-Beltrán Forcada, 2021; Lustres, 2018; Montrul, 2007, 2009; Montrul & Perpiñán, 2011; Perez-Cortes, 2016; van Osch et al., 2017, 2018; van Osch & Sleeman, 2018), and child and adult L2L (e.g., Amenós-Pons et al., 2019; Borgonovo et al., 2005, 2008, 2015; Borgonovo & Prévost, 2003; Bruhn de Garavito, 1997; Fernández-Cuenca & Jegerski, 2022; Gudmestad, 2014; Iverson et al., 2008; Kanwit & Geeslin, 2018; Lustres, 2018; Massery, 2009; Montrul & Perpiñán, 2011; Perez-Cortes, 2016; Potowski, 2007a, 2007b) acquire the subjunctive mood. Furthermore, this grammatical property has attracted considerable attention in research on instructed HL (e.g., Bowles, 2021; Correa, 2011a; Fernández-Cuena & Bowles, 2022; Potowski et al., 2009) and L2 (e.g., Collentine, 1998, 2002; Correa, 2011b; Farley, 2001; Isabelli, 2007; Kirk, 2013; Sessarego, 2016) acquisition. However, there is limited knowledge of child HS’
knowledge of the subjunctive (but see Dracos & Requena, 2022), an area of research that I address in this dissertation. In the following sections, I lay out the extensive body of research that has attempted to describe the subjunctive and its many complexities. I also describe the possibility for crosslinguistic influence from English in Spanish in the United States.

2.2.1. Subjunctive Mood Morphology in Spanish

Subjunctive mood morphology represents a grouping of verbal inflections that are part of the Spanish mood system. There are two morphological paradigms for the subjunctive mood, one in the present tense, and the other in the imperfective past, both of which have paradigms for person and number agreement with the subject. In concert with most previous research, I concentrate on the present subjunctive, and will therefore limit my discussion to this tense here. There are two ways in which the present tense of subjunctive mood is formed, either through a shift in the verbal inflection or through both a morphophonological change in the verb stem and a shift in inflection from the indicative. All first conjugation verbs (that is, those whose infinitives end in –ar) feature a shift in their thematic vowel from /a/ in the present indicative to /e/ to form present subjunctive inflections; the opposite is true of second (–er) and third conjugation (–ir) verbs, whose thematic vowel shifts from /e/ to /a/. The appropriate person-number inflections are applied to these morphemes as with indicative morphology, with the

10 Historically, there was also a future subjunctive that has since been restricted to legal texts and fixed expressions, but that is no longer used productively (Penny, 2002). There are also periphrastic present and past perfect tenses in the subjunctive using the modal verb haber.
exception of first-person singular forms, which are homophones with the third-person singular in the subjunctive.

While canonical formation of the subjunctive in Spanish incorporates the same verbal stem as the indicative and infinitive, oftentimes there is also a shift in the verbal root necessary to mark this structure. Verbs that have irregularities in the first-person singular stem in the present indicative generally also apply this stem to all person-number inflections in the present subjunctive. For example, the first-person singular form of the indicative present of the verb salir (to exit) is salgo, but the /g/ is not part of the rest of the present simple paradigm in the indicative (e.g., sale-3PS-IND); in contrast, all present subjunctive forms of salir feature this first-person singular stem in the indicative (e.g., salga-1PS.SUBJ and 3PS.SUBJ, salgas-2PS.SUBJ, salgamos 1PP.SUBJ, salgan, 3PP.SUBJ). A third small but frequent subset of verbs\(^{11}\) appear to have inflections that are unique to the present subjunctive only (e.g., sepa-1PS.SUBJ, sepas-2PS.SUBJ, but sé-1PS.IND, sabes-2PS.IND for the verb saber, to know). Therefore, the formation of subjunctive mood is situated along a continuum of form regularity, ranging from a single vowel shift in the inflection compared to the indicative to a change in the verbal root that is unique to the present subjunctive paradigm, so speakers must acquire complex morphophonological patterns in order to mark subjunctive mood.

2.2.2. Syntactic and Semantic Approaches to Subjunctive Mood

In addition to acquiring mood morphology, speakers must master the syntactic, semantic, and pragmatic layers of the subjunctive. Subjunctive mood is used almost

\(^{11}\) This also includes verbs such as prever (to foresee) that are derived from higher-frequency forms such as ver (to see).
exclusively in subordinate clauses whose subject is distinct from that of the matrix clause, as in (1), which is known as the disjoint reference effect (Kempchinsky, 2009). In most instances of coreference, an infinitival control structure is used, such as *perder* (to lose-INF) in (2).  

(1) La médica quiere que su paciente pierda peso.  
*The doctor want-3PS_{IND} that her patient lose-3PS_{SUBJ} weight.*  
The doctor wants her patient to lose weight.  

(2) La médica quiere perder peso.  
*The doctor want-3PS_{IND} PRO lose-INF weight.*  
The doctor wants to lose weight.  

Researchers have attempted to characterize the use of the subjunctive based upon semantic (Arregui, 1994; Farkas, 1992; Giannakidou, 2013; Giannakidou & Quer, 1997; Givón, 1994; Quer, 2001, 2006, 2009; Terrell & Hooper, 1974), syntactic (Cinque, 1999; Giorgi & Pianessi, 1997; Kempchinsky, 2009), and pragmatic (e.g., Ahern & Leonetti, 2004; Lavandera, 1983; Mejías-Bikandi, 1998) factors. It should be noted that these approaches to describing the subjunctive are not mutually exclusive; rather, they provide interconnected analyses.  

Traditionally, accounts of the subjunctive have made an attempt to dichotomize the differences between it and the indicative. For instance, some researchers (Terrell, 1976; Terrell & Hooper, 1974) have proposed that the subjunctive is used in contexts of *non-assertion*, while the indicative marks *assertion*. Another traditional approach to the Romance indicative/subjunctive contrast has claimed that the former represents *realis*, or  

---

12 The subjunctive is occasionally used in main clauses following adverbial governors such as *posiblemente* (possibly). Additionally, as Padilla (1990) describes, it can also occur in coreference with the same subject as the matrix clause containing a negated epistemic verb (e.g. *no creo que vuelva a verlo*, I don’t believe I will see him again).
propositions that hold in the real world, while the latter is a marker of *irrealis*, or propositions that do not hold in the real world (Givón, 1994; Whitley, 2002). Still other researchers (Farkas, 1992; Giannakidou, 1997) have proposed that the subjunctive marks non-veridical contexts, while the indicative implies veridicality. However, as Sánchez-Naranjo (2014) describes, there are uses of the subjunctive that imply factual, assertive, or veridical events with factive-emotive predicates, such as (3). Therefore, these theories cannot accommodate all instances of mood use. 

(3) Me alegro de que hayas venido.  
Myself make happy-1SGIND of that have-2SGSUBJ come-PART.  
I am glad that you have come.  
(Sánchez-Naranjo, 2014, p. 129)

While accounts related to assertion, veridicality and realis have focused on creating a dichotomization between the indicative and subjunctive, other scholars have advanced frameworks that can be useful to distinguish between multiple uses of subjunctive mood. As referenced above, the subjunctive marks modality, which Palmer (2001, p. 1) defines as a semantic category across languages that defines the status of propositions. There are multiple types of modality, each which has a unique semantic function. Therefore, applying the framework of modality to the subjunctive mood allows us to focus on various subtypes of the subjunctive, as opposed to dichotomizing the differences between it and the indicative. This shift from the contrast between moods to the different situations in which the subjunctive occurs achieves greater explanatory accuracy (Fábregas, 2014; Lozano, 1995).

Modality has been the product of extensive research in semantics, including seminal work conducted by Kratzer (e.g., 1981, 1991, 1998) and Palmer (2001). Chung and Timberlake’s (1985) analysis is useful in understanding how the subjunctive can be
grouped into three modal bases.\textsuperscript{13} Firstly, the subjunctive can be used with \textit{deontic} predicates that encompass indirect commands and predicates of obligation, preference, and volition. Secondly, the subjunctive can occur with \textit{epistemic} predicates, which reflect the speakers’ evaluation of the truth value of a proposition in all possible worlds (Pérez-Leroux, 1998). Finally, \textit{epistemological} predicates are similar to the epistemic modal base, but speakers must evaluate the truth value of a proposition based upon the perspective of the sentential subject rather than that of the speaker (i.e., Dracos & Requena, 2022). Therefore, it is possible to group the functions of the subjunctive mood into these three modal bases, based on their semantic properties.

Similarly, Quer (1998, 2001, 2006, 2009) proposed that the subjunctive signals a shift in the model of the speaker’s evaluation of a clause. In this regard, Quer’s analysis is similar to Ahern and Leonetti’s (2004) account, in which the researchers describe that the subjunctive encodes \textit{procedural semantics} (see Wilson & Sperber, 1993) that signal how

\textsuperscript{13} Hacquard (2016, p. 45, italics original) clarifies that following Kratzer’s proposal, “Modals combine with a modal base f, which determines an initial set of worlds, and an ordering source g, which provides an ordering given certain ideals.” Therefore, following Kratzerian semantics, the modal base of a predicate is part of the speakers’ evaluations of worlds. Research on the acquisition of mood has frequently used the term propositional modality to refer to this concept; however, following Palmer (2001), whose work on this topic is frequently cited in the acquisitional literature, they are not synonymous. Palmer claims that propositional modality is itself a subgroup of modalities that includes the epistemic and the evidential, while event modality comprises another subgroup that includes the deontic and the dynamic. Therefore, if we use the term propositional modality in place of modal base, we exclude epistemic and epistemological modalities, which are necessary to describe many uses of the subjunctive. Because the purpose of this chapter is to describe the subjunctive mood in Spanish, readers are referred to Palmer (2001) or Hacquard (2016) for further discussion about the theory of modality and the different terminology used in the semantic literature. However, in this study, I use the term modal base to refer to the grouping of modalities into which the subjunctive can be categorized (e.g., deontic, epistemic, and epistemological), in line with Lustres et al. (2020) and Perez-Cortes (2016).
the speaker-hearer should make pragmatic inferences about the truth value of the proposition. Quer (1998) similarly claims that subjunctive inflections signal a shift from the epistemic model of the main clause to a buletic model that implies the absence of commitment to the truth value of the proposition in the subordinate clause.

Based upon this description, Quer (2009) proposed that there are two contexts, the intensional subjunctive and polarity subjunctive, into which it is possible to group the uses of the subjunctive. The intensional subjunctive encompasses contexts in which the indicative mood would, in accordance with prescriptivist theory, be ungrammatical, and in which the subjunctive is the only possible alternative. In these cases, Quer states that mood does not contribute novel semantic information. In contrast, the polarity subjunctive relates to pragmatic presupposition, and includes contexts of negation and interrogatives. In these cases, the selection of either the indicative or the subjunctive mood affects interpretation.

Kempchinsky (2009) proposed distinct syntactic accounts for the intensional and polarity subjunctive. Crucially, she argues that mood is instantiated syntactically through a semantic Worlds [W] feature that involves the projection of two features in the left periphery. The concept of worlds represents the model of speakers’ evaluation of the truth value of a proposition. In the intensional subjunctive, the Worlds feature is uninterpretable, while in that of the polarity subjunctive, it is interpretable. Therefore, these two types of subjunctive require different albeit related syntactic accounts for the single set of inflections that comprise this mood.

2.2.2.1. Intensional Subjunctive. In intensional predicates, subjunctive mood inflections do not contribute novel information to the utterance, but rather reinforce the
lexical semantics of the matrix item that subcategorizes for this mood in contexts of disjoint reference in the subordinate clause. Therefore, these matrix items, which can be verbs such as querer (to want) in (4), prepositional complementizers such as para (for) in (5), or impersonal phrases such as es importante que (it is important that) in (6), lexically select the subjunctive when there is a distinct subject in the subordinate clause (they select a control structure in cases of coreference). In all cases, these matrix items are followed by the complementizer que to introduce a tensed subordinate clause.

(4) Quiero que estudies más.
    Want-1PSIND that study-2PSUBJ more.
    I want you to study more.

(5) Tengo que cocinar para que no pases hambre.
    Have-1PSIND that cook-INF to that no pass-2PSUBJ hunger.
    I have to cook so that you aren’t hungry.

(6) Es importante que hagas ejercicio con frecuencia.
    Is-3PSIND important that make-2PSUBJ exercise with frequency.
    It is important that you exercise frequently.

Since the subjunctive mood does not contribute novel semantic content to the utterance in sentences such as (4–6), a syntactic analysis of contexts such as these must conceive of mood as an uninterpretable feature. Kempchinsky (2009) claims that there is an overlap in how imperatives and volitional clauses are interpreted, claiming that the latter are an example of embedded imperatives. She claims that “True imperatives yield an interpretation ‘anyone other than the speaker’, while embedded imperatives yield an interpretation ‘anyone other than the matrix subject’,” (p. 1788). In this regard, the intensional subjunctive involves a quasi-imperative operator in its syntax.

The process of lexical selection involves the projection of two features in the left periphery (ForceP and FinP) and a mood feature (MoodP), all between the
complementizer phrase (CP) layer and the tense phrase in the subordinate clause.

Kempchinsky describes that the CP selects the aforementioned quasi-imperative operator that occupies the head of Fin, and claims that the Worlds feature is represented syntactically in the head of Force. Here, since the Worlds feature (uW for “unreal worlds”) is uninterpretable, it must be checked and deleted, which takes place in the heads of Fin and Mood. Figure 1 depicts Kempchinsky’s proposed process of lexical selection that results in subjunctive use in intensional contexts.

Figure 1. Kempchinsky’s (2009, p. 1798) structure of intensional subjunctive in Spanish.14

To summarize, the intensional subjunctive occurs in contexts in which matrix items, such as a verb, prepositional complementizer, or impersonal adjectival construction, require a tensed subordinate clause that has a distinct subject from that of the matrix clause. In these contexts, which include some nominal complements (deontic modal base), sentential complements (epistemological modal base), and adverbial clauses (epistemic modal base), linguistic theory considers the indicative to be ungrammatical, such that mood is a mere reinforcement of the lexical semantics of the matrix item and comprises an uninterpretable feature. These contexts of mood use can often be understood as embedded imperatives (Kempchinsky, 2009; Portner, 2005). However,

14 As Giancaspro (2017) notes, the model proposed by Kempchinsky (2009) accounts for the intensional subjunctive following matrix verbs; however, the same mechanism of lexical selection can also account for the use of the subjunctive in other intensional contexts with non-verbal matrix items.
there are also many contexts in which the subjunctive can co-occur grammatically with
the indicative.

2.2.2.2. Polarity Subjunctive. The polarity subjunctive accounts for such
contexts, in which subjunctive mood inflections are licensed through negation,
interrogatives, or pragmatics. In such cases, the licensing of the subjunctive is similar to
that of negative polarity items (Giannakidou, 2013), from which this use of mood gets its
name. The polarity subjunctive encompasses uses of mood that are not lexically selected
by a matrix item. For instance, following Pascual y Cabo et al. (2013), in contexts of
negation, the use of either mood is possible following weak intensional verbs such as
creer (to believe). In these instances, the subjunctive, such as in (7a), implies that the
speaker does not express commitment to the lack of belief that the referent of the
subordinate clause, that is, that the subject of the subordinate clause will not visit the
speaker’s house. However, in (7b), the use of the indicative following the negated
epistemic verb creer implies that the speaker is committed to the truth of this proposition.

(7) a. No creo que venga a mi casa.
    Think-IPSIND that come-3PSUBJ to my house.
    I don’t think that she is going to come to my house [but I am not sure].

b. No creo que viene a mi casa.
    No think-IPSIND that come-3PSUBJ to my house.
    I don’t think that she is going to come to my house [and I am sure].

In addition to negation, the polarity subjunctive also encompasses modal contrasts
in some temporal clauses, in which selection of mood impacts temporal interpretation.
For instance, in sentence (8a), the indicative with cuando implies non-specificity and
habituality, while in sentence (8b), the subjunctive implies a specific but unrealized
future event (Zagona, 2002).
(8) a. Voy a la playa cuando sale el sol.
Go-$1PS_{IND}$ to the beach when out-$3PS_{IND}$ the sun.
I go to the beach when the sun comes out.

b. Voy a la playa cuando salga el sol.
Go-$1PS_{IND}$ to the beach when out-$3PS_{SUBJ}$ the sun.
I will go to the beach when the sun comes out.

Finally, the polarity subjunctive captures the differences between moods in relative clauses. In (9a), the presence of the indicative implies presupposition, that is, that the speaker has knowledge that the referent of the subject of the subordinate clause exists (Kempchinsky, 2009). In contrast, in (7b), the subjunctive mood is restrictive and implies nonpresupposition, that is, the speaker is not aware of the specific existence of the proposition in the subordinate clause.

(9) a. Busco una casa que tiene paredes invisibles.
Search for-$1PS_{IND}$ a house that have-$3PS_{SUBJ}$ walls invisible.
I’m looking for a house with invisible walls [and know that this house exists].

b. Busco una casa que tenga paredes invisibles.
Search for-$1PS_{IND}$ a house that have-$3PS_{SUBJ}$ walls invisible.
I’m looking for a house with invisible walls [and do not know of any such house].

These instances do not involve lexical selection as there are no syntactic features instantiated by the subcategorization frame of a matrix item, but rather the presence or absence of presupposition is implied in the lexical semantics of the main verb. For example, the subjunctive in contexts such as (10b) is ungrammatical, as the definition of the verb ver (to see) is incompatible with nonpresupposition. That is, it is impossible not to presuppose the existence of a house that the speaker can see (veo), so the indicative is required, as in (10a), and the subjunctive would be infelicitous, as in (10b).

(10) a. Veo una casa que tiene paredes invisibles.
Buy-$1PS_{IND}$ a house that have-$3PS_{SUBJ}$ walls invisible.
I buy a house with invisible walls [and do not know of any such house].

b. *Veo una casa que tenga paredes invisibles.
   \textit{Buy-IPS}_{IND} a house that have-3PS_{SUBJ} walls invisible.
   I buy a house with invisible walls [and do not know of any such house].

Therefore, the instances of polarity subjunctive addressed above – negation and interrogatives, temporal clauses, or adjectival relative clauses – account for the use of the subjunctive in contexts in which both moods are grammatical. In these instances, mood must be an \textit{interpretable} feature because it contributes novel semantic information concerning proposition to the utterance. For these instances of subjunctive, Kempchinsky (2009, p. 1799) proposes two differences from the intensional syntax in which mood is uninterpretable, as reviewed in the previous section. Firstly, she claims that the imperative operator that is present in the intensional subjunctive with volitional clauses is not present in the head of Fin, as in polarity contexts, the subjunctive does not represent an embedded imperative. Secondly, the polarity subjunctive involves [W] as an interpretable feature in the head of Mood in the subordinate clause. [W] enters into a feature identification relationship between the heads of Force and Mood, rather than feature checking and deletion as in the case of the intensional subjunctive. Figure 2 illustrates the syntax of the polarity subjunctive.

\[
V_{\text{Matrix}} \ [CP \ [\text{ForceP Force}[W] \ [\text{FinP +Fin} \ [\text{IP (DP)} \ [\text{MoodP} \ [V + T + M[W]] \ [TP \ldots]]]]]]
\]

\textbf{Figure 2.} Kempchinsky’s (2009, p. 1799) structure of polarity subjunctive in Spanish.

To summarize thus far, semantic and syntactic accounts of the subjunctive are necessarily interwoven, and it is not possible to encompass all uses of the subjunctive mood under a single account. Kempchinsky’s analyses integrate \textit{worlds} as a semantic-pragmatic feature that is represented in the syntax of subjunctive complements, which
aligns with theories of modal bases and Quer’s (2009) proposal that mood alterations signal shifts in the model of the speaker through morphosyntactic means. Therefore, the syntax of the subjunctive mood necessarily involves the integration of semantics and pragmatics.

2.2.3. Mood in English and Crosslinguistic Influence

In contrast to the intricate system of mood in Spanish, English does not appear to have a highly productive subjunctive mood system. One use of the English subjunctive is known as the that-subjunctive, exemplified in sentence (11) below.

(11) I insist that he do his homework.

In such sentences, Iverson et al. (2008) claim that the process of lexical selection involved in the intensional subjunctive in Spanish (see Figure 1) can also apply to the that-subjunctive in contexts of disjoint reference in English. At the morphological level, the English that-subjunctive is unmarked, in the sense that bare verbs are used in the subordinate clause, while in Spanish, the subjunctive is marked, through the use of a dedicated inflection. The locus of difference between the two languages is thus that in that-subjunctive constructions such as (11) is the morphological instantiation of the mood feature, in which English drops agreement morphology, whereby Spanish has a unique inflectional paradigm.\(^\text{15}\)

It should be noted that these constructions are increasingly uncommon because this structure has been in a process of loss for over four centuries (Kovács, 2009). Rojas

\(^{15}\)The difference between bare verbs and non-third person singular conjugations cannot be attested morphologically, such that the subjunctive can only be observed through the absence of third person singular inflections in the present tense.
(1998) and Iverson et al. (2008) independently reported that English monolingual speakers accepted both the indicative and that-subjunctive at similarly high rates in judgment tasks. Therefore, English speakers seemingly have great flexibility in the marking of mood, such that both the indicative and that-subjunctive appear equally grammatical to them. These findings suggest that the subjunctive may no longer be obligatory in any context in English grammar.

A far more frequent alternative to the that-subjunctive in English is *for-to* constructions. In English, control structures are common both in coreferential and disjoint reference contexts. Subjects can be placed between the matrix and embedded verb, as in (12). Recall that in Spanish, contexts of disjoint reference result in a tensed subordinate clause with most lexical items,16 and in such instances, sentences such as (13) would be highly unexpected in monolingual varieties.

(12) The doctor wants for her patient to lose weight.

(13) La médica quiere *para su paciente perder peso.

*The doctor want-3PSIND *for her patient lose-INF weight.*

Some theorists (Ojea, 2005, 2008; Iverson et al., 2008; Radford, 2007) claim that *for-to* infinitival constructions introduce mood as an uninterpretable feature. Iverson et al. (2008) propose a similar process of lexical selection in English to that proposed by Kempchinsky (2009) in Spanish, in which the mood feature occupies the head of Force, as in Spanish, but *for* is in the head of Fin. The preposition *to* occurs in the head of tense of the subordinate clause, as an infinitival form is used. A similar process of feature

---

16 As Pérez-Tattam (2007) mentions, there are a handful of verbs in Spanish that permit optional control of subordinated infinitives in disjoint reference contexts, such as the verbs mandar (to command) or obligar (to oblige). These verbs also permit the subjunctive following que.
checking and deletion transpires in English as in the Spanish intensional subjunctive in the head of Mood. Iverson et al.’s (2008) proposed structure of English for-to infinitival structures is shown in Figure 3.

$$V_{Matrix} \left[ \begin{array}{c}
CP \left[ \text{ForceP Force[uM]} \right] \\
\text{FinP} \left[ \text{for} M \left[ TP \left( DP \right) \left[ T' \to VP \right] \right] \right] \\
\text{feature selection} \quad \text{feature checking}
\end{array} \right]$$

Figure 3. Iverson et al.’s (2008, p. 142) structure of mood in English for-to constructions.

Despite the partial syntactic overlap between English and Spanish in this respect, Iverson et al. (2008, p. 142) clarify that “In the for-to variant, then, it is misleading to speak of the subjunctive mood, if we define mood narrowly as necessarily involving a distinct set of inflectional endings on the verb.” Therefore, perhaps it is not viable to consider English for-to infinitival constructions a true case of subjunctive mood, but its syntactic structure could emerge as an innovative alternative to the Spanish subjunctive, an argument for which I cite empirical evidence in §2.3.4.4.

Iverson et al. (2008) describe that in order to overcome crosslinguistic influence from English, L2L of Spanish must “unlearn” (p. 135, p. 147) the for-to construction and readjust their representation of subjunctive mood in intensional contexts. This involves replacing the interpretable for in the head of Fin with the uninterpretable quasi-imperative operator, and mapping the appropriate subjunctive morphology onto the inflected subordinate verb, rather than using an infinitival structure. Furthermore, in the case of the polarity subjunctive, L2L must learn that the Worlds feature and subsequent subjunctive morphology can be mapped onto predicates such as relative clauses or temporal adverbials depending upon the presupposition of the speaker. If, following Putnam and Sánchez’s (2013) predictions, HS also experience reassembly of features, but based upon the more-dominant L2, these predictions might be extended to Spanish as a HL: HS may
reassemble their mood systems to converge on the similar *for-to* structure of English. In sum, if we follow Iverson et al.’s (2008) syntactic analyses and Putnam and Sánchez’s (2013) activation and reassembly framework for HLs, there is ample room for syntactic transfer from English into Spanish HS’ mood systems, as noted in Perez-Cortes et al. (2019).

### 2.2.4. Summary

In this section, I have presented the most prominent semantic and syntactic accounts of subjunctive mood in Spanish and the similar and “competing” structures in English, which could cause a restructuring of HS’ mood system. Although some theoretical accounts have attempted to dichotomize the distinction between moods, modal bases (e.g., Chung & Timberlake, 1985) have proven fruitful for grouping the subjunctive into multiple semantic functions. From a syntactic perspective, the intensional subjunctive can account for instances of mood use in which co-occurrence of the indicative is purportedly ungrammatical and in which mood is an uninterpretable feature. In contrast, the polarity subjunctive accommodates uses of this mood in which the indicative can occur, but in which mood selection has implications for interpretation. In such contexts, mood is an interpretable feature. As will be seen in the following sections, modal bases and syntactic contexts have been prevalent in research on the acquisitional patterns of subjunctive mood, and are thus essential frameworks for understanding this line of work.

Before continuing, it is important to recognize that some researchers demonstrate that corpus data argue against the semantic and syntactic accounts set forth above. These researchers claim that the subjunctive in Romance languages has been lexicalized, such
that it only occurs following a shrinking list of lexical items (Poplack, 2001; Torres Cacoullos et al., 2017). Following this line of research, there are few syntactic and semantic contributions of mood, such that it occurs probabilistically following a decreasing and fixed list of lexical items. In addition, there are instances in which monolinguals (Serrano, 2004) and even HS (Giancaspro, 2017; Perez-Cortes, 2016) extend the subjunctive to contexts in which theory predicts the use of the indicative mood. Therefore, the approaches to mood highlighted above are useful approximations of the distribution of indicative and subjunctive morphology in Spanish, but mood does not strictly adhere to these theories.

2.3. Research on the Acquisition of the Subjunctive Mood

Based upon the theoretical accounts of the Spanish subjunctive mood reviewed in the previous section, a useful point of departure in exploring the acquisition of this grammatical property is to understand the task that language learners face. Firstly, the acquirer must recognize that the morphological instantiations of subjunctive mood are different from those of the indicative, which involves being aware of the shift in thematic vowel that differentiates subjunctive from indicative morphology, as well as committing the morphologically irregular stems of /er/ and /ir/ verbs to memory. However, simply recognizing the morphological instantiations of mood does not guarantee the acquisition of the syntactic contexts that govern its use, nor of the semantic and pragmatic entailments that are associated with certain functions of this morphological category. For

---

17 Although these researchers provide compelling evidence that instances of subjunctive use may not be categorical, it is unclear how probability could account for uses of the subjunctive such as in relative clauses, where mood contributes novel semantic information.
this reason, Pérez-Leroux (1998) documented that children begin to use subjunctive morphology before they have developed command of all of its syntactic and semantic entailments.

Therefore, acquiring the subjunctive mood also depends on the ability to recognize the multiple syntactic contexts in which it is used. Firstly, speakers must acquire the ability to produce subordinate clauses, as Collentine (2003) points out. Secondly, speakers must learn that coreference requires infinitival complements and that disjoint reference requires a tensed subordinate clause is necessary (Padilla, 1990). However, even when speakers have acquired the morphological entailments and the syntactic prerequisites to mood use, there are still additional layers of competence required to master the use of subjunctive morphology.

The acquisition of the intensional subjunctive requires that speakers acquire the mechanism of lexical selection, including the uninterpretable mood feature. To do so, speakers must compile a mental list of lexical items that subcategorize for the subjunctive in intensional contexts. Then, the speaker must also acquire the uninterpretable [uW] feature and the process of lexical selection depicted in Figure 1. Regarding the polarity subjunctive, the acquirer must first develop the ability to recognize the semantic contrasts implied through the selection of either the subjunctive or the indicative moods. Doing so requires the acquisition of mood as an interpretable feature, which entails feature identification in Force and Mood heads. This process also relies on the pragmatic notion of presupposition, as the ability to recognize speakers’ commitment to the truth value of propositions is essential to interpreting modal alternations and producing them meaningfully. As will be seen in the following sections, the recognition of presupposition
is related to general cognitive development, such that the acquisition of the subjunctive in this context is also contingent upon non-linguistic factors.

As can be seen, the task of acquiring mood in Spanish requires developing the semantic and pragmatic entailments of these inflections, the syntax of lexical selection and of subordinate clauses, the ability to recognize presupposition, and the appropriate morphological realizations of mood. In the following sections, I discuss previous research on how multiple populations acquire this structure. I first focus on the possibility that HS acquire a changing mood system from their caregivers. Next, I concentrate on how monolingual children acquire the subjunctive mood in a context-by-context fashion. I subsequently review the limited previous research on the acquisition of subjunctive mood in bilingual children, and conclude with a review of the extensive literature on this topic in adult HS of Spanish, which includes evidence of crosslinguistic influence from English.

2.3.1. The Role of Dialectal Variation and Input Quality

As discussed in Chapter 1, it is important to evaluate the input that HS receive from Spanish-dominant bilinguals before claiming that innovative uses of subjunctive mood morphology originate in heritage grammars. Therefore, before synthesizing research comparing HS and other populations of native speakers of Spanish, it is useful to explore the input that their caregivers provide to them. That such tendencies could extend to the modal contrast is intriguing in the light of research that has shown that there is a degree of dialectal variation in subjunctive mood use even in monolingual communities (e.g., Faulkner, 2021; Gallego & Alonso-Marks, 2014a, 2014b; Kowal, 2007; Lastra & Butragueño, 2012).
However, data from recent studies evaluating Spanish-dominant speakers have revealed retention of the Spanish subjunctive in these speakers. Giancaspro (2017; see also Giancaspro, 2019) reported that Spanish-dominant comparison participants were at ceiling in the production of the subjunctive in nonpresuppositional relative clauses (polarity subjunctive in the epistemic modal base) and purpose clauses (intensional subjunctive in the deontic modal base). Similarly, Bookhammer (2013; see also Martillo Viner, 2016, 2017, 2018) found that Spanish-dominant participants produced the subjunctive in 99% of volitional clauses, with matrix verbs such as *querer* (*to want*) and in 84% of nonpresuppositional relative clauses.

For this reason, multiple sources have suggested that the contexts of subjunctive mood addressed in the present dissertation (in relative clauses and in volitional clauses) are not subject to change among Spanish-dominant speakers in contact with English, although there is slight variability in relative clauses. This reinforces the notion that other factors are at play in accounting for how HS innovate beyond the input that they receive in Spanish. I now turn to the research literature on monolinguals’ mood systems, which sets the stage for understanding the nature of bilingual acquisition of the subjunctive and for exploring the differences that Spanish HS exhibit when compared to other speaker populations.

However, it is worthwhile to note that these studies have addressed the use of subjunctive mood as a single entity, whereby the characteristics of the matrix clause do not have any bearing on the use of mood in the subordinated relative clause. Giancaspro (2017, 2019) targeted the use of the subjunctive in relative clauses following the phrase *buscar* (*to search for*) + object + *que* (complementizer). The use of the indicative and
subjunctive is grammatical in such situations, but the ease of processing and the
frequency of this matrix verb could potentially heighten HS’ chances in using both
moods. In contrast, Bookhammer’s (2013) data were naturalistic, and encompassed all
uses of relative clauses within a single category. This includes relative clauses such as
those in the present study in which the matrix phrase is longer and not driven by the
presence of a single lexical item (e.g., buscar) that introduces a lack of presupposition in
the resulting object relative clause. As a result, it is not surprising that the latter study
found greater variability in the production of relative clauses, but future research is
necessary to determine if the use of subjunctive in object relative clauses with distinct
matrix phrases varies within the same speaker.

2.3.2. Monolingual Development of Subjunctive Mood

The acquisition of subjunctive mood in monolingual children progresses in a
protracted fashion that spans the childhood years. Modality has proven fruitful for
breaking the lengthy acquisitional timeline of subjunctive mood, as well as that of other
structures that convey modality (Papafragou, 1998; Papafragou & Ozturk, 2007), into
stages. Research shows that speakers first develop command of the subjunctive in
nominal complements in the deontic modal base, followed by adverbial and subsequently
adjectival clauses in epistemic modal base, and complete the acquisition process with
sentential complements that correspond to epistemological modal base.

The first subjunctive inflections emerge in monolingual Spanish-speaking
children by age two (Aguirre, 1995; Montrul, 2004). Between two and three years of age,
children begin using the subjunctive in indirect commands and purpose clauses and with
temporal clauses following cuando (Hernández-Pina, 1984; López-Ornat et al., 1994).
Blake (1983) found that children consistently produced the subjunctive in contexts of the deontic modal base by between ages five and six. Similarly, Dracos et al. (2019) showed that children appear to have adult-like knowledge of the subjunctive in volitional contexts following the verb *querer* (*to want*) by age five, suggesting that mood use in the deontic modal base emerges stably by around the beginning of the school period.

Multiple studies have suggested that use of subjunctive mood in the epistemic and epistemological modal bases takes longer for children to acquire, as there are cognitive prerequisites for doing so. As Montrul & Perpiñán (2011, p. 94) describe, those functions of the subjunctive that require the recognition of presupposition, all of which occur within the epistemic or epistemological modalities, are particularly challenging:

“A problem for the acquisition of mood morphology and the meanings that this grammatical category entail[s] is that these meanings cannot be easily accessed by just observing simple contrasts between utterances and the context. Rather, many uses of mood morphology rest on presupposition, and the possible meanings must be constructed from complex pragmatic inferences.”

Since epistemic modality requires the speaker to select mood by interpreting a possible set of worlds and making pragmatic inferences, it appears that children must first develop the cognitive prerequisites of Theory of Mind, such as false beliefs and wishes. Along this line, Pérez-Leroux (1998) showed that the non-linguistic ability to produce relative clauses with the adult-like modal contrast only weakly correlated with age, but that children who were able to recognize false beliefs were approximately 20 times more likely to use the subjunctive in their production. The oldest children in the experiment were aged 6;11, and some participants had not yet reached ceiling on the Theory of Mind test, which suggests that the development of the modal contrast with these structures continues through at least age 7. Sánchez-Naranjo and Pérez-Leroux (2010) also found a
weak correlation between Theory of Mind development and use of the subjunctive in adverbial clauses, which also pertain to the epistemic modal base.\textsuperscript{18}

These findings are consistent with two recent studies. Firstly, Dracos et al. (2019) studied 66 typically-developing monolingual children in Argentina between ages four and ten. Participants between six and seven years of age were able to reliably produce the subjunctive in contexts of nonpresupposition in relative clauses, while younger participants did not do so consistently. Secondly, Ahern and Torrens (2021) replicated these findings by carrying out two Theory of Mind tasks, a false belief task, and a wishes task, and eliciting subjunctive morphology in deontic and epistemic contexts with 40 monolingual children in Spain between three and seven years of age. The researchers found that mood selection in \textit{both} deontic and epistemic modalities correlated with participants’ ability to recognize false beliefs and wishes, but that the correlations with the two Theory of Mind tasks were more robust for predicates in the later-acquired epistemic modal base. Children appeared to use more subjunctive mood in nominal complements in the deontic modal base than in adverbial clauses in the epistemic modal base, which is consistent with previous research.

The final component of subjunctive mood that emerges in monolingual children is that which occurs in sentential complements that express the epistemological modal base in nonassertive and factive-emotive predicates. The use of subjunctive mood in these contexts requires the recognition of the sentential subject’s commitment to the truth value of the proposition, rather than that of the speaker. Dracos et al. (2019) reported that only

\textsuperscript{18} The researchers mentioned that their participants had low socioeconomic status, and that socioeconomic status correlates with Theory of Mind development. Therefore, it is possible that participants’ background affected the strength of this correlation.
the oldest children in their study, between nine and ten years of age, were able to consistently use the subjunctive mood in contexts of nonassertion following the negated epistemic predicate *no creer* (*to not believe*). Similarly, Blake (1983) reported that subjunctive mood use stabilized in nonassertive predicates when participants reached ten years of age, and production of mood in these contexts continued to stabilize with factive-emotive predicates until participants reached twelve years of age.

To summarize, monolingual development of the subjunctive is a lengthy and intricate process. Although children appear to produce subjunctive morphology from a very early age, around their second birthday, the acquisition of the adult-like distribution of indicative and subjunctive mood proceeds over the following decade. The framework of modal bases (Chung & Timberlake, 1985; Kratzer, 1981, 1991, 1998) has proven useful in grouping the syntactic contexts of subjunctive use into periods of development. Deontic predicates such as indirect commands and volitional clauses, along with a handful of adverbial clauses such as *cuando*, emerge by the beginning of the school period. However, the development of multiple uses of subjunctive in the epistemic and epistemological modal bases extends well beyond the start of schooling in monolingual development and has cognitive prerequisites. Most such cases fit into the polarity subjunctive, but some of these contexts of subjunctive are also intensional.

These studies depict how complex the development of the subjunctive is for monolingual children. Needless to say, these children do not confront coactivation of two languages or rapid decreases in input around the onset of the school period. Therefore, bilinguals plausibly face an even greater challenge in the development of subjunctive mood morphology, and uses of the subjunctive acquired after schooling begins may be
more vulnerable to restructuring in heritage grammars than those that are developed earlier.

2.3.3. Bilingual Childhood Development of Subjunctive Mood

There are five studies that shed some light on subjunctive mood in English-Spanish bilingual children, two of which are longitudinal case studies with young children. Only one of these studies specifically targets the acquisition of the subjunctive mood (Dracos & Requena, 2022). In the first case study, Silva-Corvalán (2014) described her two grandsons’ development of the Spanish verbal system in a bilingual household. Her two grandsons, Nico and Brennan, were born in the United States, spoke English at home with their mother, and generally spoke Spanish with their father and with her. Nico, Silva-Corvalán’s older grandson, received approximately one third of his input before the school period in Spanish, and developed tense, mood, and aspect systems that were qualitatively similar to that of Daisy, a Spanish-dominant bilingual child, and even Rego, a monolingual child in Chile. Nico’s first use of the subjunctive emerged at age 2;6 and continued to develop, albeit with occasional substitutions of the indicative, until the conclusion of the study, at which point he was six years old. In contrast, Silva-Corvalán’s second grandson, Brennan, had cumulatively less exposure to Spanish. Interestingly, Brennan produced his first subjunctive utterance at 2;5, one month earlier than his brother, but the substitution of indicative and infinitival forms became increasingly common. By age five, there was not a single instance of subjunctive mood morphology in Brennan’s production, concurrent with a decrease in his exposure to Spanish.

In the second case study, Anderson (2001) studied the lexical and morphological development of two sisters, Beatriz and Victoria. Unlike Nico and Brennan, the two
sisters moved from Puerto Rico to the continental United States while they were toddlers, aged 3;6 and 1;6, respectively. Both parents were bilingual and used Spanish at home. Unlike in the case of Silva-Corvalán’s grandchildren, Victoria, the younger sibling, experienced greater grammatical growth in the formative years because she interacted with a Spanish-speaking preschool teacher. Across a two-year period, Victoria’s mood error rate was 36.2%, while Beatriz’s was 44.7%. These error rates were the second highest in the dataset, following person/number agreement. Intriguingly, Victoria’s mood errors decreased across experimental sessions, while they remained persistent in Beatriz’s production. Therefore, it appears that at least within the time intervals studied, Silva-Corvalán (1994) and Anderson (2001) concur that bilingual children acquiring two first languages experience a more protracted process of mood development when compared to monolinguals.

There are also experimental studies that have evaluated the use of the subjunctive in older bilingual children. In the first, Merino (1983) reported longitudinal data from 32 bilingual children in primary school. The researcher found that production of the subjunctive mood had decreased from 70% accuracy across participants to 55% after two years. Additionally, Potowski (2007a, 2007b) explored the acquisition of subjunctive mood in 30 HS enrolled in the eighth grade of an bilingual immersion program. In this particular experiment, Spanish HS completed a six-item written production task, in which each context evaluated the use of a single type of subjunctive mood use: two nominal complements following pedir (to ask for) and es imposible que (it is impossible that),

---

19 The breakdown of children’s ages was not reported in the participant data; however, children were enrolled in the primary grades (K-4) during the first experimental session.
with the temporal adverb *cuando* (*when*) in a purpose clause following *para que* (*so that*), an adjectival object relative clause following the verb *buscar* (*to search for*), and a sentential complement following *gustar* (*to like, to please*). The type of subjunctive, clause, and modal base of each of these predicates is summarized in Table 1, and percentages of HS’ mood selection are summarized in.

<table>
<thead>
<tr>
<th>Item</th>
<th>Clause type</th>
<th>Modal base</th>
<th>Syntax</th>
<th>Subj. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gustar</td>
<td>Sentential complement</td>
<td>Epistemic</td>
<td>Intensional</td>
<td>28/31 (90%)</td>
</tr>
<tr>
<td>Purpose clause</td>
<td>Adverbial</td>
<td>Deontic</td>
<td>Intensional</td>
<td>26/31 (84%)</td>
</tr>
<tr>
<td>Pedir</td>
<td>Nominal</td>
<td>Deontic</td>
<td>Intensional</td>
<td>25/31 (81%)</td>
</tr>
<tr>
<td>Ser imposible</td>
<td>Nominal</td>
<td>Epistemic</td>
<td>Intensional</td>
<td>21/31 (68%)</td>
</tr>
<tr>
<td>Relative clause</td>
<td>Adjectival</td>
<td>Epistemic</td>
<td>Polarity</td>
<td>19/31 (61%)</td>
</tr>
<tr>
<td>Cuando</td>
<td>Adverbial</td>
<td>Epistemic</td>
<td>Polarity</td>
<td>17/31 (55%)</td>
</tr>
</tbody>
</table>

Table 1. Percentage of participants who used subjunctive mood in each context in Potowski (2007a, p. 151).

These HS were most accurate using the subjunctive on the cloze measure with the three nominal clauses and with purpose clauses. It should be noted that these four contexts represented the intensional subjunctive in which indicative mood would be ungrammatical in accordance with prescriptivist theory. In contrast, HS were least accurate with *cuando* adverbials and with object relative clauses. The participants were therefore most accurate in using the subjunctive in intensional contexts that did not require pragmatic processing, which could potentially be interpreted as support for the Interface Hypothesis as described in Chapter 1. In contrast, the Spanish-dominant bilinguals used the subjunctive with 100% consistency across contexts, suggesting that each sentence was appropriately contextualized to favor subjunctive use.

Merino’s (1983) and Potowski’s (2007a, 2007b) studies provide invaluable information on grammatical development in educational contexts, so I will return to them in Chapter 3, which concentrates on immersion schooling. However, these data were part
of larger-scale analyses of multiple morphosyntactic structures and used descriptive statistics only. Consequently, the only experimental study that has concentrated specifically on the subjunctive in child HS of Spanish is Dracos and Requena (2022). In this study, the researchers explored Spanish HS’ production of subjunctive mood in volitional and adverbial contexts with 50 children between four and fifteen years of age. Results from a sentence completion task revealed that overall proficiency and, to a lesser degree, patterns of home language use and exposure shaped HS’ knowledge of mood in volitional and adverbial contexts. There was an advantage for volitional clauses that pertain to the deontic modal base over adverbial clauses in epistemic modal base. However, there was no substantial difference between *cuando* (polarity subjunctive) and *antes de que* (intensional subjunctive), which suggests that the modal base of the predicate matters more than the type of subjunctive in accounting for the acquisitional patterns of HS. This is consistent with recent research on adult HS (Lustres et al., 2020; Perez-Cortes, 2021b), which will be reviewed in §2.3.4.2. However, there was no effect found for age, which argues against protracted development of subjunctive mood.

Before turning to research on adult HS, it is worthwhile to review a similar study carried out by Flores et al. (2017) concerning the acquisition of mood by European Portuguese HS in Germany. In this experiment, 50 HS between six and sixteen years of age participated in a production task similar in design to that in Dracos and Requena’s (2022) study. These researchers found that sequential bilingual children who spoke Portuguese with their parents and siblings showed considerable growth in their production of subjunctive mood between ages eight and twelve, while simultaneous bilingual children in bilingual households showed similar growth after age thirteen. The
HS with bilingual parents and older siblings converged on similar rates of subjunctive mood as those who exclusively used Portuguese with their families, despite taking longer to reach this stage. Both groups eventually produced the subjunctive in around 80% of expected contexts, suggesting that they had closed the gap on a group of monolingual children who had been studied using the same experimental task (see Jesus, 2014). In a follow-up study that compared a subset of the German-speaking HS with an age- and exposure-matched French-speaking group, Flores et al. (2019) found no advantage for the French group despite the considerable overlap between the French and Portuguese subjunctive. Therefore, the researchers concluded that crosslinguistic influence did not affect development.

These findings are important because they show that it is likely that the amount of exposure that children receive impacts the rate of acquisition of mood. However, it should be noted that the German-speaking children who participated in Flores et al. (2017, 2019) were students at an afterschool Portuguese HL program, but despite this sustained exposure, only parental and sibling input shaped their mood morphology development. It should be noted that, despite protracted development compared to the monolingual speakers of European Portuguese studied by Jesus (2014), these bilinguals did produce levels of subjunctive mood in pre-adolescence or adolescence that monolinguals in Jesus (2014) had reached earlier in childhood. Although the HS children did not converge on monolingual levels of mood use, it is impossible to determine whether sustained exposure to formal registers of Portuguese in an afterschool program contributed to this development without a comparison with children who did not attend this program. Nevertheless, Dracos and Requena’s (2022) and Flores et al.’s (2017, 2019)
studies reinforce the importance of exposure throughout childhood in the acquisition of the subjunctive.

Although the knowledge of the Spanish subjunctive in child HS remains limited, there are some generalizations that can be made. Firstly, HS do not use as much subjunctive as age-matched monolinguals. Secondly, it appears that input quantity influences the development of subjunctive mood. These findings are consistent with studies on subjunctive mood with adult HS, which has accumulated far more research than in children. In the following section, I offer a detailed review of these studies.

2.3.4. Acquisition of Subjunctive Mood in Adult Spanish Heritage Speakers

The subjunctive has received considerable attention in experimental and sociovariationist research on adult HS of Spanish for multiple reasons. Firstly, the multiple layers of competence that are involved in subjunctive mood morphology are opportune for exploring how the factors reviewed in Chapter 1 affect acquisition more generally. Additionally, subjunctive morphology is instantiated on lexical items, which means that form regularity and lexical frequency can be carefully manipulated to explore how these variables affect mood use.

Intergenerational studies on Spanish speakers in New York City (Birnbaum, 2019; Bookhammer, 2013; Torres, 1989), Miami (Lynch, 1999), Los Angeles (Ocampo, 1990; Silva-Corvalán, 1994), Illinois (Martínez-Mira, 2006), upstate New York (Lantolf, 1979), and New Mexico (LaCasse, 2018; Martínez-Mira, 2006) have shown that later generations of speakers in the United States who are HS – that is, children and grandchildren of Spanish speakers raised outside of the United States – produce fewer instances of subjunctive mood morphology than Spanish-dominant participants. Although
these findings on the surface appear to suggest a simplification or loss of mood morphology, a closer evaluation indicates that despite considerable individual variation, HS as a group retain robust, albeit different, knowledge of the subjunctive mood and are still able to use these inflections in multiple syntactic contexts. Such findings are principally based upon oral interview data from sociovariationist research that draws data from naturalistic and communicative contexts. Nevertheless, experimental studies are necessary to complement these findings, as these approaches can investigate specific contexts of subjunctive use and are able to capture knowledge about HS’ production and comprehension (see Gregg, 1990 or Rothman, 2007), which can become uncoordinated in HLs (Perez-Cortes et al., 2019). Because I adopt an experimental approach to mood morphology, I will concentrate principally on this area of research, but it is important to recognize that these two methodologies complement one another in informing our knowledge of this topic.

2.3.4.1. Differences between Polarity and Intensional Subjunctive. Montrul (2007, 2009) conducted the first experimental studies that focused specifically on HS’ knowledge of subjunctive mood. Through oral production, written sentence completion, and scalar judgment tasks, Montrul concluded that HS’ knowledge of subjunctive mood is modulated by their overall morphosyntactic proficiency. The written sentence completion task targeted the intensional subjunctive, which she termed obligatory contexts, due to the prescriptively mandatory use of subjunctive with these stimuli. The judgment task required participants to rate minimal pairs of sentences (one containing each mood) on a scale of -2 to 2 in temporal clauses with cuando, adverbial clauses with de manera que, and relative clauses, all of which she claimed represent variable contexts
of polarity subjunctive due to the possible co-occurrence of the indicative. Montrul found that HS across proficiency levels had greater difficulty with variable contexts of subjunctive mood in the judgment task. She claimed that her results point to HS’ incomplete acquisition of the subjunctive, especially in polarity contexts, because of their lower levels of sensitivity to the distinction between moods. On the surface, these findings could constitute evidence for the Interface Hypothesis (as reviewed in Chapter 1), because the variable nature of mood selection in pragmatically-conditioned contexts proved to be more difficult for her participants to recognize.

Montrul and Perpiñán (2011) used similar cloze and judgment tasks and reported findings consistent with those found in the earlier studies. In this experiment, HS were compared to proficiency-matched Spanish L2L. The researchers found that L2L across proficiency levels were more likely to produce and accept subjunctive morphology than HS, which they attributed to the metalinguistic nature of the tasks (as discussed in Chapter 1) and the explicit instruction in Spanish that L2L frequently receive that HS often do not. Importantly, however, across both of these studies, intensional contexts were addressed in the cloze task and polarity contexts in a judgment task. Therefore, it is impossible to distinguish between the nature of the experimental task and the type of subjunctive mood in these analyses.

To address the effect of task versus interface variability, van Osch and colleagues (van Osch & Sleeman, 2018; van Osch et al., 2017, 2018) explored subjunctive mood knowledge of 27 HS of Spanish in the Netherlands. In these experiments, the researchers reported similar findings to Montrul’s using an oral elicited production task and an acceptability judgment task; each task tapped multiple types of subjunctive mood use.
Specifically, the researchers concluded that HS exhibited greatest variability in the use of the subjunctive mood in negated epistemic predicates, followed by relative clauses. Participants had the most robust production and judgments of mood in intensional contexts. The authors claimed that these results support the Interface Hypothesis because of the differing degrees of accuracy with which HS used the subjunctive in each context.

Finally, Giancaspro (2017) tested 42 HS of intermediate and advanced proficiency levels in their knowledge of intensional subjunctive in purpose clauses with the prepositional complementizer *para que* and of polarity subjunctive in relative clauses using elicited production, forced choice, and acceptability judgment tasks. He found that HS were more variable in the production and interpretation of subjunctive mood in relative clauses in which pragmatic presupposition is required. Participants who had later ages of onset of acquisition of English and who had higher proficiency in the HL were more likely to produce the subjunctive mood overall. Giancaspro also reported that the use of the subjunctive in intensional contexts was conditioned by lexical frequency, such that more-frequent subordinate verbs were more likely to result in subjunctive use.

The results reported across these studies may be interpreted as lending support to the Interface Hypothesis because the “variable” nature of polarity subjunctive appears to bring about greater levels of optionality in HS’ mood tendencies than the categorical nature of intensional predicates that do not require pragmatic processing. However, a closer analysis leads to three comments. The first relates to exactly how to operationalize the nature of interfaces, as discussed in Chapter 1. For example, van Osch et al. (2017) claimed that relative clauses are part of the *internal* interface between syntax and semantics; however, as mentioned previously, Pérez-Leroux (1998) demonstrated that
mood use is contingent upon Theory of Mind, which is a pragmatic factor, and not a semantic one. Additionally, there is a list of matrix items that subcategorize for subjunctive mood, such that there is a lexico-semantic component to the intensional subjunctive as well.

The second consideration is whether the variability that HS exhibit is due to the difficulties in integrating pragmatic and semantic layers of competence, as spelled out in the Interface Hypothesis, or merely to the later acquisition of these instances of subjunctive mood use in monolingual contexts. This argument may appear to be tautologous, because children acquire the pragmatically-conditioned contexts of mood use later than intensional contexts precisely because of their difficulty. However, this is because children do not have the cognitive prerequisites for using mood in adverbial (Pérez-Leroux & Sánchez-Naranjo, 2010) and adjectival (Pérez-Leroux, 1998) clauses in the epistemic modal base until they master the ability to recognize false beliefs, which often takes place after the school period begins, around age five (Blake, 1980; Dracos et al., 2019; Pérez-Leroux, 1998). Therefore, HS may experience protracted development of these uses of the subjunctive due to a decrease in exposure to Spanish around this period. As such, it is unclear whether interface vulnerability is at the root of difficulties in HS’ knowledge of Spanish, or if the later-acquired contexts of subjunctive mood develop at a time when HS are experiencing more considerable pressures from the influence of English.

Thirdly, as reported in monolingual acquisition literature both on mood (e.g., Ahern & Torrens, 2021; Blake, 1980; Dracos et al., 2009; Pérez-Leroux, 1998; Sánchez-Naranjo & Pérez-Leroux, 2010) and other areas of modality (Papafragou, 1998;
Papafragou & Ozturk, 2008), the modal base of the predicate has an important impact on L1 development. In the previous studies with adult HS, the modal base was not part of the experimental design, which raises questions about whether semantic or pragmatic factors – or both – are at the heart of optionality in HS’ mood systems. Because of this, Montrul and Giancaspro do not claim that their results clearly constitute evidence for the Interface Hypothesis. Since modal bases can account for the acquisitional timeline in the monolingual acquisition literature, recent studies have sought to establish that this factor may prove more useful in explaining variability in HS’ acquisition and knowledge of mood.

2.3.4.2. **The Role of Modal Bases.** Two recent studies in HL acquisition reveal the importance of this consideration within this line of research. Perez-Cortes (2016) conducted a study on 69 HS of a range of proficiency levels, in which participants completed a truth value judgment task, a grammaticality judgment task, and a sentence completion task targeting mood alterations with communication verbs such as decir (to say/to tell) and repetir (to repeat), as well as following other volitional verbs such as querer. Communication verbs such as decir are known as verba dicendi and accept indicative complements in contexts of reported speech such as (15) and subjunctive complements in contexts of directives such as (16). Directives are a context of polarity (variable) subjunctive,20 while volitional verbs comprise an intensional context, but all pertain to the deontic modal base.

(14) La vecina del quinto les dice a sus hijos que son amables.

---

20 Perez-Cortes (2016, 2022) points out that theorists like Gielau (2015) claim that there are separate lexical entries for homophonous verbs that accept either an indicative or a subjunctive compliment. Readers are referred to Perez-Cortes (2016, p. 16) or Perez-Cortes (2021b, p. 3) for further discussion as to why this does not appear to be the case.
The neighbor of the fifth CL.3 PL says to her children that be-3PL.ind kind
The fifth-floor neighbor says to her children that they are kind.
Reported speech context from Perez-Cortes (2021a, p. 3, gloss mine)

(15) La vecina del quinto les dice a sus hijos que sean amables.
The neighbor of the fifth CL.3 PL says to her children that be-3PL-subj kind
The fifth-floor neighbor tells her children to be kind.
Directive context from Perez-Cortes (2021a, p. 3, gloss mine)

Across tasks, Perez-Cortes (2016) reported that there was no effect found for the obligatory versus variable distinction reported in previous studies when controlling for modal base; participants showed nearly identical use of the subjunctive in volitional clauses with intensional predicates when compared to mood alterations with verba diciendi that admit both the indicative and subjunctive. Table 2 summarizes these HS participants’ mood production tendencies by proficiency level.

<table>
<thead>
<tr>
<th>Group</th>
<th>Intensional/obligatory</th>
<th>Polarity/variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermediate HS</td>
<td>62.7%</td>
<td>62.7%</td>
</tr>
<tr>
<td>Advanced HS</td>
<td>93.8%</td>
<td>93.7%</td>
</tr>
</tbody>
</table>

Table 2. Percentage of HS’ subjunctive production by context and proficiency in Perez-Cortes (2016).

In a subsequent analysis, Lustres (2018; see also Lustres et al., 2020) reported similar findings concerning epistemic modal base, in which ten HS carried out sentence completion, forced choice, and acceptability judgment tasks. In these tasks, Lustres selected four matrix items, all of which were adverbial and part of the epistemic modal base: two concessive adverbs, including one intensional item (aun a riesgo de que, even at the risk of) and one polarity item (aunque, even though), and two temporal adverbs, including one intensional item (antes de que, before) and one polarity item (cuando, when). Lustres reported that participants did not show marked differences between use of the intensional and polarity conditions. Table 3 summarizes the results across speakers.

<table>
<thead>
<tr>
<th>Adverbial type</th>
<th>Obligatory subjunctive</th>
<th>Variable subjunctive</th>
</tr>
</thead>
</table>
The consistencies across Lustres’ (2018) and Perez-Cortes’ (2016) data suggest that modal bases play an important role in HS’ acquisition process. There do not appear to be interface effects when holding the modal base of the predicate constant, which suggests that semantic factors, but not syntactic ones, condition the order of acquisition of the different contexts of subjunctive mood. In order to truly differentiate between interface and the semantic effects described above, future studies will need to incorporate intensional and polarity predicates into multiple modalities, as Lustres et al. (2020) and Perez-Cortes (2021a) state. While these studies as well as those reviewed in the previous section have broadened our knowledge of intraspeaker variability regarding the types of subjunctive that HS use most frequently, recent research has increased the grain even further in exploring HS’ mood systems.

### 2.3.4.3. Between-Speaker and Intraspeaker Variability

To this effect, multiple studies have revealed an even more systematic nature of the variability within HS’ use of mood morphology. For instance, Perez-Cortes (2016) reported that morphosyntactic proficiency, frequency of use of Spanish, and age of acquisition interact in affecting HS’ subjunctive mood tendencies. Specifically, frequency of use of Spanish accounted for differences in subjunctive mood use between similarly-proficient bilinguals. Additionally, López-Beltrán Forcada (2021) used principal component analysis to evaluate the key extralinguistic factors that conditioned subjunctive mood knowledge in 33 HS living in New Mexico. The researcher reported that those HS who were more frequent users of Spanish, had a larger social network of speakers, and who reported

<table>
<thead>
<tr>
<th></th>
<th>Concessive clauses</th>
<th>Temporal clauses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aun a riesgo de que – 53%</td>
<td>Antes de que – 58%</td>
</tr>
<tr>
<td></td>
<td>Aunque – 60%</td>
<td>Cuando – 65%</td>
</tr>
</tbody>
</table>

**Table 3.** Percentage of subjunctive across conditions by adverbial item in Lustres (2018).
having strong identities as Spanish speakers were more likely to produce and process the subjunctive mood like Spanish-dominant bilinguals who also participated in her experiment.

In addition to exploring the differences between speakers, Perez-Cortes’ (2016) data provide insights into production-comprehension asymmetries as well. Less-proficient and less-frequent users experienced greater asymmetries between production and comprehension (see Perez-Cortes et al., 2019 for a discussion of these data), suggesting that HS’ receptive knowledge often exhibited greater sensitivities to subjunctive than was observable in their production. Therefore, these data provide a nuanced account of an additional source of intraspeaker variability: HS sometimes exhibit asymmetrical knowledge of mood in production and comprehension, and proficiency and patterns of use modulated these findings.

Secondly, it appears that lexical frequency shapes HS’ knowledge of subjunctive mood. Firstly, Giancaspro (2020) found that HS at both intermediate and advanced proficiency levels were more likely to produce the intensional subjunctive in purpose clauses following para que (so that) when the subordinate verb was more frequent. The same tendencies also influenced performance on a receptive task, but participants showed greater sensitivity to lexical frequency in production. Additionally, Perez-Cortes (2022) found that intermediate proficiency HS were more likely to produce the subjunctive following the more frequent matrix verb decir (to say/to tell) than the verb repetir (to repeat), suggesting that the frequency of the lexical item in the main clause also influences rates of subjunctive mood production. Finally, López-Beltrán Forcada (2021) found that HS in her experiment were more likely to produce the subjunctive following
matrix items that resulted in the highest percentages of subjunctive use in the *Corpus sociolinguístico de la Ciudad de México* (Martín Buitragüeño & Lasta, 2015). In this experiment, participants also showed greater sensitivity to mood as a function of the frequency of subjunctive use with matrix items in a pupillometry processing task.

A third and final consideration that accounts for intra-speaker variability in mood use is morphological regularity, which has been explored in three studies. Giancaspro et al. (2022) conducted a study with 42 Spanish HS of intermediate and advanced proficiency regarding the effects of morphological regularity on the production of subjunctive mood. The researchers designed an elicited production task that targeted the use of the subjunctive with regular and irregular –er and –ir subordinate verbs following the intensional matrix item *querer*. 88% of speakers who alternated between moods in the subordinate clause were on average 35% more likely to produce the subjunctive with irregular verbs than with regular ones. Similarly, Perez-Cortes (2022) described that intermediate proficiency HS produced the subjunctive mood more consistently with irregular subordinate verbs. Intriguingly, the same factor accounted for variability in participants’ truth value judgments of sentences, such that it also appears to impact interpretation, a receptive skill. Lastly, López-Beltrán Forcada (2021) also reported that the HS in her study were more likely to produce the subjunctive and show sensitivity to mood in oculomotor processing with irregular subordinate verbs.

The results of these studies suggest that subjunctive mood morphology remains robust in Spanish as a HL. In fact, Giancaspro (2017) reports that some HS produce subjunctive in relative clauses that expectedly favored the indicative, while Perez-Cortes (2016) reported similar tendencies for HS of advanced proficiency in using the
subjunctive in contexts targeting reported speech. These researchers argue against incomplete development of the HL because they offer evidence that HS have acquired the mood feature, but may not use it in some contexts, with certain lexical items, or in production. Factors such as frequency of use and proficiency also appear to affect HS’

degree of sensitivity to these variables.

Because of their sensitivity to all of these factors, which do not affect monolingual grammars, HS’ knowledge of mood is in some respects more complex than that of other groups of Spanish speakers (see Laleko & Kisselev, 2021 and contributions within concerning complexity in HLs). In contrast to incomplete acquisition, these findings offer support for Putnam and Sánchez’s (2013) feature-based Activation Hypothesis, through which those lexical items that are activated more frequently or that are irregular are more prominent in the memory and thus are more likely to conserve subjunctive mood inflections, particularly under the taxing process of language production. While these factors provide invaluable information about the nuances of HS’ inflectional systems, a final consideration relates to what HS produce in place of the subjunctive when they omit these forms in contexts in which this mood is expected.

2.3.4.4. The Role of Crosslinguistic Influence. Experimental studies have consistently reported that HS most typically produce indicative forms in place of the subjunctive mood (e.g., Giancaspro, 2017; López-Beltrán Forcada, 2021; Montrul, 2007, 2009; Montrul & Perpiñán, 2011; Pascual y Cabo et al., 2012; Perez-Cortes, 2016; van Osch et al., 2017, 2018; van Osch & Sleeman, 2018). This suggests that HS recognize the need for a tensed subordinate clause in cases of disjoint reference in these instances. However, Montrul (2009) and Perez-Cortes (2016) report that HS occasionally produce
structures that are similar to English *for*-to infinitival constructions, as proposed in §2.2.3. Research has amply documented that L2 structures can transfer into the L1 in contexts of bilingualism (e.g., Cook, 2003; Pavlenko & Jarvis, 2002; Seliger, 1996).

Perez-Cortes’ (2016) data provide evidence that lower-proficiency Spanish HS indeed have English-like mood knowledge, as these speakers produced control structures in contexts of disjoint reference such as (16), which would be unexpected or even incomprehensible in monolingual Spanish. Specifically, the speakers use the preposition *a* (*to*) to join the matrix verb with the infinitival form following the insertion of an overt subject, as in English *for*-to constructions. Such a construction exemplifies a bilingual alignment whereby HS may rely on syntactic representations in English during production in Spanish (Sánchez, 2019).

(16) El cocinero quiere sus clientes *a escoger todos los ingredientes*

*The cook wants his clients to choose all the ingredients.*

(Perez-Cortes, 2016, p. 189; gloss mine)

Therefore, it appears that the influence of the English correlates of mood may sometimes capture the differences that HS exhibit when compared to other populations of Spanish speakers.

**2.3.5. Summary of Findings in Acquisition**

Research on the acquisition of subjunctive mood in Spanish has shown that monolingual development spans the childhood years. The modal base of the predicate as well as the type of structure (nominal, adverbial, and relative clauses and sentential complements) are useful in explaining the piece-by-piece acquisition of this property. Deontic predicates such as those with the volitional verb *querer* are stable in monolingual acquisition by age five; however, acquisition of the pragmatic prerequisites for using the
subjunctive within the epistemic and epistemological modalities are contingent upon Theory of Mind. It is thus not surprising that the earlier-acquired structures of subjunctive mood, such as reported directives, purpose clauses, and volitional complements, are the most robust in Spanish HS’ mood systems. In general, research suggests that age of acquisition, frequency of use of Spanish, and morphosyntactic proficiency all account for differences in knowledge of mood between speakers, and production-comprehension asymmetries, lexical frequency, and morphological regularity can explain variability within a single speaker’s grammatical knowledge. In cases where HS do not produce the subjunctive, they generally produce and select the indicative; however, there are instances of crosslinguistic influence that suggest the reliance on English-like for-to infinitival constructions (Montrul, 2009; Perez-Cortes, 2016). Despite HS’ variability in using the subjunctive, it remains productive in Spanish-dominant bilinguals living in the United States, which argues against the possibility that these individuals provide input to HS that contains an already-evolving mood system.

This body of research has not only provided an intricate account of how Spanish HS develop subjunctive mood, but has also contributed to our knowledge of HL acquisition theory more generally.\textsuperscript{21} However, data on bilingual childhood acquisition of the subjunctive is limited. Because the school period represents a decrease in the frequency of exposure to Spanish, an additional and as yet unexplored factor in this line of research is the role of educational experiences on the development of this area of Spanish grammar. In the following section, I discuss the rationale for studying the

\textsuperscript{21} Giancaspro’s and Perez-Cortes’ studies are the first projects to my knowledge that have evaluated the impact of lexical frequency and morphological regularity in HL research.
subjunctive, which comprises a structure that could be particularly dependent upon bilingual schooling, within the context of immersion schools.

2.4. A Role for Bilingual Education

Because linguistically-oriented research on bilingual education is still in its nascent stages, little is known about which specific grammatical structures or areas of vocabulary benefit most from bilingual schooling. As Pires and Rothman (2009b) have shown, home registers of the HL may not contain certain structures that are more common in formal registers spoken in monolingual communities with access to schooling in that language. It is possible that the subjunctive is one such property, as its acquisition continues through approximately the same age at which monolingual Brazilian Portuguese children master inflected infinitives, likely due to explicit instruction at school (Pires & Rothman, 2009a). In the following section, I discuss multiple sources of evidence that suggest that the subjunctive comprises a structure that would be similarly impacted by the sustained exposure to the HL in bilingual schools.

As has been reviewed in the previous sections, monolingual children’s development of the subjunctive spans most of the childhood years and into pre-adolescence. Sustained input in Spanish throughout the school day – and at home – provides bilinguales with more consistent exposure to Spanish at an age when monolingual children, who do not experience the reduction in input that is characteristic

---

22 Individual speakers can, of course, show great variability in frequency of use outside of school, which complicates the comment that HS in bilingual education programs always receive more exposure than their peers. However, the school period typically represents a dramatic drop in input in the HL (Wong-Fillmore, 1991), such that on average, children in monolingual education programs experience less input than their bilingually-educated peers.
of HL acquisition, also continue to experience optionality in their use of the subjunctive-indicative modal contrast (Blake, 1983; Dracos et al., 2019; Pérez-Leroux, 1998). The amount of exposure during the time in which monolinguals continue to master epistemic and epistemological uses of subjunctive mood differs substantially for HS in immersion and their peers in conventional monolingual classrooms. Therefore, on the basis of exposure alone, immersion plausibly benefits HS’ acquisition of this structure.

Since subjunctive development in HS children is sensitive to patterns of exposure (Dracos & Requena, 2022; Flores et al., 2017; Silva-Corvalán, 2014), it is logical that sustained exposure to the HL at school is necessary to fortify knowledge of the subjunctive mood. Results from Montrul and Perpiñán’s (2011) study in which L2L outperform proficiency-matched HS in their production and judgments of modal contrasts entertains this possibility. As the authors state (p. 123, citation original), “If Blake (1983) found that the full spectrum of subjunctive uses are not controlled until monolingually-raised Spanish-speakers reach age 13, then this suggests that a great deal of subjunctive acquisition takes place during the elementary school period.” Montrul and Perpiñán also discussed that monolinguals and especially L2L often receive explicit or metalinguistically-oriented instruction about grammar. The researchers concluded that the advantage for L2L in using the subjunctive stemmed from their instructional experiences, as HS tend not to receive explicit instruction on or academic content in their HL. Kupisch and Rothman (2018) also emphasize that even in the absence of explicit instruction, the additional input and academic instruction in the HL explained why HS of French who attended a bilingual secondary school, but not HS of Italian at a monolingual
secondary school, showed command of multiple grammatical properties that patterned with that of bilinguals dominant in the same language.

An additional source of evidence for the role of bilingual education in the acquisition of subjunctive mood stems from Hulstijn’s (2011) model of language cognition. According to Hulstijn’s account, all L1 speakers share basic language cognition (BLC), which encompasses high-frequency lexical items and frequent morphosyntactic structures. However, following Hulstijn, not all L1 speakers develop the same degree of higher language cognition (HLC), which includes low-frequency vocabulary and infrequent morphosyntactic structures that are necessary in academic and professional contexts. HLC is developed through formal education. The distinction between BLC and HLC may draw support from research carried out by Dąbrowska and colleagues (Andringa & Dąbrowska, 2018; Dąbrowska, 2008, 2010, 2018; Dąbrowska & Street, 2006; Street & Dąbrowska, 2010), in which monolingual speakers’ educational level accounted for differences in interpretation of complex structures in their L1.

Perhaps a better-known model concerning language use is that of Cummins (1980a, 1980b), who distinguishes between basic interpersonal communication skills (BICS) and cognitive academic language proficiency (CALP). However, as Hulstijn (2011, p. 293) states, his model makes more specific predictions about language production and processing:

My definition of BLC is much more specific than Cummins’s definition of BICS, in that it explicitly refers to the distinction between language reception and production, to the distinction between representation and online processing of linguistic information, and to particular linguistic domains (phonetics, prosody, phonology, morphology, syntax, and the lexicon).

While Cummins’ taxonomy has made invaluable contributions to educational approaches to language development, Hulstijn’s model makes more specific predictions regarding the processing and production of language.
There are multiple reasons that the subjunctive would be a structure that requires HLC following Hulstijn’s definition. The first is the frequency of this grammatical structure, as it represents only 7.2% of verbal inflections in Spanish (Biber et al., 2006). Second is the syntactic environment in which the subjunctive is used, given it almost always occurs in complex sentences with subordinate clauses. Finally, this structure (at least in intensional contexts) does not have high degrees of semantic importance. As a result, it meets Hulstijn’s criteria of a structure involved in HLC that might only be developed through formal education.

There are currently no national standards for bilingual education, which makes it challenging to pinpoint precisely which grammatical structures are prevalent in immersion classrooms. Lee (2017, 2018) describes the difficulty faced in aligning content learning objectives with national English language arts learning standards, which further complicates the task of charting the course of language development in bilingual schools. Public immersion programs must adhere to the same content standards as monolingual schools; therefore, the only clues available concerning language development come from English language arts standards, which reflects a lack of attention to the linguistic rights of bilingual children. Because bilingual schools follow learning objectives designed for monolingual schools, it may prove useful to contemplate which equivalent components of Spanish grammar would be necessary to meet these standards.

For instance, English Language Arts and Reading standard W1 (Common Core Standards Initiative, 2021, p. 19) states that Kindergarten students are expected to “Use a combination of drawing, dictating, and writing to compose opinion pieces.” Because the subjunctive occurs in predicates of desires, hypothetical information, and emotions, this
structure is necessary to articulate opinions and evaluations of events that may not hold in the real world. Moreover, Standard L1c (Common Core Standards Initiative, 2021, p. 28) states that fifth grade students are expected to “Use verb tense to convey various times, sequences, states, and conditions.” The subjunctive mood exemplifies one such use of verbal morphology that implies a shift in perspective (see §2.2.1 and §2.2.2), which relates to states and conditions. Therefore, there is evidence from language and writing standards prepared for conventional monolingual programs that the Spanish subjunctive is necessary to accomplish these objectives across the primary years.

2.5. Conclusion

In the present chapter, I have laid out the reasons for which the Spanish subjunctive has attracted interest in bilingualism research. This grammatical structure has been difficult to define, given that it is instantiated in a single set of morphological inflections that is distributed across a number of contexts that have unique syntactic, semantic, and pragmatic characteristics. Two accounts have been particularly fruitful for describing the Spanish subjunctive in acquisition literature. Firstly, it has proven useful to group uses of the subjunctive into deontic, epistemic, and epistemological modal bases (Chung & Timberlake, 1985). Secondly, Quer’s (1998, 2001, 2006, 2009) proposal concerning the syntax of mood has shown that the intensional subjunctive occurs in contexts of lexical selection, while the polarity subjunctive occurs in contexts in which indicative mood can also be used.

Research on the monolingual acquisition of the Spanish subjunctive has shown that these accounts are helpful in understanding the lengthy developmental timeline that children experience. Children master the subjunctive in the deontic modal base earlier
than the epistemic modal base, and develop command of epistemological modal base last, as late as age twelve. In the case of epistemic and epistemological modalities, children’s acquisition of mood alternations is contingent upon Theory of Mind and the recognition of false beliefs (Ahern & Torrens, 2021; Pérez-Leroux, 1998). Therefore, the Spanish subjunctive is a grammatical structure whose development extends well beyond the onset of schooling, well past the time when HS typically experience a decrease in HL exposure.

Research on bilingual childhood acquisition of the subjunctive has been limited, but it appears that children use quantitatively fewer instances of this mood than monolingual adults or age-matched Spanish-dominant peers. Furthermore, child HS’ development of the subjunctive is highly dependent on the input that they receive (Dracos & Requena, 2022; Flores et al., 2017). The extensive research on adult HS’ development of the Spanish subjunctive has revealed that there are a number of factors that appear to shape the acquisition of this structure. These studies have documented that morphosyntactic proficiency, frequency of HL use, and age of onset of acquisition of English are variables that influence differences between HS. Although some studies have explored the distinction between intensional (obligatory) and polarity (variable) subjunctive (e.g., Giancaspro, 2017; Montrul, 2007, 2009; Pascual y Cabo et al., 2012; van Osch et al., 2017), others have posited a central role for modal bases (Lustres, 2018; Perez-Cortes, 2016). Finally, speakers appear to exhibit the greatest variability in use of the subjunctive mood in production, especially with morphologically-regular and less-frequent subordinate verbs.

The contributions of this research to HL theory have been highly impactful. Although early research claimed that HS do not achieve complete development of the
subjunctive mood, more recent studies have highlighted how heritage grammars are in some ways more complex than those of monolingual speakers. Research on the subjunctive has been essential for understanding the myriad factors that are uniquely important to HL acquisition and that do not appear to affect adult monolinguals. Therefore, the intricacies of this structure have allowed for a research program that has broadened our knowledge of how HLs differ from monolingual varieties in highly systematic ways.

An additional factor that may be important in accounting for HS’ development of the subjunctive is bilingual education. Although Potowski’s (2007a, 2007b) data do provide important information about adolescent HS’ acquisition of multiple contexts of the subjunctive in immersion schools, it is necessary to compare monolingually- and bilingually-educated peers in order to fully highlight how different methods of schooling impact acquisition. Because of the research showing that L2L outperform proficiency-matched HS in the production and judgment of the subjunctive (Montrul & Perpiñán, 2011), and the fact that even L1 speakers can differ from one another in their interpretation of complex structures (Andringa & Dąbrowska, 2018; Dąbrowska, 2008, 2010, 2018; Dąbrowska & Street, 2006; Street & Dąbrowska, 2010), the subjunctive may represent a grammatical structure that is part of Hulstijn’s (2011) higher language cognition, requiring schooling for development.

Understanding the ways that educational experiences shape HL development and maintenance is a new opportunity in this field of research. In the following chapter, I introduce different approaches to bilingual education, as well as the previous research on immersion schooling. I discuss how immersion in two languages provides HS with robust
academic, cognitive, and linguistic benefits, but point out that language development within educational settings must be explored comparatively, by addressing the differences that HS enrolled in different types of schooling experience in the acquisition of Spanish. I also discuss how the present study contributes not only to research on the subjunctive and on heritage bilingualism, but also to applied linguistics and bilingual education.
CHAPTER 3: BILINGUAL AND IMMERSION EDUCATION

3.1. Introduction

22% of children in U.S. schools speak a language other than English (Kagan & Carreira, 2017). Spanish is the most widely-spoken of these languages, as there are over 57.5 million Americans of Latinx descent (United States Census Bureau, 2017), making the United States the world’s second-largest Hispanic nation (Noe-Bustamante, 2019). Given the prevalence of Spanish in the United States, bilingual education has the potential to provide Latinx students with resources for maintaining their linguistic heritage by prioritizing their bilingual development. There has been an increase in the popularity of dual-language immersion (DLI) programs in the United States that teach their curriculum in two languages. As of 2021, there were 3,649 dual-language immersion programs nationwide, of which 2,936 (80.4%) provide instruction in English and Spanish (American Councils for International Education, 2021).

Recent research on bilingual education has focused in particular on two-way immersion (TWI), a specific type of dual-language immersion that has a positive impact both for second language learners (L2L) and heritage speakers (HS) of the non-majority language used for instruction, known as the partner language. In TWI programs, there are native speakers of each of these two languages. This normalizes bilingualism for all students, not just for L2L of the socially-dominant language. As Genesee (2013) describes, immersion programs are designed to provide students with the same content knowledge and to support them in achieving the same levels of educational success as monolingual children, with the added benefit of achieving proficiency in two languages. These programs are well-positioned in increasingly multilingual societies because they
broaden students’ perspectives and expose them to the cultures and peoples of the languages of instruction. As I will describe in this chapter, these programs are also a promising forum through which linguists can study how schooling contributes to HL acquisition.

Although this method of bilingual education holds promise for all children, before continuing, it is imperative to recognize that this approach to bilingual education is controversial. Scholars have critically pointed out that the needs of English-speaking L2L of the partner language are often prioritized (Flores, 2016; Flores & García, 2017; Freire et al., 2021; Petrovic, 2005; Valdés, 1997; Valdez et al., 2016), which does not address the educational inequities that this approach to bilingual education was designed to combat. From a raciolinguistic perspective (Rosa & Flores, 2017), this approach to bilingual education does not adequately address the systemic inadequacies that face the Latinx populations for whom these immersion programs were designed. Following Flores and García (2017, p. 26), the recent gentrification of TWI means that “Latinx children are treated as a commodity to boost the resumes of White middle-class children.” As Flores and McAuliffe (2020) illustrate, the mere implementation of TWI does not guarantee their success and does little to boost minoritized students’ achievement. Rather, the authors argue that broader policy reform is necessary to accommodate these students and support their development (Flores & McAuliffe, 2020, p. 11):

It behooves those of us who are committed to promoting DLE [dual language education] to situate any efforts to expand these programs within a broader public policy conversation that includes policies directly related to DLE, such as developing pathways for bilingual teachers to enter the workforce as well as policies that do not seem immediately directly related to DLE but that nonetheless impact the success of these programs, such as initiatives to alleviate poverty and increase housing stability.
Therefore, before continuing, it is important to clarify that I concentrate on HL development in my dissertation, rather than on second language (L2) acquisition of Spanish by English-dominant children. There is relatively little knowledge of HL development in TWI, as most research has focused on L2L of the partner language or on Spanish HS’ development of English. Exploring the role of DLI in HL acquisitions has implications for social justice, as it provides HS with an opportunity to receive access to education in their HL that would otherwise not be available to them. However, most research has assumed that DLI programs lead to growth in the HL without testing this claim directly. Therefore, exploring how DLI shapes language development lays the groundwork for future work on research-based pedagogies, curriculum development, and language policies for immersion programs. Secondly, it provides useful insight into how continuous exposure to the HL shapes its development, which is a central question in language acquisition research. Since this topic is not yet well-explored, I cite relevant studies on L2L enrolled in immersion programs as a point of comparison, but the focus of this chapter is on how bilingual schooling contributes to the development of Spanish as a HL.

I begin this chapter with an overview of different methods of and issues in bilingual education, concentrating in particular on DLI programs. I first present different methods of bilingual education in U.S. schools. Next, I discuss research on cognitive development and academic achievement in DLI programs. Subsequently, I present a detailed review of the limited past research on HL development in transitional bilingual education compared with DLI programs. I conclude by addressing how research on DLI
presents unique opportunities for research on HL theory and pedagogical practices for teaching HS of Spanish.

3.2. Introduction to Bilingual Education

Lambert (1977) discusses that community perspectives and ideologies can result in either additive or subtractive bilingualism. Additive bilingualism is a philosophy that prioritizes bilingual skills, while subtractive bilingualism focuses on the “monolingualization” of diverse communities. Subtractive bilingualism frequently ensues in contexts of minority language development, such as that of Spanish in the United States. Schools traditionally do not provide English learners with support in their home language(s), but rather offer small-group English as a new language (ENL) instruction (e.g., Freeman, 2007). This approach concentrates exclusively on the acquisition of English, with little emphasis on students’ home language(s). In communities with large numbers of speakers of a single language, transitional bilingual programs are frequent. In these programs, children begin to receive instruction in the HL, but transition to monolingual classrooms as soon as possible. Although these programs offer bilingual instruction, they are still subtractive because they concentrate solely on development of the L2 through temporary L1 support, rather than on long-term maintenance.

Contrastively, DLI programs epitomize additive bilingualism because they offer instruction in two languages (Freeman, 2007). Acosta et al. (2019, p. 9) describe that “The shift in emphasis from monolingualism to bilingualism throughout the country makes it possible for ELLs [English language learners] to achieve higher levels of academic success through native language proficiency,” as I will discuss throughout this chapter. As mentioned, above 80% of U.S. DLI programs implement Spanish as the
partner language, although there are immersion programs taught in 27 foreign and indigenous languages nationwide (American Councils for International Education, 2021).

There are two forms of DLI schooling. The first is *one-way immersion* (herein, OWI), which is most common in communities with large populations who speak a single language at home. A particularly well-known example of OWI has been popular in Canada, in which English-dominant children learn French as their L2 (see Lindholm-Leary and Genesee, 2014 or Swain, 2000 for a review of Canadian OWI research and its contributions to L2 acquisition theory). Another type of OWI, which has been less frequent and consequently less studied, incorporates L1 speakers of the partner language who are L2L of the socially-dominant language, such as children whose home language is Spanish learning English in the United States. The second approach to dual-language immersion is TWI, which is popular in contexts in which there are speakers of two languages in a particular community. This approach has been shown to correlate with favorable cognitive, academic, and linguistic outcomes (see Lindholm-Leary, 2016 for an overview). Figure 4 summarizes the different types of bilingual programs.

![Figure 4](image_url)

**Figure 4.** Summary of methods of bilingual education in U.S. schools.
As mentioned, OWI and TWI programs share many characteristics; however, the key difference is that in TWI programs, there are reciprocal language learning opportunities: all monolingual children begin acquiring a second language through academic instruction, and those with home exposure to the two languages of instruction before schooling begins continue to solidify their bilingual skills. In such situations, simultaneous bilinguals can view their bilingualism as an asset and set the example for monolingual children. This contrasts with traditional schooling in which students strive to develop proficiency in the dominant language only. In this regard, TWI normalizes the language learning process, while OWI may still inadvertently cause its students to view their bilingualism as a cultural barrier compared to children in monolingual classrooms. Furthermore, children who have a different home language and begin learning English as their L2 and the partner language as a third language have also experienced great success in immersion programs (Lambert & Genesee, 1983), especially when these children develop literacy in their L1 (Swain & Lapkin, 1991). TWI is meant to provide an equitable opportunity for all children to learn two languages and academic content. However, given the findings that TWI has been gentrified, the advantages of this method of bilingual education only outweigh those of OWI when students of all backgrounds are given an equal voice in TWI programs (Flores & McAuliffe, 2020; Freire et al., 2021; Valdez et al., 2016).

It is important to recognize that the structure of bilingual programs likely affects the acquisition of the partner language. For this reason, Watzinger-Tharp et al. (2018, p. 4) describe that differences in the programmatic factors described above “Limit the ability to identify causal program effects or to generalize beyond a study’s particular
context.” An important factor in both types of DLI programs that can determine language learning outcomes is the amount of instruction in the partner language. Most immersion programs in the United States integrate half of content area knowledge in each language and either maintain the 50% to 50% balance throughout elementary education or gradually increase exposure to English in the late elementary years. These schools accordingly have 50/50 DLI programs. In contrast, a small handful of immersion programs implement a 90/10 model, through which all content is delivered in the partner language in the early elementary years except for English language arts. Towards the end of elementary school, instruction in the partner language decreases and reaches parity, with approximately 50% of instruction in each language. Some OWI programs in Canada even offer total immersion in French until between second and fourth grade (Genesee, 2013). Although the 50/50 and the 90/10 models are the most cited models in educational literature (e.g., Freeman, 2007; Howard et al., 2016; Lindholm-Leary & Howard, 2008), programs can incorporate any balance of English and partner language instruction, and specific content areas taught in each language and grade vary between programs.

The timing of immersion programs is also a deterministic factor in the attainment of bilingual skills. Most DLI programs in the United States and many OWI programs in Canada take place during the primary years. However, some bilingual programs maintain immersion throughout middle or secondary school. In other “delayed” immersion programs, children begin receiving instruction in the socially-dominant language and have weekly exposure to their L2 as a foreign language in the elementary years, before transitioning to partial or full immersion in middle school. Research has shown that L2L in delayed immersion programs in Canada make faster initial progress in the acquisition
of French due to their cognitive maturity (Genesee, 2013), but Lapkin et al. (1991) found that adolescent French L2L in delayed immersion obtained average scores on grammatical assessments between 50% and 75% those of age-matched early immersion peers. In contrast, the early immersion students in Swain et al. (1991) patterned with native French speakers in measures of comprehension, but not in written or spoken production.

3.3. Academic and Cognitive Benefits of Dual-Language Immersion Education

It is perhaps ironic that the bulk of existing research on DLI has focused not on acquisition of the partner language, but rather on the development of language and literacy skills of the socially-dominant language. This is because of the importance of high-stakes standardized assessments in the age of teacher accountability in U.S. schools that inadvertently shift the focus of DLI to English development (Gottlieb, 2021). Many studies in the bilingual education literature thus take advantage of vast amounts of standardized assessment data, which can easily integrate large-scale analyses of hundreds or thousands of participants. Moreover, multiple studies have employed non-linguistic measures to determine whether bilingual education provides students with cognitive benefits beyond developing skills in a second language. It appears that learning two languages in DLI programs provides children with unique cognitive skills that are not equally cultivated through monolingual schooling.

3.3.1. Cognitive Development

Psycholinguistic research has revealed that bilingualism confers positive cognitive and neural consequences (see Barac & Bialystok, 2012 or Kroll & Bialystok, 2013 for overviews). An interesting question is whether this bilingual advantage is subject to age
effects that limit the advantages observed across studies to early bilinguals. One study that offers insight into this topic is Nicolay and Poncelet (2015), who carried out a longitudinal study comparing preschoolers enrolled in TWI with monolingual French-speaking children matched by age, socioeconomic status, and nonverbal intelligence. After the three years, the immersion students averaged faster reaction times on auditory control and divided attention tasks than monolinguals. In a study using many of the same tasks, Barbu et al. (2019) found that immersion students’ growth on an auditory recognition task was evident after a single year of bilingual instruction. Finally, Garraffa et al. (2020) tested whether bilingualism provided a cognitive advantage with 23 monolinguals, 10 Gaelic HS, and 16 Gaelic L2L in an English-Gaelic TWI school. All of these students completed an auditory inhibition task similar to the one in the previous studies. Both HS and L2L of Gaelic in the immersion program, all between sixteen and eighteen years of age, achieved higher performance on an auditory distractor task than monolingual peers.

Although the latter was the only one of the three studies reviewed here that concentrated on HS, it is important to recognize that it is unclear whether HS’ advantage on non-linguistic measures was due to DLI or rather the effects of early onset of bilingualism. A study comparing HS in DLI programs to age-matched peers with similar home language exposure enrolled in a monolingual program would be necessary to tease apart the effect of immersion from early childhood bilingualism. Research on academic development and achievement in immersion programs has adopted such an approach by comparing standardized assessment scores of HS enrolled in DLI to those of monolingually-educated peers, as I describe in the following section.
3.3.2. Academic Development

The majority of research on DLI has utilized standardized assessment scores to evaluate students’ progress. Such an approach is advantageous because it allows for analysis of hundreds or even thousands of participants; however, the limitation from a linguistic perspective is that these data are not experimental in nature and cannot provide precise insights into the acquisition of formal aspects of grammar (e.g., phonology, morphology, syntax, etcetera). In a longitudinal study spanning sixteen academic years, Thomas and Collier (2002) reported that native Spanish speakers who were English L2L in 50/50 and 90/10 TWI programs achieved or exceeded the standardized test scores of Latinx peers in monolingual programs in all academic content areas. Furthermore, Lindholm-Leary (2001) reported findings of a longitudinal analysis of 700,000 assessment scores from over 9,000 students. She found that by seventh grade, Spanish HS in TWI had achieved mathematics and reading assessment scores in English that exceeded those of monolingually-educated HS peers, and their performance paralleled that of monolingual English children. These analyses on the effectiveness of TWI show that learning academic content in two languages not only enables achievement at the level of monolingually-educated bilingual peers, but can exceed it.

Most recently, Serafini et al. (2019) conducted a longitudinal analysis of 18,588 English language learners in Miami Dade County, evaluating students’ standardized assessment data from kindergarten to fifth grade. In their analyses, the researchers reported that students enrolled in TWI programs were more likely to be reclassified as English proficient in earlier grades, and relatedly that earlier reclassification led to average higher standardized test scores in mathematics and grade point averages.
Therefore, students in TWI appear to become more proficient in subjects taught in English than peers in transitional bilingual and monolingual programs, despite less exposure to the socially-dominant language than monolingual peers.  

In perhaps the most compelling study in favor of TWI education for HS of Spanish using assessment score data, Marian et al. (2013) compared cross-sectional average standardized English language and mathematics scores of third, fourth, and fifth grade students in four groups: 134 Spanish HS and 75 Spanish L2L in 90/10 TWI programs, 23 Spanish HS who had been in a transitional bilingual program, and 1,777 children who were monolingual speakers of English. Results are summarized in Figure 5 below. Average assessment scores by group and age show that Spanish HS in both programs had similar reading comprehension scores in third grade, far below English those of speakers. However, by fifth grade, HS in TWI exceeded all groups in English reading comprehension, including monolinguals, while Spanish HS from the transitional program placed only modestly higher than their third-grade peers.

---

24 It must be recognized that classification as English language proficient and membership in a DLI program are not mutually exclusive because these programs are designed to foster development of both languages.

25 Data were reported as group averages, which means that the disproportionate group sizes are not problematic for between-group analyses, although there could be considerable within-group variability that was reported.
Figure 5. Average standardized test scores in English language achievement as reported in Marian et al. (2013, p. 175 and p. 177).\textsuperscript{26}

Marian et al. also analyzed students’ mathematics scores, as shown in Figure 6. In this case, both groups of HS obtained lower average scores across grades than home speakers of English, but the TWI students enjoyed more substantial growth. Specifically, both groups of Latinx students had similar performance in third grade, but there was a 45-point gain in average mathematics test scores for children in TWI from third to fifth grade, compared to a 25-point gain for HS in the monolingual program. The average difference between TWI students and monolingual English-speaking peers in fifth grade was 36 points, almost half of the 63 points between the two groups of monolingually-educated children. However, in an analysis of 3,457 students in immersion programs and 24,841 children in monolingual classes, Steele et al. (2017) did not find differences in mathematics and science standardized test scores between immersion and non-immersion students, despite an advantage for immersion students in immersion on reading

\textsuperscript{26} “MLE” signifies “monolingual education.”
assessments. Therefore, there is mixed evidence as to whether TWI offers Latinx children an advantage in obtaining mathematics skills, but there is no disadvantage of bilingual education in these content areas. However, these children still do not converge on the average levels reported for monolingual children, which reinforces the fact that TWI by no means eliminates the inequities for these learners, even if it does minimize them when compared to more conventional methods of education.

**Figure 6.** Average standardized test scores in mathematics as reported in Marian et al. (2013, p. 175 and 177).

Finally, Acosta et al. (2019) compared English language and literacy scores of Spanish-speaking students in one 50/50 and one 90/10 TWI elementary school in Los Angeles. The data evaluated incorporated students across all grades during three years. In the 50/50 program, an average of 76.2% of ELLs per year did not reach the grade level standard for language arts while 7% met or exceeded state standards. In contrast, in the 90/10 TWI program, an average of 53.3% of ELLs per year did not meet state standards, and 12.5% of these students met or exceeded the state standards. Intriguingly, an average
of 15.5% of students in the 90/10 TWI program had been reclassified each year as English proficient, compared with 9.6% of students in the 50/50 TWI program, despite having received less cumulative exposure to English. It is unclear how students were classified as fully proficient; regardless, there are advantages in favor of the 90/10 TWI program concerning faster development of English and higher average test scores despite lower quantities of exposure to their L2. This greatly reinforces the need for HL support to provide multilingual children with superior opportunities for equal educational success.

Although greater exposure to Spanish appears to have a positive impact on academic achievement, it is important to recognize that more than half of Latinx students in the 90/10 program performed below state thresholds for academic achievement. Although TWI appears to lead to favorable academic outcomes in comparison to monolingual programs, especially when higher concentrations of Spanish are used, there are still clear differences on most measures when compared to English-speaking peers. This reminds us that while immersion holds promise in bolstering HS’ success, as Flores and García (2017) describe, it is not a panacea for the deep educational inequities that Latinx youth face in the U.S. education system. However, it is evident that increased exposure to Spanish has a more positive impact on the attainment of bilingual skills and academic proficiency in multiple subject areas than other avenues of schooling for bilingual children. What cannot be gleaned from these studies is exactly how immersion schooling shapes HL development alongside English. In the following section, I discuss the limited information on students’ development of Spanish in bilingual schools.
3.3.3. Spanish Language Proficiency

The lack of emphasis on assessing HS’ partner language in DLI underscores the assumption that these bilinguals acquire high levels of competence in their HL; therefore, proficiency is seldom tested. However, given the well-documented differences between HS and speakers dominant in Spanish described in Chapter 1, it is quite possible that such an assumption may not be borne out, even in DLI programs. In this section, I review the small number of educational studies concentrating on HS’ acquisition of Spanish, as well as some relevant research in second language acquisition on long-term language development in TWI schools.

One study that specifically targets HL proficiency development in immersion schools is Lindholm-Leary and Hernández’s (2011) analysis of the Aprenda standardized Spanish language exam scores of 732 Spanish HS between fourth and eighth grades in a 90/10 TWI program in California. The researchers carried out a cross-sectional comparison of two grade level bands (fourth and fifth grades and sixth through eighth grades). Results indicated that proficiency in English correlated with Aprenda scores across grade levels. Therefore, it appears that proficiency in the HL correlates with HS’ English development in TWI.

Tentative additional evidence that TWI positively impacts the acquisition of Spanish as a HL comes from Lindholm-Leary (2001), who found that HS enrolled in a 90/10 immersion program averaged higher scores on standardized tests in Spanish by the end of elementary education than peers in a 50/50 program. No difference in English language test scores was found between students in either program by the end of elementary school. Christian et al. (2004) reached similar conclusions regarding bilingual
development in 50/50 and 90/10 Spanish-English TWI programs using independent grammar tests. Therefore, it does not appear that increased exposure to Spanish impacts the acquisition of English long-term, but does provide opportunities for HS to develop high levels of bilingualism. What is unknown is how these HS compare to children who are monolingual speakers of or dominant in the same language.

If more exposure to Spanish leads to stronger command of the HL, another important question is whether proficiency can be maintained after the elementary years during a TWI program. Since HS typically experience a shift in dominance around the onset of schooling in English, it is plausible that TWI students also experience a similar shift after their immersion programs. Fortune and Tedick (2015) explore this topic by analyzing cross-sectional data from 218 Spanish L2L in kindergarten and second, fifth, and eighth grades in four 90/10 immersion programs. The researchers reported average performance on oral fluency, grammar, vocabulary, and listening comprehension as measured by tests from the Center for Applied Linguistics. The results of each groups’ average scores across these categories are represented in Figure 7.
As is observable, the L2L children exhibited tremendous growth in oral proficiency in Spanish during the early elementary years, during which time academic instruction was predominantly in the partner language. Growth slowed but continued through the late elementary years and reached ceiling in fifth grade, at which point academic instruction became balanced in both languages. There was a slight decrease across all four skills between fifth and eighth grade, concurrent with increased exposure to English, but students’ averages across all domains were still higher than in second grade. Therefore, these results signal that continued exposure to a second language is vital for L2Ls’ development, but these bilinguals had still retained L2 knowledge throughout middle school. Because HS in DLI programs have home and school exposure to Spanish and in this regard have a considerable advantage over L2L, it is plausible that these students would also develop high levels of proficiency over the course of a DLI program and would show similar trends after the immersion years.

**Figure 7.** Cross-sectional oral proficiency results reported in Fortune and Tedick (2015, p. 648).
Nevertheless, it is unclear which specific linguistic structures developed during the elementary years lead to the advances in proficiency observable in standardized test data, or which structures weakened to cause the backslide between fifth and eighth grade in Fortune and Tedick’s study. This highlights the need for standardized tests of the partner language for immersion students (Thane et al., 2022) and for investigations concerning the acquisition of specific linguistic properties across age groups. In addition to investigating how exposure to the home language at school can benefit Spanish HS’ academic progress, it is also important to consider non-linguistic factors such as socioeconomic status in these programs.

3.3.4. Sociocultural Factors

According to the National Center for Educational Statistics (2019), in 2016, 9.1% of Latinx youth did not complete high school education, compared to a national total of 5.8%. Similarly, only 39% of Latinx high school graduates enroll in university education, compared to the national average of 41%. Therefore, Latinx youth are at considerably higher risk of not finishing high school, and those who do complete secondary education are less likely to go to college. It is also important to consider that as HS are members of a broader community of speakers of the HL, a vital consideration in DLI research is how sociocultural factors may impact bilingual language acquisition. As Lindholm-Leary (2016, p. 210) describes, “Studies have demonstrated that Spanish-speakers tend to have very low SES in general, and that SES has a powerful impact in explaining the lower achievement and language proficiency of Spanish-speaking children.”

Although finding a sample of HS students that allows for the separation of SES from participation in bilingual schooling is challenging (Genesee et al., 2006), there are
some clues that DLI is more beneficial for diverse children than traditional education. For instance, Thomas and Collier (2002) found that TWI graduates had higher grade point averages and lower high school dropout rates compared to peers in English-only schools and in OWI programs. Relatedly, Christian et al. (2004, p. 8) reported that in interviews with a group of 93 high school students who had attended TWI programs, “Half of the Hispanic former ELL [English language learner] students said that participating in the two-way program kept them from dropping out of school.” Therefore, it appears that DLI education (in this instance, specifically, TWI programs) also influences educational performance and attainment in communities with lower average SES and in which children are at higher risk of not completing secondary education. More studies on the relationship between DLI and long-term academic performance are urgently needed.

However, other studies remind us that DLI does not negate the effect of SES, but rather provides an advantage over students with similar demographic characteristics enrolled in monolingual education programs. To explore the role of TWI and monolingual education on children with lower SES, Lindholm-Leary and Block (2010) conducted a study of standardized test scores of 659 low-income Latinx students in fourth, fifth, and sixth grades enrolled in four 90/10 TWI programs in California. Students in these schools exhibited English language arts test scores that approached the state average and greatly outscored monolingually-educated Latinx peers in the same districts. Promisingly, average mathematics standardized test scores were above the state average, suggesting that TWI in low-income areas has important implications for Spanish HS in their educational performance, especially in this content area. The authors also evaluated students’ performance on the Aprenda Spanish language measure and found
that HS in TWI programs outperformed monolingually-educated peers in their Spanish proficiency. Based upon these results, it appears that TWI positively influences partner language and academic development in low-income populations. However, as discussed throughout this chapter, DLI does not eliminate the differences in academic achievement that disproportionately affect certain races and ethnicities, even if it does mitigate them to a certain extent. In addition to addressing the positive impact of DLI on children of lower SES, immersion appears to benefit children with diverse intellectual profiles and learning needs.

3.3.5. Special Education and Non-Traditional Learners

A prevalent misconception surrounding bilingual education is that it is not well suited for children with diverse learning needs. This applies both to HS students who speak the partner language of a given DLI program at home as well as learners of the partner language who are dominant in English (or any other socially-dominant language). Genesee and Fortune (2014) provide a thorough overview of these topics and clarify that DLI does not reverse children’s needs for special education or nonconventional classroom support; however, it appears at least as effective as monolingual education in addressing these students’ needs. To summarize, Genesee (2013, p. 38) describes that “At-risk students in immersion programs generally perform less well than students in the same program who are not at risk, but their progress is not differentially impeded in comparison to comparable at-risk students in native language programs.”

Further evidence for this claim comes from Genesee (1976), who found that there was no difference in proficiency in English for students with an intelligence quotient of between 85 and 115 in OWI programs in Canada compared to those in conventional
monolingual programs. These children performed below the level of students with higher intelligence quotients in both programs; hence, as in the case of SES, immersion does not eliminate the impact of intelligence, yet still has the added advantage of providing children with opportunities for acquiring a degree of fluency in two languages that is not available through monolingual schooling.

Regarding special education, Myers (2009) evaluated the academic performance of third-, fourth-, and fifth-grade students receiving special education in 50/50 TWI and monolingual schools. Students completed assessments of English language ability and content area literacy; there were no differences found between groups. Therefore, it appears that immersion is at least as effective as traditional education in meeting the needs of children with diverse learning profiles, but more research on partner language development in this area is necessary.

3.3.6. Summary of Findings

The studies to date on DLI education for Spanish HS have made a favorable argument for academic and linguistic development, although only some studies have compared children enrolled in multiple types of schools. Multiple studies have revealed that bilingual children and adolescents in DLI programs develop unique cognitive skills as a product of receiving a bilingual education, particularly in auditory inhibition, even before developing high levels of L2 proficiency (Barbu et al., 2019; Garaffa et al., 2020; Nicolay & Poncelet, 2015). Furthermore, most previous studies (with the exception of Steele et al., 2017) have found that HS students in DLI programs obtain higher average standardized assessment scores in multiple content areas when compared to peers in transitional bilingual programs (Lindholm-Leary, 2001; Marian et al., 2013). These
advantages are particularly evident when students receive more exposure to Spanish, which is correlated with higher HL proficiency at no long-term expense to English development (Howard et al., 2004; Lindholm-Leary, 2001). Finally, graduates of DLI appear more likely to complete secondary and tertiary education and to have higher grade point averages, pointing to superior academic performance.

Although SES has been identified as a key factor in educational achievement, it appears that students of diverse backgrounds can still enjoy success in developing two languages through DLI and are at an advantage over monolingually-educated peers in academic achievement, even though students in immersion remain more likely to perform below state averages. Furthermore, DLI education is at least as effective in supporting children with special needs or who have lower intelligence quotients. These findings are resoundingly positive and suggest that immersion can provide an impactful academic experience for all children.

However, despite the amassing research on the positive effect of DLI education, there is a relative paucity of knowledge of how sustained exposure to two languages through bilingual schooling impacts HS’ acquisition and maintenance of specific linguistic structures in Spanish. For example, the proficiency data in Lindholm-Leary and Hernández (2011) or Fortune and Tedick (2015) provide important yet general approximations about language development, as it is not possible to understand which areas of grammar were particularly challenging to acquire simply by reviewing test scores. In the following sections, I review the limited previous research using experimental methodologies in linguistics on the impact of monolingual, transitional bilingual, and DLI education on the acquisition of Spanish as a HL.
3.4. Language Development in Transitional Bilingual Education

Research in the field of speech and language pathology has shown that during the preschool and early elementary period, bilingual children frequently exhibit an increase in length of utterances in English, while growth in length of Spanish utterances stagnates (Castilla-Earls et al., 2019; Hiebert & Rojas, 2021). In a recent longitudinal analysis, Hiebert and Rojas (2021) collected six speech samples in Spanish from 34 simultaneous English-Spanish bilingual children between three and five years of age enrolled in a DLI program. The researchers reported that the average length of utterance in Spanish increased across sessions, but the rate of growth decreased over time. Although participants’ lexical and morphological diversity decreased, their percentage of grammatical utterances without grammatical errors remained constant. Therefore, the researchers concluded that although participants produce longer narratives with age, the increasing exposure to English appeared to slow the rate of development of grammatical structures and of lexical diversity in Spanish, detectable around the beginning of the primary school period.

Castilla-Earls et al. (2019) expanded upon these results by addressing the role of early bilingual education on HL acquisition using longitudinal corpus data with 1,080 simultaneous English-Spanish bilinguals. Two thirds of these participants were enrolled in bilingual education programs;²⁷ the balance received a monolingual English education.

²⁷ Note that Castilla-Earls et al. (2021) describe that the bilingual education group was comprised of students who participated in transitional and immersion programs. Importantly, much of the instruction that students received during the early primary years was in Spanish, such that a comparison of transitional and immersion programs was not feasible.
The students in immersion showed a slower decrease in percentage of grammatical utterances in Spanish but lagged slightly behind age-matched peers in monolingual schools in English grammaticality. Such findings show that shifts from the home to the socially-dominant language are typical in bilingual children concurrent with the onset of schooling, but that bilingual education may be a retardant of this shift, even if it does not abate it altogether. Once again, however, these data do not provide information about which linguistic structures are particularly vulnerable during the period in which children experience shifts in language dominance, but rather offer a broader overview of bilingual development at the onset of DLI programs.

The effect of decreasing accuracy in the use of Spanish as a result of transitional bilingual programs also affects Spanish as a HL across the primary years. As briefly surveyed in Chapter 2, Merino (1983) conducted a study with 41 English-Spanish simultaneous bilingual children between kindergarten and fourth grade, all of whom had been or actively were enrolled in a transitional bilingual program. Merino utilized the Bilingual Language Acquisition Scale (Merino, 1976), which assessed children’s morphosyntactic knowledge through production and comprehension measures in English and Spanish.

In the cross-sectional component of her study, Merino compared the children in different grades to one another. In production, kindergarteners achieved an average of 56% accuracy in Spanish and 52% in English, compared to fourth graders’ Spanish accuracy of 65% and English accuracy of 86%. Students’ performance in Spanish peaked in first grade, which suggests that the acquisition of the HL continued in the early

28 The researchers did not define how grammatical was defined in this manuscript.
primary years during the bilingual program, but not thereafter. In comprehension, participants were more consistent across grade levels, showing average scores of 88% by the end of grade four. Figures 8 and 9 illustrate participants’ cross-sectional development of morphosyntactic knowledge in both languages on the production and comprehension measures respectively. Such findings align with research showing that decreased use of the HL can lead to asymmetrical production and comprehension patterns (e.g., Perez-Cortes et al., 2019).

![Cross-sectional accuracy on production measure, Merino (1983)](image)

**Figure 8.** Cross-sectional accuracy scores in production of English and Spanish reported in Merino (1983, p. 283).
Merino conducted a follow-up with a subset of 32 participants two years later. She found that 72% of students obtained higher accuracy scores on the English language measure than during the first testing session two years prior, while only 13% of students exhibited a decrease in accuracy on an English production task. In contrast, 50% of students had lower accuracy scores on the Spanish morphosyntactic measure, 25% did not experience substantial change, and only 25% showed growth. Merino concentrated on three particular structures in her longitudinal analyses: past tense-aspect morphology in Spanish decreased from 87% accuracy to 74%, the appropriate use of relative clauses decreased from 100% to 44%, and use of the subjunctive mood decreased from 70% to 55%. It must be noted that the results do not provide a breakdown of children’s age
groups in the follow-up session; however, it shows that complex areas of grammar of the less-dominant language appear to encounter changes over time due to predominantly English schooling. These findings differ from the results of research on DLI programs, in which age appears to be positively correlated with bilingual development.

3.5. Language Development in Dual Language Immersion

Before continuing, it is important to return to the findings of the research carried out by Kupisch and colleagues (Barton, 2015; Bianchi, 2013; Kupisch, 2012, 2014; Kupisch et al., 2013, 2014; Lein et al., 2016), as cited in Kupisch and Rothman (2018) and presented in Chapter 1. These studies showed that French HS in Germany who received their secondary education in their HL patterned with German HS living in France, while Italian HS in Germany who had minimal education in the HL did not show the same pattern. Critically, these studies differ from the context of bilingual education in the United States in three ways. Firstly, the majority of instruction that the French HS who participated in these studies received was through their HL, whereby DLI emphasizes instruction in two languages (in the United States, English and the partner language, most typically Spanish). Secondly, the bilinguals in Kupisch and colleagues’ studies were secondary students; as described in §3.2, the majority of bilingual programs in the United States, including the one analyzed in this dissertation, span the primary years only. Finally, to the best of my knowledge, the lyceé French immersion schools are run privately, which implies that students in these programs may have had access to

29 It is possible that the majority of growth in Spanish language took place with younger students, such that these results were a product of early exposure to the HL through the transitional bilingual program.
additional educational resources that may not be available for all students in the context of public DLI programs.

The existing linguistic research on the acquisition of Spanish as a HL in DLI programs has continuously compared Spanish HS to L2L and age-matched Spanish-dominant children who are recent arrivals to the United States. Research findings are consistent in that HS perform substantially superior to L2L in TWI programs across tasks; however, HS in DLI pattern with Spanish-dominant students in tasks that measure some morphological and syntactic structures, but not others. Only indirect comparisons can be made between adults and children because to date, these populations have almost always been assessed in separate studies.30 While the studies comparing HS to L2L are useful in exploring the differences between these two groups of bilinguals, this approach does not fully address the role of DLI; doing so requires evaluating groups of monolingually-educated peers. In the following sections, I will provide an overview of past research on the acquisition of Spanish as a HL in DLI programs. Appendix B contains a summary of these studies’ findings.

3.5.1. Phonology

Of the extremely limited experimental research on the impact of DLI on the acquisition of Spanish, phonology is the least explored area of grammar in this line of study. Only Rodríguez (2021) has shown that HS in DLI perform similarly to Spanish-dominant populations, concentrating on the production and perception of lexical stress.

---

30 In studies that have compared HS adults and children, there is often not a systematic treatment of different age groups. This raises the question of whether findings in such studies are attributable to a particular age band of children, or if they are representative of children of a broad spectrum of ages.
this experiment, 33 HS in a DLI program and six Spanish-dominant bilinguals who were their caregivers completed an elicited production task as well as a delayed repetition task that targeted paroxytone and oxytone stress patterns. In production, Rodríguez found that the acoustic properties of HS’ stressed and unstressed vowels converged on those of their Spanish-dominant bilingual caregivers. However, in the delayed repetition task, which required that participants recognize the distinction between paroxytone and oxytone stress patterns in order to repeat them, Rodríguez found that HS had not reliably attended to the perceptual cues necessary to reproduce the same sentence. Therefore, she provided participants with explicit instruction on the perception of lexical stress. These participants then repeated the tasks; Rodríguez found that HS improved in the interpretation and subsequent repetition of lexical stress after the instructional intervention.

These findings suggest that the acoustic values of HS who were DLI students were similar to Spanish-dominant adults in their production of lexical stress. In contrast, their perception of the difference between paroxytone and oxytone stress patterns had not reached ceiling prior to her instructional intervention, which suggests that the continued naturalistic input in Spanish during the DLI program did not lead to an advantage in perception. Future studies may wish to incorporate a group of age-matched monolingually-educated HS children to determine whether DLI students have an advantage over their peers who do not receive immersion in Spanish, even if they differ from adults.

In a series of studies, Mehnke (2015, 2017, 2021) compared English-dominant Spanish L2Ls’ acquisition of Spanish in DLI programs. Menke used the same task, in which participants needed to respond to questions about animals by observing a series of
thirty pictures. There were 35 L2L in a 90/10 OWI program and 23 L2L in a 90/10 TWI program. 31 31 HS in the TWI program served as a point of comparison for the L2L groups. Students in each of these groups were in first, third, fifth, and seventh grades, allowing for an analysis of phonological development across the immersion years.

In the first study, Menke (2015) found that OWI students did not converge on the acoustic properties of the vowels produced by the HS in TWI. In contrast, Menke (2017) compared the L2L in the TWI program to their HS peers. In her results, there was no effect found for speaker group, but there was an interaction between vowel, stress, and group across first and second formant values. Finally, Menke (2021) compared the L2L in the OWI and TWI programs to the HS in their production of vowels, rhotics, and voice onset time. Menke reported that the L2L in TWI converged on the acoustic properties of HS’ taps and had similar voice onset time with voiceless stops, but both groups of L2L differed in their production of vowels. Interestingly, the acoustic differences in vowel production between L2L in OWI and those in TWI increased across grades, while the gap between L2L and HS decreased. Menke’s findings have useful implications for L2 acquisition, yet these results still do not provide information on HL development as a result of immersion. While HS typically show strong command of phonology (Au et al., 2002), future research will need to incorporate a group of monolingually-educated Spanish HS children to test the impact of DLI on HL pronunciation and perception.

31 96% of the L2L in the TWI program identified as Latinx, which could imply that a certain degree of home exposure to Spanish was present for these bilinguals, while 32 of 35 students in the OWI program did not identify as Latinx. Therefore, it is a possibility that the participants in one school had a disproportionately high degree of early exposure to Spanish from their extended family, which could have affected the outcomes reported in the study.
3.5.2. Morphology

As discussed in Chapter 1, previous research on Spanish as a HL has found that inflectional morphology is an area of grammatical competence that poses substantial challenges to HS because of its syntactic and semantic nuances (Jensen et al., 2020; Montrul, 2018; Polinsky & Scontras, 2020; Slabakova, 2008, 2013, 2019a, 2019b). Most studies compare HS in TWI programs to similarly-aged L2L and Spanish-dominant children, so the research reviewed below must be understood as initial investigations on this topic. Previous studies on HS’ morphological development in TWI relate to mood, conditional, person/number verbal agreement, and gender inflections, which I will review in the following sections.

3.5.2.1. Morphological Regularity. Fernández-Dobao and Herschensohn (2020, 2021) evaluated 21 HS in the fourth grade enrolled in a 50/50 TWI program and fifteen Spanish-dominant children. The researchers studied participants’ mastery of morphologically-regular and irregular verbs using controlled and meaning-focused written production tasks. Fernández-Dobao and Herschensohn reported that the greatest difference between Spanish-dominant participants and Spanish HS in the TWI program was in the production of the morphophonological stem change with a subset of Spanish verbs. In these verbs, the first vowel of the verb stem diphthongizes with some person/number conjugations of the simple present tense (e.g., infinitive jugar becomes juego-1PS, juegos-2PS, juega-3PS and juegan-3PP, with the /u/ of the root diphthongizing to /uэ/ in these four present tense conjugations). HS often regularized these verbs, producing forms such as jugo in place of juego (I play).
In contrast, the HS were highly accurate in producing “truly” irregular verbs (that is, with verbs whose irregularities do not involve a change in the stem but rather contain a non-canonical inflection). These researchers reported accurate use of aspect, mood, and subject/verb agreement morphology in production and on a comprehension test, such that the locus of variability was in the use of stem-changing verbs. HS’ sensitivity to morphological (ir)regularity is consistent with recent studies reviewed in Chapter 2 demonstrating that HS are more likely to produce subjunctive mood with subordinate verbs that have non-canonical formations of the present subjunctive (Giancaspro et al., 2022; López-Beltrán Forcada, 2021; Perez-Cortes, 2022).

3.5.2.2. Tense/Aspect Morphology. Spanish has two inflectional paradigms for the past tense that mark perfective and imperfective aspect morphologically. The preterit encodes perfective aspect, while the imperfect encodes imperfective aspect. The acquisition of grammatical aspect in Spanish – and across languages – has received extensive attention in bilingualism research. Although there have been multiple perspectives concerning how bilinguals develop tense-aspect morphology, there is consensus that adult L2L and HS of Spanish associate the preterit with some predicates and the imperfect with others. In particular, following the Aspect Hypothesis (Andersen, 1991; Shirai & Andersen, 1995), states are associated with the imperfect (e.g., Cuza & Miller, 2015; Cuza et al., 2013; Miller & Cuza, 2013; Montrul, 2002, 2009; Montrul & Perpiñán, 2011; Thane, 2023b; but see Granja-Falconi, 2010 for a counterexample). Although monolinguals also adhere to this tendency (Wulff et al., 2009), previous research has suggested that HS are less likely to “override” (see de Swart, 1998) the lexical semantics of the predicate in selecting appropriate aspect morphology, particularly
in the use of states in the preterit (e.g., Corbet & Domínguez, 2020; Montrul, 2002, 2009; Silva-Corvalán, 1994).

Potowski (2005, 2007a) reported data on aspect morphology using an oral narrative and an open-ended written production task. 52 eighth grade students in an 80/20 TWI program participated in this experiment, which also targeted other areas of morphology and syntax: 30 Spanish HS, 17 Spanish L2L, and 5 participants who had arrived in the United States and enrolled in the program within two years of the study. These “late arrival” students formed a comparison group of Spanish-dominant speakers. Potowski found that HS frequently used the imperfect with stative verbs and with actions that offer background information and the preterit with all other verbs and with actions that advanced the narrative (foreground events). In the written task, some instances of activity and accomplishment verbs were produced in the preterit, but seldom the imperfect. However, Potowski reported that the HS participants were able to use the preterit with a subset of state verbs, but exhibited an aspect system that was largely constrained by the nature of the predicate (stative or eventive) in their use of Spanish aspect morphology, despite sustained HL exposure at school. She thus claimed that HS may benefit from some degree of form-focused instruction to maximize development of their tense-aspect systems. It is, of course, difficult to compare HS in DLI programs to monolingually-educated adults or children without data from a single experiment. Furthermore, the lack of a receptive task makes it impossible to address these speakers’ underlying knowledge of the Spanish preterit-imperfect aspectual contrast.

3.5.2.3. Subjunctive Mood and Conditionals. As mentioned in Chapter 2, Spanish contains verbal inflections for indicative, subjunctive, and imperative moods.
There are present and imperfective past inflectional paradigms for the subjunctive. In addition, there is a morphological realization of conditionals in Spanish. Potowski (2007a, 2007b) reported findings concerning HS’ production of subjunctive mood and conditional morphology on a written cloze task. Spanish HS obtained an average of 4.39/6 in the use of the present subjunctive, 3.16/6 on the imperfect subjunctive, and 5/6 on the use of the conditional. In contrast, the recent arrival group produced the present subjunctive and conditional categorically, but only used the imperfect subjunctive at chance level (3/6). Potowski mentioned that there may have been dialectical variation that contributed to the variability in using the imperfect subjunctive. As in the case of the aspect data, the absence of a receptive task makes it difficult to claim that HS were not as familiar with mood and conditional morphology as the late arrival students. Research on subjunctive mood was presented in Chapter 2; to my knowledge, there is yet to be an experimental study on conditional morphology at the underlying level as with adult HS to which we can compare these data.

3.5.2.4. Subject/Verb Agreement. Spanish is a language with strong verbal agreement features. All verbs are inflected for person and number to agree with the subject (Corbett, 2006). Bilingual children acquiring English and Spanish frequently make errors in their production of Spanish person/number verbal agreement (Anderson, 2001; Austin, et al., 2021; Silva-Corvalán, 2014), although research on adult HS has presented conflicting results. On one hand, Giancaspro & Higdon (2022) found that HS make few agreement errors in the preterit, but less-frequent verbal paradigms such as the present perfect bring about more frequent person/number agreement innovations. On the
other, Foote (2011) reported that HS showed stable, monolingual-like knowledge of person/number agreement on a processing measure.

To evaluate development in young children, Goldin (2021) studied the acquisition of subject-verb agreement in 42 young Spanish HS between three and seven years of age enrolled in a PreK and early elementary TWI program. These children carried out an oral sentence completion task, a picture matching activity, and a forced choice task. The HS in this study developed the weak subject/verb agreement features of English at the same rate as 40 monolingual children who acted as a comparison group, which appeared to be a case of syntactic bootstrapping (see Bernardini & Schlyter, 1996 and Gawlitzek-Maiwald & Tracy, 1996). However, Goldin reported that production of subject-verb agreement in Spanish HS children was contingent upon the overall quantity of HL output, which reinforces the need to produce in both languages during early bilingual morphosyntactic development. Goldin also reported that bilingual children were able to differentiate between imperative commands and indicative morphology in receptive tasks before they were able to make selections between third person singular and plural forms, suggesting that syntactic representation for agreement develops before speakers reliably map it onto the corresponding morphological realizations.

3.5.2.5. Gender Agreement. Of all areas of the Spanish inflectional system, research on gender agreement has made the greatest inroads into our knowledge of language development in TWI programs. All Spanish nouns are classified as either masculine or feminine, and determiners and adjectives must be inflected to agree with the gender and number of their antecedents (e.g., Corbett, 1991; Gómez Torrego, 1999). Montrul and Potowski (2007) investigated the acquisition of gender agreement
morphology in 60 Spanish HS and L2L, also in an 80/20 TWI program. Twenty students were in first grade, twenty in third grade, and twenty in fifth grade; 22 were Spanish L2L, 22 were sequential Spanish HS who began learning English after age four, and 16 were simultaneous HS who had begun acquiring both languages before age four. Participants carried out an oral retell task and a ten-item controlled oral description task containing five masculine and five feminine nouns that elicited color adjectives inflected for gender and number. In the oral retell, both simultaneous and sequential HS averaged above 90% accuracy in use of gender. In the oral description task, there was an interaction between gender and age of acquisition, in which sequential HS were more accurate in using feminine gender than the simultaneous group, but both HS groups were near ceiling with masculine gender. Older children were more accurate with the gender of determiners in the spontaneous retell task, but this advantage did not emerge in the controlled description task.

Therefore, the researchers concluded that the increase in precision with gender agreement observed across age groups suggests that the TWI environment allowed HS to continue to acquire this structure, which is frequently variable in adult HS populations (e.g., Alarcón, 2011; Cuza & Pérez-Tattam, 2016; Hur et al., 2020; Montrul et al., 2008, 2013; Scontras et al., 2018). However, it should be noted that sequential bilinguals who had exclusive exposure to Spanish in the preschool years and a later age of onset of acquisition of English were overall more consistent in their use of gender morphology than those participants with two native languages. Such a finding suggests that early

32 Although the researchers discuss participants’ age at the time of study and their age of acquisition of onset of bilingualism, it is unclear how many L2L and simultaneous and sequential HS were in each of the grade levels.
exposure to two languages at home impacts acquisition even when HS receive immersive bilingual education. Once again, however, a receptive task is necessary to distinguish HS’ production tendencies from underlying knowledge of gender agreement.

Similarly, Gathercole (2002b; see Gathercole, 2002a for a summary of participants and schools involved in the research project) evaluated the impact of frequency of use of Spanish at home and type of education on the acquisition of non-canonical gender with 311 Spanish HS and L2L in second and fifth grades. Some of these participants were enrolled in a TWI program, and others received monolingual schooling. Moreover, some participants in each group primarily spoke Spanish at home, while others had balanced use of both languages with their families. These participants completed a grammaticality judgment task concerning non-canonical gender morphology (e.g., nouns that end in the traditional feminine inflection a but are masculine). Fifth grade students in TWI were more accurate than second graders in the same program, but the opposite was true of HS in the monolingual program: fifth graders were less precise in rejecting mismatched determiner-noun pairings than second grade peers, likely due to lack of exposure to the HL. These findings remained constant across low- and middle-SES groups.

These two studies on gender agreement have made three novel contributions to research on DLI. Firstly, both compared students in different grades within the immersion program, which addresses how HS progress with age. Secondly, Gathercole’s study is the only one to my knowledge to compare HS in DLI programs to those enrolled in traditional monolingual schools, an approach for which I have advocated throughout this chapter. Finally, both studies have addressed variability within HS groups, investigating
factors such as age of acquisition of English, SES, and home language use. These findings represent a more nuanced approach to studying bilingual development in immersion programs, and provide valuable insight into the development of inflectional morphology in DLI. In the following section, I review previous linguistic research on bilinguals’ acquisition of syntax in DLI programs.

3.5.3. Syntax

In contrast with inflectional morphology, one area in which Spanish HS typically develop robust command of the HL is in the domain of syntax, as described in Chapter 1. Despite the resilience of syntactic structures documented in HL research, there is evidence that HS in TWI experience influence from English in some areas of syntax. For example, Potowski (2007a) showed that HS frequently substituted gerunds (e.g., *me gusta yendo al parque, I like going to the park), as would be grammatical in English, in place of infinitival subjects (e.g., me gusta ir al parque, I like to go to the park). She reported that eighth grade HS also had difficulty with using the singular and plural dative clitics le and les as well as with person-number agreement morphology with gustar-type dative experiencer verbs in Spanish that do not have similar structure in English. In both cases, English has “competing” structures, suggesting possible crosslinguistic influence.

Spanish HS in TWI programs also show great optionality in their production of DOM, which requires the use of the dative case marker a with animate and specific direct objects (Torrego, 1998). Because semantic characteristics of the object are involved, this structure could lie at the syntax-semantics or internal interface. DOM is highly variable in adult and child and adult HS populations (Hur, 2020, 2021; Montrul, 2004; Montrul et al., 2015; Montrul & Bowles, 2009; Montrul & Sánchez-Walker, 2013), and appears to
be similarly vulnerable in DLI students: in an analysis of the oral narrative data from Montrul and Potowski’s (2007) study of gender agreement described above, Montrul (2011) reported that simultaneous HS produced the differential object marker in 32% of expected contexts, while sequential bilinguals with an older age of acquisition of English did so in 62% of expected contexts. The great degree of variability in the use of the differential object marker across participants suggests that DLI does not fully facilitate the acquisition of this particular structure. However, it is unclear if children in monolingual schools would exhibit similar levels of omission of the differential object marker; moreover, it is unclear if older students were more accurate than younger participants.

A final area of syntax that has been studied in DLI is that of null subjects. Owing to the rich verbal morphology of Spanish, the person/number inflection of the verb licenses a null subject when the referent has already been identified in the discourse (Camacho, 2013), known as continuous reference. In contrast, English has weak agreement morphology (White et al., 2004), and consequently the subject cannot be ascertained from verbal inflections, requiring overt expression. Because of the discursive component of null subjects, this syntactic structure has a pragmatic component, which has earned it considerable attention in research on unschooled HS populations (Austin et al., 2017; Liceras et al., 2012; Montrul, 2004a, 2006; Montrul & Sánchez-Walker, 2015; Paradis & Navarro, 2003). Generally, these studies have reported that HS produce more overt subjects in Spanish than monolinguals, likely due to the influence of English.

Sánchez et al. (2023) carried out a bidirectional study addressing the acquisition of null subjects with eighteen simultaneous English-Spanish bilingual kindergartners
enrolled in a TWI program. In their study, Sánchez and colleagues carried out a forced choice task in Spanish as well as two acceptability judgment tasks (one in English and one in Spanish) to test the acquisition of the distribution of null and overt subjects in both languages. Results showed that the HS, especially those with high levels of HL use, accepted and selected null subjects in Spanish in continuous contexts, but that there was minimal transfer of the null subject parameter to the English language task. This suggests that the acquisition of a complex linguistic structure such as null and overt subjects that requires syntactic and pragmatic knowledge in both languages was feasible for young bilinguals in the TWI program at no expense to their acquisition of the competing English property.

Such findings differ minutely from Goldin (2020b), who found that 21 Spanish HS in a TWI program between the ages of four and seven had a prolonged null subject stage in English when compared to 20 monolingually-educated peers. Paradis and Genesee (1996) discuss that in the same way that bilingual children may enjoy accelerated development or bootstrapping in cases of structural similarities between their two languages, divergence between them can also lead to a period of protracted development. These studies reveal the importance of assessing both of HS’ languages to explore the role of crosslinguistic influence.

Curiously, these results would suggest that Spanish HS are more accurate in the use of inflectional morphology and syntax at the interface of pragmatics than in core syntactic properties such dative experiencers and gerundial and infinitival complements, as well as DOM, a syntactic structure with semantic entailments. As described earlier, research on the Interface Hypothesis has yielded inconsistent results in HL acquisition,
and does not find support in these studies. As in the case of research on phonology and inflectional morphology, it is important to incorporate multiple populations of HS and to use production and comprehension tasks to address productive and receptive knowledge of HL syntactic competence, so the findings reported in this section are necessarily tentative. Furthermore, the studies evaluated here have incorporated HS of different ages and who have different quantities of exposure to Spanish at school, which considerably challenges the ability to generalize these findings.

3.5.4. Sociolinguistic Competence

Because sociolinguistic appropriateness refers more generally to discourse and pragmatics, it is often excluded from discussions of bilinguals’ grammatical repertoires. However, the ability to make appropriate linguistic choices in accordance with context is essential to using the HL across familiar, academic, and professional contexts. Potowski (2007b) conducted an analysis of HS’ ability to control sociolinguistic register with the same eighth grade participants described in the previous sections. Participants completed two letters, one expected to elicit informal register and the other requiring formal language. Two reviewers analyzed each composition and rated its formalness from 0 (informal) to 6 (formal). The averages of reviewers’ ratings foreach letter were compared to generate a difference score of formalness. Recent arrival participants obtained a mean difference of 4/6 and Spanish HS obtained 3.1/6. Therefore, HS were similar to but slightly less precise than Spanish-dominant bilinguals in controlling sociolinguistic register. It should be noted that the recent arrival participants were also not at ceiling in differentiating between formal and informal register, which suggests that linguistic appropriateness may be learned through schooling. As this is the only experimental study
to the best of my knowledge to focus on sociolinguistic competence in TWI, future research would be beneficial in this area.

3.5.5. Summary of Findings

Research on HL acquisition in DLI programs remains limited, so it is challenging to make definitive conclusions about the impact of bilingual immersion. In the area of phonology, HS appear to have similar vowel acoustics to those of their caregivers, but benefit from explicit instruction concerning the perception of lexical stress. HS who are students in DLI programs do not appear to develop the same inflectional systems as Spanish-dominant peers, as studies on tense, aspect, and mood morphology and morphological regularity show that HS in DLI programs still differ in these respects from other groups of Spanish speakers. However, children appear to continue to develop gender agreement across the immersion years, even though their systems may be different from monolingual speakers. Research on HS’ syntactic knowledge in immersion programs suggests frequent substitutions of gerunds in place of infinitival subjects, common omission of DOM, and innovations in agreement when using dative experiencer verbs such as gustar, but overall strong knowledge of null subjects in Spanish. Finally, HS appear to be similar to Spanish-dominant children in their knowledge of sociolinguistic register.

As has been described above, developing a meaningful understanding of how DLI shapes HS’ grammatical development has proven challenging because of the absence of comparisons with monolingually-educated peers. Potowski (2007a, p. 164) recognizes the need to pursue a “Study that compares L1 heritage speakers in a dual immersion program with their counterparts in transitional bilingual education programs taught mostly in
Furthermore, it is essential to measure productive and receptive knowledge of morphology and syntax separately (Gregg, 1990; Perez-Cortes et al., 2019; Prévost & White, 2000; Rothman, 2007; White et al., 2004), but most of the experiments reviewed above did not address both of these domains. Because of these key limitations, it is prudent to present future directions for research on DLI education more generally, and to discuss the importance that this body of research has both for theories of HL acquisition and for language pedagogy.

3.6. Exploring Immersion in Heritage Language Acquisition Research

Having reviewed the research from multiple fields that suggest that DLI has a favorable impact on Latinx students, I now turn to how research in these schools can contribute to HL acquisition theory and to our knowledge of best pedagogical practices for teaching HS. Research on the positive effects of bilingual education has been extensive in educational fields and in L2 acquisition; however, the exploration of HL development through immersion has received considerably less attention.

3.6.1. Contributions to Bilingualism Theory

Immersion education has the possibility to inform HL theory, much in the same ways that L2 acquisition research has been nourished by studies of immersion programs in Canada. The effect of schooling contributes both quantitatively and qualitatively to the acquisition of HLs. Regarding quantitative importance of the HL in DLI classrooms, sustained exposure to Spanish during the school day allows HS to receive more input in their HL than they would in monolingual schools. An interesting question is whether or not this sustained exposure to the HL is sufficient for HS to continue to make gains in their proficiency during or even after the immersion years, which would not necessarily
be expected in situations of monolingual schooling. Therefore, comparing children in monolingual schools to those in DLI programs is an avenue through which linguists can explore the impact of cumulative exposure across the childhood years.

Furthermore, it is important to recognize that DLI programs also have a qualitative impact on the input that children receive. As discussed in Chapter 1, the Input Quality approach has shown that some linguistic structures that are infrequent in home registers of the language may not develop in the absence of formal instruction (Pires & Rothman, 2009a, 2009b). There is evidence that there is considerable variability in monolingual speakers’ development of certain linguistic structures appear to be more conducive to use in academic and professional contexts than informal registers (Andringa & Dąbrowska, 2018; Dąbrowska, 2008, 2010, 2018; Dąbrowska & Street, 2006; Street & Dąbrowska, 2010). Therefore, comparing children’s development in DLI programs to that of individuals enrolled in traditional education programs provides us with the unique opportunity to explore how sustained exposure to two languages at school may result in different exposure to and knowledge of Spanish than would be the case of HS who learn their HL at home only.

A second way in which immersion education has contributed to second language acquisition and is positioned to make contributions to HL theory concerns the importance of language production. Research has shown that L2L of French in Canadian immersion programs need opportunities to produce their second language in order to develop higher levels of proficiency (Swain, 1985). In a study analyzing classroom language use in a TWI program, Potowski (2004) found that even in classes in which the teacher provided 100% of instruction in Spanish, the fifth-grade children that she analyzed opted to use
English more than 50% of the time when interacting with one another. Therefore, HS may not use their HL at school nearly as much as they hear and read it.

As Perez-Cortes et al. (2019) discuss, it is frequent for HS to experience asymmetrical productive and receptive capacities, so producing in the HL during immersion programs may be especially important. Goldin (2021) and Sánchez et al. (2023) found that HS in TWI programs who had greater quantities of language output showed stronger command of subject-verb agreement morphology and the distribution of overt and null subjects in Spanish, as reported previously. Therefore, research on the role of output in immersion classrooms can contribute to our knowledge of the factors that influence HL development in childhood more broadly. An additional area of research that could benefit substantially from research on language acquisition in DLI is the emergent field of HL pedagogy.

3.6.2. Contributions to Heritage Language Pedagogy

Until recently, there were few empirical studies investigating the best pedagogical practices for instructing HL learners (see Bowles, 2021; Fernández Cuena & Bowles, 2022; Potowski et al., 2009), despite Beaudrie et al.’s (2014) recognition that “More empirical classroom research with heritage learners is sorely needed.” As Swain (2000) points out, dual-language immersion research in Canada has contributed greatly to our knowledge of instructed L2 acquisition. Studies on immersion classrooms have the potential to lay the groundwork for future research on pedagogical approaches to DLI education. For instance, some form-focused instruction in immersion classrooms seems to be beneficial to or even necessary for L2Ls’ development (Harley, 1989, 1993).
To this effect, Harley (1993) discusses that it is important to utilize both experiential (learning through content instruction) and analytical (form-focused) approaches in immersion classrooms. Of particular relevance, she describes the *compensatory salience principle* (p. 251), through which it is particularly important to provide form-focused instruction for structures that have low perceptual salience, do not have considerable communicative weight, and do not occur frequently in the input. As reviewed in Chapter 1, Putnam and Sánchez (2013) describe that many of the same characteristics (i.e., low perceptual and semantic salience and frequency in the input) lead to restructuring following decreased quantities of use of the HL. For this reason, analytical approaches to HL teaching may be key in supporting the development of some aspects of Spanish as a HL. Exploring these questions would also contribute to our knowledge of instructed HL acquisition, an area with far less research than in second language acquisition. Should HS in immersion programs exhibit variability in their knowledge of subjunctive, these findings would lay the groundwork for future studies that could investigate how instructional interventions can maximize the development of this structure in the HL. This type of study would also be useful for designing curricula for high school and university HL programs.

### 3.7. Conclusion

In the present chapter, I have presented the academic, cognitive, and linguistic research on immersion schooling, with a particular emphasis on DLI. These methods of bilingual education (OWI and TWI) are additive because they focus on the development of proficiency in two languages, rather than subtractive practices in traditional schooling, where the emphasis is on development of the socially-dominant language only. As can be
seen, there has been substantially more research using standardized assessments than linguistic experiments, and with L2L than with HS.

Analyses of standardized assessment data suggest that Spanish HS in DLI programs outperform their peers in monolingual schools across content areas, and immersive exposure to Spanish positively impacts HL development at no long-term cost to English language proficiency. There is some evidence that TWI in particular promotes high school graduation in Latinx students, which is of particular importance considering this population’s elevated likelihood not to complete secondary schooling (National Center for Educational Statistics, 2018). It appears that immersion is also positive for special education students, and has an important impact on academic achievement for children with lower SES (Genesee & Fortune, 2014; Lindholm-Leary & Block, 2010).

Regarding cognitive development, studies have demonstrated that as little as one year in a TWI program is sufficient to document faster reaction times in auditory inhibition tasks compared to monolingual peers (Barbu et al., 2019). It must be noted that while these studies suggest that TWI provides Latinx children with a better chance to experience academic success, this group of children still experiences greatly disproportionate educational inequities, and wider reform is necessary to realize the maximal potential of TWI for these students (Flores & McAuliffe, 2020; Freire et al., 2021; Valdez et al., 2016). This includes ensuring that there are supports in place that give all children who participate in these programs and their families an equal voice.

Finally, the limited previous studies on bilingual education that have used linguistic methods have shown that transitional programs do not support long-term HL growth (Merino, 1983; Gathercole, 2002b). However, the research in language
acquisition on DLI is difficult to interpret for multiple reasons. Firstly, HS in immersion programs still experience variability in their morphological and syntactic systems despite considerably greater exposure to Spanish through DLI. Secondly, these studies have most traditionally not compared HS enrolled in DLI to age-matched peers in monolingual educational programs. Additionally, the results incorporate students of different age groups and who receive differing amounts of immersion in Spanish. Finally, most studies report production data without addressing receptive abilities, which prevents studying HS’ underlying knowledge of these structures.

For these reasons, it is vital to continue evaluating the role of sustained exposure to the HL through DLI education by exploring how HS in enrolled in these programs compare to their monolingually-educated peers. In Chapter 4, I address how this project takes an initial step forward in understanding HL development through DLI. In the next chapter, I will lay out the questions that guide my study and the predictions concerning HL acquisition. I also present the methods that I will use to explore these questions, and justify how my project contributes in a novel way to the multiple areas of research that I have reviewed in these chapters.
CHAPTER 4: DISSERTATION STUDY

4.1. Introduction

The first chapters of this dissertation have offered a thorough review of the three areas of research that contribute to the present study. In Chapter 1, I addressed the theories and goals of HL acquisition and described the multiple approaches to studying three levels of variability in HS (between-groups, within-groups, and within-speaker). In Chapter 2, I presented the subjunctive mood, the grammatical structure that I investigated in this dissertation, as well as its acquisition by monolingual and bilingual populations. Finally, in Chapter 3, I discussed the previous educational and linguistic research on bilingual education, particularly DLI programs, and the potential that conducting linguistic experiments in bilingual classrooms has for contributing simultaneously to our knowledge of HL acquisition and bilingual and bicultural education.

This dissertation brings together these three areas by exploring how DLI shapes Spanish HS’ acquisition of subjunctive mood. The limited research on the subjunctive in child and adolescent HS has found that patterns of exposure affect its acquisition (Dracos & Requena, 2022; Flores et al., 2017). If exposure matters in the acquisition of subjunctive mood, then it holds that children who attend a DLI program that provides HS with more exposure to Spanish, as well as those individuals who use and are exposed to Spanish most frequently outside of school, would have an advantage in the acquisition of this structure. In my dissertation, I address how exposure, including through DLI, shapes children’s productive and receptive knowledge of the subjunctive mood in intensional/deontic volitional clauses and polarity/epistemic relative clauses. In the remainder of this introduction, I spell out how my dissertation contributes to each of
these areas. In §4.2, I present the four research questions and hypotheses based upon the
available research and offer predictions for the current project. In §4.3, I discuss the
participants and schools in this study. Finally, in §4.4, I describe the tasks involved in this experiment.

4.1.1. Contributions to Heritage Language Acquisition Theory

This dissertation informs research on HL acquisition in two ways. The first
impact of this study on HL acquisition theory and research is that it addresses the gap in
knowledge concerning school-aged HS children. As Montrul (2013) discusses, research
on school-aged HS allows us to explore an age group that may hold clues in
understanding how HLs develop and change over time. Only a small number of previous
studies, mostly with a limited number of participants, have concentrated on this age range
in Spanish HS (i.e., Corbet & Domínguez, 2020; Cuza & Miller, 2015; Cuza et al., 2013;
Dracos & Requena, 2022; Guijarro-Fuentes & Marinis, 2011; Guijarro-Fuentes et al.,
2017; Potowski, 2007a, 2007b; see also Flores et al., 2017, 2019 concerning Portuguese
HS). Therefore, it is not yet clear how language development advances across the late
childhood years in HL acquisition. Exploring HS within this age range might help us to
adjudicate between theories of HL acquisition and attrition, because studies on this
population can reveal whether children develop structures that adults later restructure, or
whether certain features emerge differently in both children and adults who are HS when
compared to other populations. Moreover, the study of contexts of education is also a
useful way to explore how patterns of exposure influence the development of HLs in
children in general.
The second way that the present study contributes to HL acquisition research is by applying methodologies used to explore intraspeaker variability in studies on adult populations to bilingual children. In so doing, I complement a growing number of studies (i.e., Giancaspro, 2020; Giancaspro & Sánchez, 2021; Giancaspro et al., 2022; Hur, 2020; Hur et al., 2020; López Otero, 2020, 2022; Perez-Cortes, 2016, 2021b, 2022; Perez-Cortes & Giancaspro, 2022; Sherkina-Lieber, 2015) that focus on what factors can capture variability in HS’ grammars, rather than emphasizing their divergence from monolingual norms, as described in Chapter 1. This approach represents what Giancaspro et al. (2022, p. 484) term a “paradigm shift” in research on HL acquisition, and highlights the systematicity and complexity of HL grammars.

Very little previous experimental work (with the exception of Fernández-Dobao & Herschensohn, 2021, as reviewed in §3.5.2.1) on this specific age group has explored the role of lexical frequency on the development of inflectional morphology, and similarly, there is only one study of school-aged Spanish HS comparing their production to their receptive knowledge using multiple tasks (Guijarro-Fuentes et al., 2017). As mentioned in Chapters 1 and 2, the subjunctive has been a useful area of the inflectional system of Spanish to test intraspeaker variability in HS because it is possible to integrate this structure into different types of tasks and to select specific subordinate verbs with which to measure the effects of lexical frequency and morphological regularity. The present study contains a production task and a receptive measure with subordinate verbs that differ in lexical frequency to determine whether these factors are able to capture intraspeaker variability in HS children, as they are in adults.
There are ample studies in monolingual and bilingual first language acquisition that reveal frequency effects in the morphosyntactic development of young children (see Ambridge et al., 2015 and references therein, as well as Nicoladis et al., 2017 and Shin, 2016 for additional examples with English-French bilingual and Spanish monolingual children, respectively). In addition, research on adult HS of Spanish (Giancaspro, 2020; Hur, 2020; Hur et al., 2020; López Otero, 2020, 2022; Perez-Cortes, 2022) suggests that these bilinguals are more sensitive to the effects of lexical frequency at lower proficiency levels, which purportedly points towards patterns of HL exposure (but see Thane, 2023a concerning the relationships between these variables and current patterns of use).

Therefore, bilingual education should similarly influence the degree of activation of and proficiency in the HL, so studying children who have different contexts of exposure to the it can help us to identify the relationship between bilinguals’ sensitivity to frequency and patterns of exposure more generally.

A similar claim can be made about production and comprehension asymmetries in the HL. As reviewed in Chapter 1, there is evidence (i.e., Giancaspro & Sánchez, 2021; Perez-Cortes, 2016; Sherkina-Lieber, 2015) that adult HS can possess fine-tuned receptive knowledge of their HL while showing considerable optionality in or even avoidance of production. Perez-Cortes et al. (2019) describe how decreasing language activation can lead to a dissociation between these two domains and claim that receptive knowledge is more resistant to restructuring than production. Here again, comparing children in immersion programs with peers in monolingual schools facilitates a meaningful analysis of HL acquisition under different contexts of exposure and can show
if and how exposure shapes asymmetries between productive and receptive knowledge in children.

Furthermore, an additional advantage of testing production and comprehension separately, as supported by Putnam and Sánchez’s (2013) framework, is that it allows for a facile separation of speakers’ access to morphological knowledge and underlying syntactic representations. As Giancaspro (2016, pp. 254-255) states, “By separating the acquisition of functional features from their mapping/access, this approach acknowledges the possibility that HSs could exhibit variability with a property, even when they have acquired the functional features underlying that property.” Therefore, the study of production-comprehension asymmetries and frequency effects allows us to observe HS’ underlying knowledge separately from variability that can emerge in production. It also enables us to maximize our knowledge of children’s HL, moving beyond simply what children can produce and addressing underlying knowledge.

Both lexical frequency and production-comprehension asymmetries are inherent to Putnam and Sánchez’s (2013) feature reassembly framework driven by patterns of language use and activation. That is, when HS use their HL less frequently, these authors predict increasing asymmetries between production and comprehension and an increased sensitivity to lexical frequency. However, it is unclear whether the same patterns would be expected of younger populations such as middle-school aged HS children who have exposure to Spanish at home. Studying frequency effects and production-comprehension asymmetries can enrich our understanding of HL development in children, and may allow us to disentangle processes of language acquisition from subsequent restructuring of morphosyntactic features.
To summarize thus far, my dissertation makes two important contributions to HL acquisition research. Firstly, school-aged bilingual children are in and of themselves an understudied population in the HL acquisition literature. Therefore, this project enriches a limited body of work on this population. Secondly, this study moves away from HS’ differences at the group level and zooms in on what factors shape differences between and within individual HS children. By doing so, it can contribute substantively to HL acquisition theory by looking at intraspeaker variability within this age group, specifically whether lexical frequency and asymmetries between production and receptive knowledge affect young HS under different contexts of exposure, as they do with adults. If so (or if not), these findings have implications for how to account for such variability within models of HL acquisition. Studying production and receptive knowledge is useful because it separates HS’ underlying command of mood from their surface-level application of this structure onto individual lexical items. This accommodates the intraspeaker variability in HS’ knowledge of mood more accurately than the incomplete acquisition framework, which does not make specific claims about these factors.

Finally, this study may elucidate how formal education contributes directly to HL acquisition, in line with the studies that Kupisch and Rothman (2018) cite in their review of bilingualism research with school-aged HS in Germany. These authors argue compellingly that the differences between French and Italian HS in Germany, the former of whom received bilingual education, can be attributed to the role of academic exposure and formal literacy on the development of the HL. Relatedly, this dissertation offers
important insights into the efficacy of bilingual education on development of the HL, which in turn has implications for language policy, as addressed in the following section.

4.1.2. Contributions to Immersion and Bilingual Education

This study has clear implications for research on bilingual education because, as mentioned in Chapter 3, one of the most (if not the most) important contributions of DLI is that it provides HS with access to literacy training in and sustained academic exposure to their L1 that otherwise would likely not be available to them. A fundamental assumption is that these programs provide children with the tools to use their two languages for academic and professional success, and therefore, that these individuals acquire high levels of proficiency in their two languages. The lack of research on HL development in DLI programs highlights the prevalence of this assumption (but see Lindholm-Leary and Block, 2010 for evidence of TWI students’ higher in proficiency in a Spanish as measured using a standardized test).

Of the few studies on HL acquisition in DLI programs, only two (Gathercole, 2002b; Montrul & Potowski, 2007) have concentrated on multiple age groups, and only one (Gathercole, 2002b) has compared HS in immersion to monolingually-educated children of the same age. These studies report a positive role for immersion in the acquisition of Spanish as a HL in young children, but development into adolescence has not yet been studied. Consequently, without comparing HS who are in immersion programs to age-matched peers in traditional monolingual schools using a single experiment, it is impossible to pinpoint exactly to what extent immersion influences the development and maintenance of the HL. I address this gap by comparing two age groups with two types of exposure to the HL: fifth graders and seventh and eighth graders in a
50/50 Spanish-English DLI program and age-matched groups in a monolingual, English-speaking school. As explained in the previous section, this approach simultaneously acts as a testing ground for theories of acquisition that emphasize patterns exposure (e.g., Putnam & Sánchez, 2013), as the two contexts of education in this dissertation differ maximally in terms of the (dis)use of the HL at school.

Understanding how DLI shapes the acquisition of the heritage language lays the groundwork for future projects that can elucidate the best ways to teach, assess, and design strategies and materials for bilingual children. For instance, understanding DLI students’ knowledge of mood is a prerequisite to developing appropriate pedagogical materials and curricula for supporting their development of this structure and to integrating the subjunctive into multiple content areas. The subjunctive is a particularly complex structure within the Spanish verbal system, which makes it particularly useful for providing insight into these questions.

4.1.3. Contributions to Research on Subjunctive Mood

Finally, the present dissertation contributes to our understanding of the acquisition of subjunctive mood in bilingual populations. Although the available evidence concurs that exposure impacts HS children’s (Dracos & Requena, 2017; Flores et al., 2017) and adults’ (Perez-Cortes, 2016) acquisition of the subjunctive, it is unclear precisely how this variable shapes adolescents’ knowledge of mood. On one hand, Flores et al. (2017) found that patterns of exposure to the HL affected Portuguese HS’ rate of acquisition of mood in tandem with age, whereby the participants in this study with only one Portuguese-speaking parent converged on the rates of subjunctive production of HS with two Portuguese-speaking parents later in development, by age thirteen. In contrast, Dracos
and Requena (2022) showed that exposure and proficiency affected HS’ knowledge of the subjunctive, regardless of age. However, there were far fewer HS in Dracos and Requena’s study that were in the age range where children in Flores et al. (2017) found considerable growth in children’s knowledge of this structure, which means that the absence of an effect of chronological age in the latter study is less straightforward to interpret. Furthermore, the Portuguese and Spanish subjunctive are utilized in slightly different contexts (see Jesus, 2012 or Marques, 2013 for analyses of the Portuguese subjunctive), which makes comparing these two studies less feasible given the differences in the underlying structure of subjunctive mood. Therefore, additional data are needed with pre-adolescent and adolescent HS children to better understand these populations’ subjunctive mood knowledge in Spanish.

Because the later-acquired use of subjunctive mood in relative clauses is often more variable in adult Spanish HSs’ grammars than the use of the subjunctive in volitional clauses such as with the verb querer (Giancaspro, 2019; Montrul, 2009; Montrul & Perpiñán, 2011), the former may require more exposure, making it more susceptible to input effects. To test this claim, I will compare earlier-acquired intensional subjunctive following the frequent volitional verb querer (to want) to later-developed mood alternations in relative clauses, which represents the polarity subjunctive in the epistemic modal base.33 Furthermore, there is as yet no study on bilingual children’s

---

33 I recognize that selecting these two contexts of subjunctive does not allow me to distinguish between the role of syntactic context – intensional versus polarity – and modal base – deontic versus epistemic – in the acquisition of mood. As discussed in Chapter 2, there is evidence that both considerations characterize HS’ acquisition and resultant knowledge of mood, which is a topic of ongoing interest in the literature on the acquisition of the Spanish subjunctive. Irrespective of whether it is the modal base or the syntactic context that affects acquisition, volitional and relative clauses differ
acquisition of mood alterations in relative clauses, allowing my study to address a gap in knowledge, although Dracos and Requena (2022) have already evaluated subjunctive knowledge in volitional clauses.

Recall that in the monolingual acquisition of Spanish, children use the subjunctive consistently in volitional clauses such as with the verb *querer* by age five (Dracos et al., 2019), but mood selection in relative clauses continues to develop as late as age seven (Dracos et al., 2019; Pérez-Leroux, 1998). Therefore, there are up to two years of additional exposure that monolingual speakers have between when they acquire the intensional subjunctive in deontic contexts and when they master mood alterations in relative clauses, which is an instance of polarity subjunctive in the epistemic modality. Since bilingual acquisition of morphosyntax can proceed in a protracted fashion when compared to monolinguals of both languages (e.g., Paradis & Genesee, 1996), the acquisition of both contexts of mood may extend into the school years in bilingual populations. Consequently, exposure to the HL during this time is likely especially relevant for the acquisition of the subjunctive, particularly in relative clauses that develop later on, even in monolingual populations. Having framed my study in the context of the bodies of research reviewed in the previous chapters, I dedicate the remainder of this chapter to presenting the questions and methodologies that will allow me to contribute to these areas.

---

from one another at both the semantic and syntactic levels. Therefore, independently of whether it is the syntactic context or modal base that affects acquisition, these two contexts of subjunctive are different in both respects, which maximizes the differences between when they are acquired.
4.2. Research Questions and Hypotheses

The four research questions (herein, RQs) in this study were organized by the level of variability they addressed: between-groups, within-group, and within-speaker. The first RQ addressed differences between HS and SDB in their knowledge of the subjunctive in volitional and relative clauses, which targeted between-groups differences. RQ2 related to how DLI and frequency of use of Spanish affected pre-adolescent and adolescent HS’ acquisition of the subjunctive, and RQ3 addressed the role of chronological age. Therefore, RQ2 and RQ3 addressed variability between subgroups of HS. RQ4 was related to intraspeaker variability in these bilinguals’ knowledge of subjunctive mood, specifically the role of lexical frequency and the asymmetries between production and receptive knowledge. Answering each of these questions has implications for the areas of research laid out above.

4.2.1. Research Question #1

Do HS and SDB adults produce similar quantities of subjunctive mood in volitional clauses (intensional/deontic subjunctive) and relative clauses (polarity/epistemic subjunctive)?

Two generalizations can be made across all studies on the acquisition of the subjunctive mood with Spanish HS reviewed in §2.3. First, at the group level, there is abundant evidence that SDB adults, defined here as bilinguals who were raised monolingually in Spanish outside of the continental United States, use the subjunctive more frequently than HS (e.g., Bookhammer, 2013; Dracos & Requena, 2022; Giancaspro, 2019a, 2020; Potowski, 2007a, 2007b). Secondly, as a group, HS use the subjunctive more consistently in volitional clauses, such as with the verb querer, that are
part of the intensional syntactic context in the deontic modal base than in relative clauses, which are an instance of polarity subjunctive in the epistemic modal base (Giancaspro, 2019a; Montrul, 2009; Montrul & Perpiñán, 2011; van Osch et al., 2017). Therefore, the differences between groups and within HS’ knowledge of the subjunctive between the two syntactic contexts in this study are well-documented.

Regarding the first generalization, previous research has shown that Spanish-dominant bilingual adults, who represent a substantial component of the input stream for HS, do not appear to experience restructuring of subjunctive mood in the volitional clauses context. In his controlled mood production and selection experiment, Giancaspro (2020) found that Spanish-dominant adults used the intensional subjunctive in 100% of instances following the matrix item para que, which introduces purpose clauses. Additionally, Bookhammer (2013) found that in sociolinguistic interviews, Spanish-dominant adults in his study used the subjunctive in 99% of volitional clauses. Finally, Potowski (2007b) reported that a small group of SDB adolescent children who had recently arrived in the United States used the subjunctive categorically on an elicited production task in a volitional clause. Therefore, there does not appear to be any variability in the use of subjunctive mood in volitional clauses in the input that HS receive, either from adults or from children who are comparable in age to those who completed this study.

Regarding the subjunctive in relative clauses, Bookhammer (2013) found a slight degree of variability with Spanish-dominant bilingual adults, who used the subjunctive in 84% of the expectedly nonpresuppositional contexts in his analysis of subjunctive production through naturalistic interviews. In contrast, Giancaspro (2019a) reported that
the Spanish-dominant bilinguals in his experimental study used the subjunctive categorically in relative clauses, and in fact found overextension of this mood to contexts that were expected to elicit the indicative. In Potowski (2007a, 2007b), all of the SDB children used the subjunctive in the relative clause sentence as well. In these studies, all groups of HS used the subjunctive less frequently than the SDB. Based upon this evidence, I hypothesized that the SDB adults would use the subjunctive more consistently than HS children.

To address the second generalization, previous research has consistently demonstrated that despite overall less use of the subjunctive than Spanish-dominant bilinguals, HS use this mood more frequently in deontic contexts in volitional clauses following verbs such as querer than in relative clauses or sentential complements (Giancaspro, 2019a; Montrul, 2009; Montrul & Perpiñán, 2011; van Osch et al., 2017). The level of optionality in subjunctive mood production and comprehension mirrors the order of acquisition of monolingual Spanish-speaking children (Blake, 1983; Dracos et al., 2019; Pérez-Leroux, 1998), which implies a relationship between age of acquisition of the multiple syntactic contexts of this structure and their overall degree of consistent use by HS of Spanish. However, there is yet to be a study on bilingual children’s acquisition of subjunctive mood in relative clauses. Based upon the available evidence from adult research, I hypothesized that within the HS group, earlier-acquired use of subjunctive in volitional clauses would be produced and selected more consistently than in relative clauses. Specifically, I made the following predictions:

• SDB adults would produce and select the subjunctive mood more than HS children in both volitional clauses and relative clauses.
• HS would produce and select the subjunctive more frequently in volitional clauses than relative clauses.

4.2.2. Research Question #2

Do exposure to Spanish through DLI and current frequency of HL use impact differences between HS in their acquisition of subjunctive mood?

Based upon the research reviewed in the previous chapters and summarized in §4.1, there is a role for patterns of exposure in HS children’s acquisition of the subjunctive mood in Spanish (Dracos & Requena, 2022) and Portuguese (Flores et al., 2017), a closely related language. Since immersion boosts exposure to the HL, it is plausible that children in bilingual schools show considerable growth in command of subjunctive mood morphology throughout the years that they are enrolled in these programs. This is precisely what Lindholm-Leary and Block (2010) found in their analysis of Spanish standardized test scores; however, their data do not report growth in HS’ knowledge of specific linguistic structures and do not use experimental methods to address language development.

Nevertheless, the role of exposure to the HL appears to be relevant in morphosyntactic development, even in the case of DLI: as reviewed in Chapter 3, Sánchez et al. (2023) found that the amount of HL exposure outside of school influenced the degree to which kindergartener English-Spanish bilinguals enrolled in a DLI program patterned with Spanish-speaking monolingual adults in their judgments of null and overt subjects. Moreover, Montrul and Potowski (2007) found that HS children in DLI who were sequential bilinguals with more overall exposure to Spanish were more consistent in gender agreement than simultaneous bilinguals who likely had cumulatively less
exposure to the HL. Finally, young children’s command of subject/verb agreement was contingent on levels of output despite participating in a Pre-K/Kindergarten immersion program (Goldin, 2021). Because even within contexts of HL immersion, patterns of language exposure outside of school affect grammatical development, both DLI as well as frequent use of Spanish outside of school should support HS’ acquisition of the Spanish subjunctive mood.

No study on the HL acquisition of the subjunctive has compared the roles of school and home exposure to Spanish. In fact, only Gathercole’s (2002b) study on grammatical gender has done so, as mentioned above. If exposure is directly tied to the development of subjunctive mood, as has been shown in previous experimental studies on Spanish and Portuguese HS (Dracos & Requena, 2022; Flores et al., 2017) and in longitudinal analyses of two sets of bilingual siblings (Andersen, 2001; Silva-Corvalán, 2014), then students in a DLI program would plausibly use greater quantities of subjunctive mood morphology in both volitional and relative clauses given they have more daily exposure.34

It is likely that mastering the later-acquired uses of subjunctive mood such as in relative clauses requires more exposure to the HL. Dracos and Requena (2022) are the only researchers to study HS children’s subjunctive mood knowledge across multiple contexts, but their study compared adverbial clauses to volitional clauses, which develop in closer proximity to one another in monolingual acquisition than the two contexts in this study. Therefore, the effect of exposure may be even more pronounced for the

34 As shown in §5.2.2 and §5.2.3, the students who attended the DLI and monolingual schools were matched for exposure to Spanish outside of school.
polarity/epistemic subjunctive in relative clauses when compared to the
intensional/deontic subjunctive following the matrix verb *querer*, given the monolingual
development of the former takes place after the onset of schooling. In fact, the subtle
contrast between moods in relative clauses may benefit from explicit instruction, which
may or may not occur in DLI programs, but by definition would not take place in
monolingual schools. If we follow the argument that exposure (and possibly instruction)
affects the acquisition of later-acquired contexts of subjunctive mood, it was
hypothesized that the difference between the immersion and non-immersion groups
would be greater for the late-acquired polarity/epistemic subjunctive. Therefore, I made
the following predictions:

- DLI students would produce and select more subjunctive mood in both volitional and
  relative clauses than their peers who were educated monolingually in English.
- Children who used Spanish more frequently across non-school contexts would
  produce and select the subjunctive in volitional and relative clauses more frequently.
- DLI and frequency of use of Spanish would have a larger impact on HS’ production
  and selection of subjunctive mood in relative clauses than in volitional clauses.

### 4.2.3. Research Question #3

*Do older HS children use more subjunctive mood than younger children?*

Existing research on HS children acquiring the subjunctive mood provides
conflicting evidence regarding the role of chronological age. On one hand, Dracos and
Requena (2022) reported that HS children’s rates of subjunctive production did not
increase noticeably across age groups (between four and fourteen years of age), but there
were few older children in their study. In contrast, in Portuguese, Flores et al. (2017)
found that patterns of exposure affected the rate of acquisition of mood, but that the oldest HS in their study (ages thirteen to eighteen) showed similar levels of mood production regardless of exposure, producing subjunctive in around 80% of the expected contexts. This suggests that HS continue to acquire the Portuguese subjunctive mood over time and into adolescence, and that quantity of input affects the rate of development, but not its ultimate attainment. A possible reason for the differences between these studies is that the children in the Portuguese study were enrolled in an afterschool HL program. This also reflects the additive sociolinguistic circumstances surrounding European bilingualism in comparison with those of in the United States, and also more closely reflects the circumstances of children enrolled in a DLI school.

Although these findings may seem contradictory, they may not be incompatible. Firstly, Dracos and Requena (2022, p. 22, citations and italics original) had a limited sample of older HS children, which they acknowledge may have affected their results: “With a larger sample size of older child HSs (our study only included $n = 10$ children aged 10 or older), we might find, like Flores et al. (2017) does for child HSs of European Portuguese, a developmental trend during these later school-aged years.” Secondly, it is possible that HS could converge on similar production rates at a particular age, yet some (but not necessarily all) bilinguals might continue to show higher levels of mood past that age due to patterns of sustained language exposure.

In these studies, chronological age is one way of operationalizing total exposure to the HL. In the context of reduced exposure, children may require a longer time period to develop late-acquired structures such as the subjunctive mood, as Flores et al. (2017, 2019) demonstrated. Therefore, children in an immersion school who have more overall
exposure to Spanish would likely be less susceptible to age effects because they receive
more HL input at school than HS children in monolingual schools. For this reason, it was
hypothesized that HS would use more subjunctive as they grow older, particularly in
contexts where educational exposure to the language is limited.

Therefore, fifth grade students in DLI who have already received six years of
bilingual education plausibly would have received extensive input with which to acquire
the contexts of subjunctive mood under investigation, which emerge in monolingual
populations by ages five and seven, respectively. Since quantity of input appears to affect
the amount of time necessary to acquire mood, it was anticipated that children in DLI
would have already received enough exposure to Spanish to use the subjunctive in both
contexts. However, given that HS children in a monolingual school do not have the same
quantity of input as HS in DLI, it was predicted that these participants would show age
effects, whereby older children in monolingual schools would produce and select more
subjunctive, similar to Flores et al.’s (2017) participants with less overall exposure to
Portuguese. If these predictions were to hold, this would imply that patterns of exposure
influence the rate of acquisition of subjunctive mood in children who are HS of Spanish,
but that its acquisition continues well beyond the beginning of schooling and into
adolescence. To summarize, I made the following predictions with regards to RQ3:

- HS in the DLI school would produce similar levels of subjunctive mood in both fifth
  and seventh and eighth grades.
- HS in the monolingual school would produce more subjunctive in seventh and eighth
  grades than in fifth grade.
4.2.4. Research Question #4

Do lexical frequency and asymmetries between productive and receptive knowledge account for intraspeaker variability in children’s use of subjunctive mood?

As mentioned previously, there is a gap in research on lexical frequency in pre-adolescent and adolescent HS. Past studies on young children have shown that frequency temporarily accounts for variability in their knowledge of tense/aspect morphology (Ambridge et al., 2015; Nicoladis et al., 2007; Shin, 2016). Therefore, the role of lexical frequency becomes less impactful as children acquiring their L1 receive more exposure over time. However, research has demonstrated that lexical frequency affects adult HS of Spanish in their production of multiple morphosyntactic structures, including the subjunctive mood (Giancaspro, 2020; Hur, 2020; Hur et al., 2020; López Otero, 2020, 2022; Perez-Cortes, 2022; Thane, 2023b). Putnam and Sánchez (2013) predict that this variable becomes more influential on bilingual grammars across the lifespan, such that adults with lower patterns of exposure and use will restructure morphosyntactic structures on less frequent lexical items before this process extends to more-frequent ones. With respect to production and comprehension asymmetries, once again, there is no clear picture of if or how school-aged children differ in these two domains. However, existing research on adult HS has shown that participants who have lower frequency of use show greater asymmetries between production and interpretation in their knowledge of the subjunctive mood (Perez-Cortes, 2016).

Based upon the relationship between exposure and the impact of lexical frequency posited by Putnam and Sánchez (2013), it was hypothesized that the lexical frequency of the subordinate verb, as measured using language corpora, would affect HS in a
monolingual school in their production and receptive knowledge of the Spanish subjunctive given their lower exposure to Spanish. Regarding asymmetries between production and receptive knowledge, it was anticipated that the HS in the monolingual school would select more instances of subjunctive mood on a receptive task than they would produce this form under the pressures of production, as was the case for participants with less HL use in Perez-Cortes’ (2016) study. Therefore, I made the following predictions for RQ4:35

- HS in monolingual schools will not be sensitive to lexical frequency in their production and selection of subjunctive mood.
- HS in monolingual schools will not show asymmetries between productive and receptive knowledge in their use of subjunctive mood.
- HS in monolingual schools will be sensitive to lexical frequency in their production and selection of subjunctive mood.
- HS in monolingual schools will show asymmetries between productive and receptive knowledge in their use of subjunctive mood.

4.3. Participant and School Characteristics

4.3.1. Participants

To investigate these questions, five participant groups took part in this study. In order to explore how age and immersion affect the acquisition of mood, two age groups of DLI students who are Spanish HS, as well as two matched groups of monolingually-educated peers, must be considered. In addition, a group of SDB adults who represented

---

35 Note that a null effect for this predictor does not imply a total absence of an underlying relationship, but rather that one is not detectable with the data and statistical modeling used.
HS’ input within a bilingual context participated to explore if the structures under study had undergone contact-induced change. This design therefore adopted a “multiple baselines” approach. The use of multiple baselines shifts the focus away from a comparison between HS and monolinguals, and concentrates instead on simultaneously comparing HS to SDB and to other HS.\(^{36}\) Because most U.S. DLI programs end at the conclusion of elementary school, fifth graders represented HL development at the conclusion of these programs. Furthermore, seventh and eighth graders were the same age as the children in Potowski’s (2005, 2007a, 2007b) studies and represented HL development around the onset of adolescence.

Under the multiple baselines approach, the SDB adults were the baseline for all four groups of HS children. Secondly, the fifth and eighth grade students in the monolingual school served as baselines for the fifth and eighth grade groups in the DLI program, respectively: the monolingual students represented HL development in traditional schools, which in turn exposed the role of DLI in HS’ acquisition of Spanish when controlling for participants’ proficiency levels, patterns of cumulative exposure to Spanish, and current HL use. Finally, the two groups of fifth grade students served as a baseline for the seventh and eighth grade students in DLI and the monolingual school respectively. Since older HS children may show growth with age (Flores et al., 2017), the fifth graders in both schools served as the baseline for the respective seventh and eighth grade groups in each. To summarize, the fifth grade groups served as a baseline for the

---

\(^{36}\) One may argue that this approach does not reflect the notion of baseline as it is traditionally defined, because it does not provide a single point of comparison to non-HS populations. However, the use of this term reflects the focus on comparing HS to one another, with the goal of unearthing the myriad factors that shape the differences between these speakers.
seventh and eighth grade students, the MLS-5 and MLS-7/8 groups served as the baseline for the MLS-7/8 and DLI-7/8, and the SDB served as the baseline for all of the children who participated in the study.

4.3.1.1. Spanish-dominant bilingual group. Following Rothman and Pascual y Cabo (2012), comparison groups of bilingual speakers are more effective than monolinguals in reflecting the differences between HS and other populations given that both groups experience the effects of bilingualism. This comparison group was made up of 18 SDB adults (average age: 33.6, SD = 10.19) who were graduate students and language education professionals. These speakers were raised monolingually in a Spanish-speaking country and were living and working in the United States at the time of the study. Their average length of residence in the United States was 9.5 years (SD = 10.1, underscoring that there was considerable variability in the time spent in an English-speaking environment). Most of these participants were in northern New Jersey at the time of data collection, but some were in other regions. The SDB retained high levels of proficiency in Spanish as measured using the adapted Diploma del español como lengua extranjera exam from Montrul & Slabakova (2003) that has been used extensively in studies on bilingual populations of Spanish (average score: 47.7/50, SD = 1.68)\textsuperscript{37} and the children’s proficiency test (see Table 6 and §4.4.1.2). Their proficiency in English was not assessed, but ranged from high intermediate to superior. All SDB lived in a Spanish-speaking country until they were at least twelve years old, which research on language attrition has suggested to be the “threshold” age in being resistant to extensive first

\textsuperscript{37} Note that this average does not include data from one adult participant, who was unable to complete the proficiency measure due to technical issues.
language (L1) attrition or restructuring (Ahn et al., 2017; Bylund, 2009; Hakuta & D’Andrea, 1992; Schmid, 2012). Participants were from a total of 7 Spanish-speaking countries or territories: Chile, Colombia, Dominican Republic, Peru, Puerto Rico, Spain, and Venezuela. These bilinguals represented the input that second-generation HS (that is, the children of Spanish-speaking individuals born outside of the United States, such as most of those in the present study) receive, and therefore were one of the baselines for them.

4.3.1. Fifth Grade Groups. There were two groups of HS in the fifth grade (ages 10-11): the DLI students (herein, the DLI-5 group) at a charter school and the students at a monolingual school (herein, MLS-5 group). Many DLI programs run through the elementary years and terminate in the fifth grade, so the DLI-5 group purportedly represents the “end product” of immersion schooling in these instances. The DLI-5 group had participated in a 50/50 DLI program that offers six years of bilingual education. Therefore, these students had extensive exposure to Spanish across the content areas during the entirety of their immersion program. 30 students in the 50/50 DLI program, presented at greater length below, participated in the experiment. However, eight of these students had begun the program within a year of or during the COVID-19 pandemic, during which time there was limited instruction in Spanish at this school (in grade three or subsequently) as will be explained in §4.3.2.1. As a result, these students had considerably less exposure to Spanish at school than the remaining nineteen who had been in the program since kindergarten, so these eight students were placed into the MLS-5 group. In addition to these seven participants, there were 23 students from the
traditional monolingual school. Therefore, there were 23 students in the DLI-5 group and 30 students in the MLS-5 group.

However, in the final sample, three students were removed from the DLI-5 group: one did not complete the tasks, one did not produce responses that were comprehensible on the audio recorder used for the experiment, and one did not respond to the prompts per the instructions, opting to use verbs that were not part of the experiment. Furthermore, nine of the students in the MLS-5 group were discarded for similar reasons: three students did not provide a single instance of a conjugated verb (see methodology section below), implying that they did not understand the instructions for the experiment, despite practice trials; two did not use verbs that were part of the experiment, two students’ data were incomprehensible due to issues with the audio recorder, and two students did not complete the experiment. Therefore, there were 20 participants in the DLI-5 group and 21 participants in the final MLS-5 group whose data were available for analysis.

As will be addressed below, the participants in these groups lived in comparable communities and their schools were similar with the exception of the language(s) of instruction, making their exposure to Spanish at school the primary difference between them at the group level. Therefore, the MLS-5 served as a second baseline for the DLI-5, as the former group purportedly reflected the latter’s knowledge of subjunctive if these participants had not attended an immersion school. Furthermore, the fifth grade students were similar in age to the participants with the highest exposure to Portuguese in Flores et al. (2017) at the time when this group showed increases in subjunctive mood production, which makes them comparable with this population. Finally, the fifth-grade participants were three years older than the oldest children to pass a Theory of Mind test
and to master mood contrasts in Pérez-Leroux’s (1998) study. This ruled out maturational constraints in these HS’ knowledge of mood in relative clauses.

4.3.1.2. Seventh and Eighth Grade Groups. Similar to the fifth grade groups, there were two groups of seventh and eighth grade students (ages 13-14): those who had participated in the DLI program (herein, DLI-7/8) and those in the monolingual school (herein, MLS-7/8). Once again, because the demographic characteristics of the communities in which both groups resided were quite similar, including nearly identical percentages of English language learners and home Spanish speakers in each district (see §4.3.2), both groups differed primarily in their exposure to Spanish at school. The DLI-7/8 students attended the same school as the DLI-5 group, but had graduated from the 50/50 program in which the younger participants were still enrolled. Because many of the students in the eighth grade at the DLI program enrolled in the late elementary years, there were not enough children in eighth grade. Therefore, seventh graders from the DLI school, but not the monolingual school, were also recruited for this study. These children were at a similar age to when the Portuguese HS with lower amounts of home exposure in Flores et al. (2017) began to reach the same rates of subjunctive mood production as the higher-exposure group. Furthermore, these HS were the same age as the participants in Potowski’s (2005, 2007a, 2007b) studies on HS in a middle school DLI program.

As with the fifth-grade groups, the MLS-7/8 children were representative of the DLI-7/8 group had they not attended an immersion school. There were 24 students in the DLI-7/8 group from the immersion school (ten in seventh grade, fourteen in eighth grade), and fifteen students in the MLS-7/8 group in the monolingual school. To be consistent with the formation of groups with the fifth-grade participants, ten members of
the DLI-7/8 group who joined the immersion school in third grade or later (that is, who received a maximum of three years of TWI) were moved to the MLS-7/8 group. Two of the MLS-7/8 participants were removed from the study, one who did not complete the tasks and the other who did not provide any conjugated verbs (similar to some students in the DLI-5 group), contra the instructions and examples explained in the methodology section below. Three of the students in the DLI-7/8 group did not complete the experiment. Therefore, in the final sample, there were 23 students in the MLS-7/8 group and eleven students in the DLI-7/8 group. Table 4 summarizes the final organization of groups and participants below.

<table>
<thead>
<tr>
<th></th>
<th>SDB</th>
<th>DLI-7/8</th>
<th>MLS-7/8</th>
<th>DLI-5</th>
<th>MLS-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>18</td>
<td>11</td>
<td>23</td>
<td>19</td>
<td>22</td>
</tr>
</tbody>
</table>

Table 4. Summary of groups of participants submitted to analysis.

4.3.1.3. Consistency across HS Participants. Most of the students in the four HS groups had been classified as ELLs in earlier grades, and according to the school demographic information reviewed below, approximately three fourths of families in both districts indicated that Spanish was their home language. The majority of children in the HS groups were therefore sequential bilinguals who had early exposure to Spanish and came into contact with English at school. The school report documented that over three quarters of these participants were “economically disadvantaged,” although it is unclear precisely how socioeconomic status is defined in these documents. Therefore, the students in both schools had similar socioeconomic status and bilingual profiles.

---

38 It can be assumed that this classification is related to or synonymous with students’ qualifications for free and reduced-price lunch.
To address individual differences between them, participants completed a biographical questionnaire and a proficiency measure that I will explain in greater detail in §4.4.1. I provide an overview of each group’s average frequency of use of Spanish and proficiency based upon these instruments below in Table 5. I carried out multiple tests to verify that proficiency, patterns of exposure to Spanish at home, and frequency of use of Spanish outside of school were consistent between the DLI-5 and MLS-5 groups as well as between the DLI-7/8 and MLS-7/8 groups, respectively, which in turn minimizes the likelihood that a confounding variable could account for differences between them. These tests of equivalence are described in greater length in §5.2 in the following chapter.

<table>
<thead>
<tr>
<th>Variable</th>
<th>SDB</th>
<th>DLI-7/8</th>
<th>MLS-7/8</th>
<th>DLI-5</th>
<th>MLS-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of Spanish</td>
<td>15.2</td>
<td>15.6</td>
<td>15.6</td>
<td>15.8</td>
<td>14.5</td>
</tr>
<tr>
<td>Proficiency</td>
<td>12.3</td>
<td>11.9</td>
<td>11.9</td>
<td>9.4</td>
<td>9.0</td>
</tr>
</tbody>
</table>

Table 5. Background characteristics by participant group.

4.3.2. Schools

Data collection took place at two schools in northern New Jersey. One was a DLI charter school in which Spanish was the partner language; in the monolingual public school, students did not have exposure to Spanish through academic instruction. Both schools are located in predominantly Latinx communities where Spanish, which is the home language for most of their student bodies, is spoken regularly.

4.3.2.1. Immersion Charter School. The bilingual school in which data collection from the DLI-5 and DLI-7/8 groups took place is located in central New

---

39 As reported on a language questionnaire; see §4.4.1.1.

40 As reported on the Bilingual English-Spanish Assessment, maximum 14 points (Peña, Gutiérrez-Clellen, Iglesias, Goldstein, & Bedore, 2014); see §4.4.1.2.
Jersey. The school was open to HS and L2L of Spanish, making it similar to TWI programs, but fewer than ten students across the three grades studied did not have Spanish as a home language. I therefore refer to this school as a DLI program, as it is not clear if the data collected are representative of one- or two-way immersion. As a charter school, this institution adheres to the New Jersey State Learning Standards (New Jersey Department of Education, n.d.-a) while providing DLI in English and Spanish from kindergarten through fifth grade following a 50/50 model. The decision to select a 50/50 English-Spanish DLI program for the present project was to evaluate if and how the most conservative model of immersion education can lead to advantages in HS’ acquisition of the HL. That is, if HS in a 50/50 DLI program use more subjunctive mood compared to peers in monolingual schools, other immersion programs with a greater concentration of the HL as partner language instruction would plausibly facilitate similar results (but see Stevens, 1983 for a counterexample with French L2L).

Over the course of these six years, children receive academic instruction in both languages in language arts, mathematics, natural science, and social studies. The school follows a “one week, one language” approach in each content area. Therefore, children are expected to develop strong command of age-appropriate academic knowledge through instruction in both English and Spanish across the content areas. A potential limitation of this approach, however, is that these students could rely on English during Spanish lessons, which reduces the need to engage in use of the HL for academic purposes (see Potowski, 2004 concerning the use of English during partner language instruction). After fifth grade, all students move to monolingual instruction but received multiple hours of advanced Spanish language courses per week. Therefore, the DLI-7/8
group had received sustained form-focused exposure to Spanish at school but had not had
academic instruction in the partner language since fifth grade.

According to the academic year 2020-2021 state-issued school report, the most
recent at the time of data collection (New Jersey Department of Education, 2021a), 392
students (0% non-binary, 52% female, 48% male) were enrolled across nine grades, with
an average of 43 students per grade. 86% of students’ families identified as Hispanic,
8.7% as black or African American, 2.6% as Caucasian, 2.3% as Asian, and 0.5% as
multiracial. 66.3% of students’ families reported Spanish as the primary home language
and 21.7% of the school’s population was classified as English language learners.
Concerning socioeconomic status, 78.8% of students were reported to be economically
disadvantaged.

With respect to the teaching staff, a total of 36 teachers were employed at the
school, 30% of whom identified as Hispanic. Teachers had an average of nine years of
classroom experience, and 61% held a postgraduate degree. There was a student-teacher
ratio of 11:1. The three teachers who worked with the fifth and eighth grade students
were native speakers of Spanish; two were raised in the Dominican Republic and one in
Mexico. All had high levels of proficiency in English, but only taught content in Spanish.
Therefore, the students evaluated in this experiment received input from native speakers
of both languages, which has been shown to affect bilingual L1 acquisition (Unsworth et
al., 2019).

The school offered admission to students in four surrounding municipalities
entering kindergarten using a lottery system. All families who lived in these districts were
eligible to apply for admission, but students with siblings already enrolled in the school
were given preference. Importantly, there was no academic test required for admission, which minimized the likelihood that students with access to test preparation or who had above-average intelligence quotients were more likely to enroll in this program. In turn, this minimized the probability that above-average intelligence or higher socioeconomic status could have affected the outcomes of this project, since these variables could impact test scores. Finally, this assured that these students would be comparable to those in the monolingual public middle school, which by definition has open admission.

In alignment with New Jersey educational law, students complete the Partnership for Assessment of Readiness for College and Careers (PARCC; New Jersey Department of Education, n.d.-b) standardized assessment once per year. Students in grades four through eight completed English language arts and mathematics assessments, and students in sixth grade carried out a natural science exam. Furthermore, all English language learners complete the World-Class Instructional Design and Assessment ACCESS test (World-Class Instructional Design and Assessment, n.d.) in all grades to measure English language development. Finally, teachers conducted annual reviews of all students’ growth in reading using Pearson’s Developmental Reading Assessment-2 (Beaver & Carter, n.d.). Because the school wanted to minimize standardized testing, there were no assessments used to evaluate students’ Spanish language development, as all of these materials were administered in English. Therefore, there was no specific knowledge of Spanish development using norm-referenced assessments in this bilingual school. According to state assessment data, during the 2020-2021 academic year, 38.1% of students were classified as proficient in English language arts, and 27.7% of students were classified as at grade level in mathematics.
It is important to note that the COVID-19 pandemic led to modifications in instructional format at the school. A teacher informed me that instruction in Spanish decreased from daily to weekly using videoconferencing software between March of 2020 and the remainder of the 2019-2020 academic year due to the emergency school closure. Spanish language instruction was provided asynchronously for the entirety of the 2020-2021 school year, and students returned to full in-person learning during the year in which I collected data. Since there were no proficiency data available prior to the unforeseen school closure, unfortunately, it is not possible to determine whether this influenced students’ HL development.

4.3.2.2. Monolingual School. The monolingual school was located in the adjacent county to that of the charter school, within 35 miles. All students in fourth through eighth grades in this district attended this school. The state-issued school report from academic year 2020-2021, the most recent at the time of data collection (New Jersey Department of Education, 2021b), indicates that 656 students (0% non-binary, 52% female, 48% male) were enrolled across the five grades, with an average of 131 students per grade. 86% of students’ families identified as Hispanic, 5% as black or African American, 5.5% as Caucasian, 0.6% as Asian, and 2.7% as multiracial. 22.9% of the school’s population was classified as English language learners, and 77.3% of students’ families reported Spanish as the primary home language. With regards to socioeconomic status, 77.3% of all students were classified as economically disadvantaged.

There were 62 teachers at the school, 8.1% of whom identified as Hispanic. Teachers averaged ten years of classroom experience, and 50% held a postgraduate
degree. There was a student-teacher ratio of 11:1, as in the charter school. The demographics of this district were thus considerably similar to those of the DLI charter school, with the same percentage of Hispanic students (86%) and similar percentages of English language learners (21% versus 22%) and economically disadvantaged students (78% versus 77%). Therefore, the two schools’ student bodies and classroom structure were highly similar, reducing the likelihood that variables such as socioeconomic status, amount of English language learners per class, or student-teacher ratio could have affected the outcomes of this study.

However, students in the monolingual school had higher overall academic growth as measured by standardized assessment scores. Regarding academic achievement in the monolingual school, 50% of students obtained grade-level proficiency in English language arts and 36% reached grade-level mathematics proficiency. The higher performance on standardized assessments in English could be due to the absence of instruction in Spanish, considering that HS in DLI programs may require until fifth grade to reach the grade-expected proficiency level in both languages (Christian et al., 2004).41 Furthermore, if difficulties in academic performance at the charter school were due to limited English proficiency in the early elementary years, they might be most evident in the younger grades, which were included in the school report. In contrast, the data from

---

41 It cannot be overemphasized that this need not be taken as an argument against immersion schooling. To the contrary, students in DLI programs reach or exceed grade-level standards, and do so in two languages, while there is little that is known about HS students’ development of the HL in monolingual schools (but see Merino, 1983 for a sketch of how the transition from transitional bilingual education to monolingual education has implications for bilingual development). Since bilingual students are often not equitably assessed in their two languages, what may appear to be a lag in proficiency or an off-target performance during the early elementary years very plausibly does not persist into later primary education.
the monolingual middle school began in grade four, after children have five years of exposure to English, so the findings from the two schools are not fully comparable in this regard.

### 4.4. Materials

There were two background measures and two experimental tasks in the present study. In this dissertation, *background measures* refer to those components of the experiment that provide information about variables such as frequency of use of Spanish and proficiency that do not directly concern the subjunctive mood. In contrast, *experimental tasks* are those activities in which children needed either to produce or recognize the subjunctive mood. In addition, before completing any of the background measures or experimental tasks, all children’s parents or guardians and all adult participants signed a consent form agreeing to participation. The consent form was available in English and in Spanish.

#### 4.4.1. Background Measures

There were two background measures in the present study: a language questionnaire and a proficiency measure. The SDB completed an additional task, which was a second proficiency test that has been used extensively in adult research on Spanish as a HL (Montrul & Slabakova, 2003). This proficiency test was not part of the present analysis but was used in the descriptive data above to show that the SDB had retained a high level of proficiency in Spanish despite being immersed in English-speaking communities.

**4.4.1.1. Language Questionnaire.** The language questionnaire was developed to elicit information on participants’ language development. This questionnaire addressed
participants’ age of onset of acquisition of English, parental and sibling language use, and their frequency of HL use. To measure frequency of use, participants indicated how frequently they used Spanish in five contexts (with parents, with other family members, with friends, in public, while watching television). Each context contained a 0-5 Likert scale with descriptors for each point to increase consistency and reduce subjectivity. The sum of these Likert scales was used as participants’ frequency of use score in the statistical modeling. Table 6 lists the descriptors for each point of the Likert scales. Since all children in this study were at least ten years of age, it was determined that they were old enough to answer these questions independently, which further improved accuracy compared to relying on parental estimations of children’s language use and preferences that could vary outside of the home.

<table>
<thead>
<tr>
<th>Number</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Never/nunca</td>
</tr>
<tr>
<td>1</td>
<td>Hardly ever/casi nunca</td>
</tr>
<tr>
<td>2</td>
<td>3-4 times per week/3-4 veces por semana</td>
</tr>
<tr>
<td>3</td>
<td>1-2 times per day/1-2 veces por día</td>
</tr>
<tr>
<td>4</td>
<td>Every day, almost always/Cada dia, casi siempre</td>
</tr>
<tr>
<td>5</td>
<td>Always/siempre</td>
</tr>
</tbody>
</table>

Table 6. Descriptors for Likert scales for frequency of use on questionnaires.

Furthermore, the questionnaire contained questions about the number of parents who spoke English and Spanish at home. These data determined the number of monolingual Spanish-speaking parents, which represented parental language use that was addressed in the statistical modeling.42 This data was used to group HS into (A) HS who

42 Previous studies (e.g., Unsworth, 2013) have established measures of cumulative exposure, but it is important to recognize that in this study, I use the term family language use with the understanding that there may not be a linear relationship between which languages parents are able to speak and which are spoken at home. That is, it is important to recognize that far more than parents’ ability to speak each of a HS’ two (or more) languages does not necessarily or linearly correlate with practices of home
had one or two bilingual parents, regardless of the degree of proficiency, and (B) HS who had monolingual Spanish-speaking parents and were “true” sequential bilinguals because their first exposure to English came outside of the home. Because not all students had siblings, sibling order, which has been shown to affect the acquisition of Spanish as a HL (e.g., Bridges & Hoff, 2014; Silva-Corvalán, 2014), was not taken into account. In addition to these questions, adults answered additional questions concerning their attitudes towards Spanish and their frequency of use of individual words. Appendix C contains a list of questions from this instrument.

4.4.1.2. Proficiency Measure. All participants completed an abbreviated version of the Spanish morphosyntax portion of the Bilingual English-Spanish Assessment (BESA; Peña et al., 2014). The BESA assesses knowledge of articles, object clitics, preterit aspect, subjunctive mood, and the present progressive. For the present study, I included the test items for all morphosyntactic properties as part of the proficiency assessment with the exception of the subjunctive, as including this structure would be tautologous. This left a total of fourteen items; each target response was worth one point, and the sum of correct responses was used to operationalize proficiency in the statistical modeling. The same proficiency measure was used in Dracos and Requena’s (2022) study on subjunctive mood with HS children. Although the BESA is traditionally used with childhood populations only, I opted to use this proficiency measure with adult participants as well for two reasons. Firstly, recent research on immersion schooling (see language use. That is, it is feasible that bilingual parents make conscious decisions to use a specific language at home. Therefore, I use the term family language exposure rather than cumulative exposure throughout this dissertation because there may not necessarily be a relationship between which languages parents are able to speak and the degree of exposure that HS have to each of those languages.
Sánchez et al., 2023) has utilized this approach. Secondly, using a single proficiency measure for adults and children allows for facile comparisons across groups; as mentioned, the SDB also completed a second proficiency test.

4.4.2. Experimental Tasks

There were two experimental tasks in the study: a 16-item elicited production task and a 23-item forced choice task. These two tasks were centered around a communicative context in which a mother shares how she wants her twin daughters to care for their younger brother, Juanito, while they are away at sleepaway camp. Both tasks were administered using laptop computers over Qualtrics software. As in many previous studies, the prompts were displayed on a screen, but their responses were oral. A computerized software known as Phonic was embedded into the Qualtrics survey to record participants’ responses on the production task.

The twelve verbs listed in Table 7 were used in each task in the subordinate clause to evaluate the use of the subjunctive mood. Eight of these verbs tested the intensional subjunctive in the deontic modal base in volitional clauses following querer, and four tested the polarity subjunctive in epistemic modal base in object relative clauses. The set of twelve verbs was selected along a continuum of lexical frequency as reported in Davies’ (2016) Corpus del español and the Real Academia Española’s (2001) CORPES XXI. The Corpus del español contains over 2,000,000,000 tokens from websites from around the Spanish-speaking world, and the CORPES XXI contains 350,000,000 tokens, approximately 70% of which are from American Spanish. Thane (2023a) demonstrated that the distribution of forms in these corpora correlates with that of HS’ self-reported lexical ratings, suggesting that they provide accurate approximations of the
frequency of individual words in these speakers’ input. The composite score in Table 7 represents the average of the standardized frequencies in each corpus and was used in statistical modeling to address the role of lexical frequency.

<table>
<thead>
<tr>
<th>Verb</th>
<th>Condition</th>
<th>Davies</th>
<th>CORPES XXI</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>amar (to love)</td>
<td>Intensional</td>
<td>60,260</td>
<td>28,864</td>
<td>–0.7899906</td>
</tr>
<tr>
<td>bajar (to go down)</td>
<td>Polarity</td>
<td>284,649</td>
<td>62,583</td>
<td>–0.3307535</td>
</tr>
<tr>
<td>cuidar (to care for)</td>
<td>Intensional</td>
<td>208,160</td>
<td>26,928</td>
<td>–0.5990516</td>
</tr>
<tr>
<td>entrar (to enter)</td>
<td>Polarity</td>
<td>207,551</td>
<td>129,316</td>
<td>–0.1262862</td>
</tr>
<tr>
<td>hablar (to talk)</td>
<td>Polarity</td>
<td>868,442</td>
<td>255,835</td>
<td>1.35214385</td>
</tr>
<tr>
<td>llamar (to call)</td>
<td>Intensional</td>
<td>303,936</td>
<td>207,733</td>
<td>0.36669497</td>
</tr>
<tr>
<td>llevar (to carry)</td>
<td>Intensional</td>
<td>1,192,620</td>
<td>301,032</td>
<td>1.99934124</td>
</tr>
<tr>
<td>mirar (to look at)</td>
<td>Intensional</td>
<td>186,441</td>
<td>197,558</td>
<td>0.16083119</td>
</tr>
<tr>
<td>nadar (to swim)</td>
<td>Polarity</td>
<td>27,224</td>
<td>5,128</td>
<td>–0.9444295</td>
</tr>
<tr>
<td>peinar (to brush hair)</td>
<td>Intensional</td>
<td>6,151</td>
<td>3,173</td>
<td>–0.9819534</td>
</tr>
<tr>
<td>pintar (to paint)</td>
<td>Intensional</td>
<td>45,606</td>
<td>22,466</td>
<td>–0.8393897</td>
</tr>
<tr>
<td>tratar (to treat)</td>
<td>Intensional</td>
<td>590,952</td>
<td>203,027</td>
<td>0.73284334</td>
</tr>
</tbody>
</table>

Table 7. Verbs used in tasks by lemma frequencies in two language corpora.

Concerted effort was taken to ensure that there were no confounding factors in the selection of verbs that could have influenced speakers’ mood selection with the subordinate verbs in question. Since morphological regularity has been shown to affect HS’ production of subjunctive mood (Giancaspro et al., 2022; López-Beltrán Forcada, 2022; Perez-Cortes, 2022), all of these verbs were morphologically regular. Given that conjugation class can affect lexical access or decomposition (Bowden et al., 2010), all twelve verbs pertained to the most-frequent first conjugation (–ar) and were matched for syllable length (disyllabic). Additionally, they were syntactically consistent within each condition: the eight verbs used with the intensional condition were transitive, as they were also used to test DOM morphology, and the four subordinate verbs used in the polarity condition were all intransitive. In the EPT, there were no postverbal adjuncts to avoid the possibility that the presence of additional content affected HS’ production of mood.
4.4.2.1. Elicited Production Task. The Elicited Production Task (herein, EPT) targeted the production of subjunctive mood. In the children’s version, there were total of sixteen items; the adults’ version contained 47 items. Both versions included a trial item before the first sentence. The task was situated within a communicative context, as there was a brief written prompt before each sentence written in the third person about the mother’s desires for her children while they are at the summer camp. The instructions informed participants that they needed to complete the final sentence using any form of the word in parentheses (the infinitival form of the corresponding verb from Table 7), as well as any other necessary words. Participants could not change or move any of the words in the prompt (see sentences (17) and (18) below for examples).

There were eight volitional clauses and four relative clauses targeting the subjunctive, such that each verb in Table 7 occurred one time each. There were four indicative distractors in the children’s EPT, and the adult version contained ten total indicative distractors and 25 distractors targeting gerundial and infinitival complements. Therefore, the children’s EPT contained sixteen items and the adults’ EPT contained 47 items. Figure 10 summarizes the adult version of this task, as shown in Appendix D; Figure 11 summarizes the structure of the children’s version of the EPT, as shown in Appendix E. The stimuli were presented in the same order in both versions, with distractors inserted between the target items in the adult version.
In the volitional clauses, the matrix verb *querer* (*to want*) expectedly lexically selected the subjunctive mood. This tested the early-acquired intensional subjunctive in deontic modality. There were eight sentences that elicited the subjunctive mood in volitional nominal clauses following the phrase *quiere que las hermanas...* (*she wants the sisters to...*), as in (17) below. The indicative distractors for this condition utilized the matrix clause *cree que las hermanas* (*she believes that the sisters...*), as in (18). Note that

---

43 In Figures 10-13, red represents expected subjunctive contexts, yellow represents expected indicative contexts, and green represents expected infinitival contexts.
in all of these sentences, the differential object marker *a* was missing, as this experiment also tested HS’ knowledge of DOM in each of these sentences that is analyzed in a separate experiment. Each of the eight verbs from the intensional condition in Table 7 was used once in these sentences to test the effect of lexical frequency.

(17) 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.*

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

(18) La mamá cree que las hermanas son muy generosas con sus amigas. ¿Qué cree la mamá? *Cree que las hermanas _________ (CUIDAR) los otros niños bien.*

*The mother thinks that the sisters are very generous with their friends. What does she believe? She believes that the sisters _________ (CARE FOR) their other friends.*

In the case of the sentences targeting subjunctive mood following the volitional verb *querer*, each of the eight verbs from the intensional condition in Table 7 was used once. The use of these verbs allowed for lexical frequency to be analyzed in the statistical modeling. The lexical frequency was not calculated for the indicative condition, as it was not part of the RQs.

In addition, participants completed a minimum of six object relative clauses targeting polarity contexts of indicative and subjunctive mood use. Four items elicited subjunctive morphology following the phrase *no sabe si hay personas que...* (*the mother doesn’t know if there are people who...*), as in example (19), which are nonpresuppositional relative clauses. Children also completed two relative clauses eliciting indicative morphology, and adults completed four, to reduce the predictability of the mood selected in the subordinate clause. These items occurred following the phrase
sabe que hay personas que (the mother knows that there are people that...), as in example (20), which implies presupposition (restricted relative clauses). In the nonpresuppositional relative clauses, each of the four verbs from the polarity condition listed in Table 7 was used once to test the effect of lexical frequency.

(19) La mamá se preocupa porque no sabe si Juanito va a tener amigos. ¿Qué no sabe la mamá? No sabe si hay personas que _________ (HABLAR) con Juanito.

The mother is worried because she doesn’t know if Juanito is going to have friends. What does she not know? She doesn’t know if there are people who will _________ (TALK) with Juanito.

(20) Juanito tiene miedo de la piscina. Si juega con los amigos, se va a divertir mucho. ¿Qué sabe la mamá? Sabe que hay personas que _________ (JUGAR) con Juanito en la piscina.

Juanito is afraid of the pool. If he plays with his friends, he is going to have a lot of fun. What does the mother know? She knows that there are people who _________ (PLAY) with Juanito in the pool.

To verify that the relative clauses elicited the subjunctive morphology as anticipated, a brief piloting procedure was necessary. One stimulus that was expected to elicit subjunctive mood in relative clauses was chosen at random (using the verb bajar; see Appendix D) and piloted with a group of 34 monolingually-raised Spanish speakers in Spain. Some participants had beginner or intermediate knowledge of English, and one was fluent in both languages. Of the 34 participants, only one individual utilized the indicative with the anticipated verb; 17 produced past or present subjunctive mood, and 15 produced conditional morphology. Therefore, the relative clause stimuli, all of which contained the same matrix phrase (no sabe si hay personas que...) reliably implied nonpresupposition based upon 33/34 responses elicited in this sample.

4.4.2.2. Forced Choice Task. In the Forced Choice Task (hereafter, FCT), participants again read prompts related to the mother’s desires for her children while they
are away at sleepaway camp. There was a total of 23 items in the children’s version of the task and 55 items in the adults’ version. In this exercise, participants needed to select which one of two answers that described each prompt that they felt sounded best. The two sentences were minimal pairs that differed only in the use of either 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 having to produce in the HL.

Since the FCT was administered in written format, the subordinate verbs were boldfaced in both sentences to emphasize the difference between them. The same conditions in the EPT were repeated a second time in the FCT, and the same verbs listed in Table 7 were used in novel sentences. Therefore, the same four conditions were repeated in the FCT: volitional (subjunctive) clauses, as in (21), intensional indicative clauses with *creer*, as in (22), nonpresuppositional relative clauses, as in (23), and restrictive relative clauses, as in (24).

(21) La mamá sabe que las hermanas no siempre hablan con Juanito. ¿Qué quiere la mamá?
   a. *Quiere que las hermanas lo miran cuando hablan con él.
   b. 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?*
   a. *She wants the sisters to look at (*IND) him when they talk with him.*
   b. *She wants the sisters to look at (SUBJ) him when they talk to him.*
   [Intensional subjunctive]

(22) Las hermanas no tienen miedo ninguno de alturas y siempre se tiran al agua en la piscina. ¿Qué cree la mamá?
   a. Cree que las hermanas saltan al agua.
   b. *Cree que las hermanas salten al agua.

   *The sisters aren’t afraid of heights at all and always jump into the water in the pool. What does the mother think?*
a. She believes that the sisters jump (IND) in the water.

b. She believes that the sisters jump (*SUBJ) in the water.

[Intensional indicative]

(23) Si las hermanas no están con Juanito, la mamá no sabe si Juanito quiere bajar el tobogán solo. ¿Qué no sabe la mamá?

a. *No sabe si hay personas que bajan el tobogán con Juanito.

b. No sabe si hay personas que bajen el tobogán con Juanito.

If the sisters aren’t with Juanito, the mother worries that he won’t want to go down the slide by himself. What does the mother not know?

a. She doesn’t know if there are people who go down (*IND) the slide with Juanito.

b. She doesn’t know if there are people who go down (SUBJ) the slide with Juanito.

[Polarity subjunctive]

(24) La mamá siempre habla con Juanito mientras come. Hay muchas personas con las que puede hablar en el campamento. ¿Qué sabe la mamá?

a. Sabe que hay personas que charlan con Juanito mientras come.

b. *Sabe que hay personas que charlen con Juanito mientras come.

The mother always speaks with Juanito when he eats. There are many people with whom he can talk at the camp. What does the mother know?

a. She knows that there are people who will chat (IND) with Juanito while he eats.

b. She knows that there are people who will chat (*SUBJ) with Juanito while he eats.

[Polarity indicative]

In addition, the verbs from the intensional condition were repeated in eight distractor sentences testing the differential object marker a. The adults’ version also completed 25 additional distractors concerning infinitival and gerundial complements. The full transcript of this task may be found in Appendix F, and Figure 12 offers a summary of its structure. The children’s version of the task is summarized in Figure 13 and shown in Appendix G.
4.4.3. Procedure

This study was carried out in compliance with Rutgers University’s Institutional Review Board (IRB Protocol #2021001902). The participating schools provided written permission for data collection, and all children’s parents or guardians signed a consent form prior to their participation. Adult participants who carried out the study also signed an informed consent form virtually. Children completed the tasks in their classrooms in the following order: language questionnaire, BESA proficiency test, EPT, and FCT. The students in the DLI school completed the activities in their classrooms during two class
periods, and those in the monolingual school did so during a single 75-minute session in the school cafeteria. All students used their school-provided laptops to complete the experiment. The SDB group completed the experiments online using the same software, but I was not present for their data collection. If children finished the experiment ahead of time, they were invited to complete an oral narrative by describing the fairytale *Little Red Riding Hood (Caperucita Roja)* in the past tense; all adults also completed this task. The oral narrative data were not part of the present experiment but will serve for future analysis of children’s tense-aspect systems.

4.5. Chapter Summary

I began this chapter by providing an overview of how my dissertation contributes to the three areas of research that I have reviewed thus far. Firstly, it contributes to HL acquisition theory and research by studying an underexplored age group of bilingual children, testing the role of home and school exposure, and applying methodologies that concern intraspeaker variability to this population. I also explore how exposure affects the acquisition of subjunctive mood in Spanish-English bilingual children. Secondly, I contribute to our knowledge of DLI, because this study tests the long-held assumption that these programs provide HS with an advantage in the acquisition of their HL when compared to monolingual schools. It also lays the groundwork for the development of curricular materials and language learning objectives for bilingual schools (see Thane et al., 2022).

The four RQs in my dissertation test the differences in mood knowledge between SDB and HS, the role of exposure through DLI and outside of school, age, and intraspeaker variability on HS children’s knowledge of subjunctive mood. RQ1 compares
the HS groups to the SDB and targeted differences in the two contexts of subjunctive mood evaluated in this study. Secondly, RQ2 explores whether DLI and HL use and exposure influence each group’s use of the subjunctive in the intensional/deontic context following the matrix verb *querer* and polarity/epistemic contexts in relative clauses. Thirdly, RQ3 investigated whether participants use the subjunctive increasingly frequently as they become older, implying that acquisition continues into the adolescent years. Finally, RQ4 addressed intraspeaker variability, specifically with regards to lexical frequency and asymmetrical knowledge between production and comprehension. These questions therefore explore all three levels of variability sketched in Chapter 1: between-groups, within-group, and within-speaker.

It was hypothesized that exposure to Spanish through DLI and outside of school would shape HS’ knowledge of mood, but that all participants would still improve with age, as Flores et al. (2017) demonstrated. I also predicted that HS in DLI would show greater consistency with SDB in their use of the subjunctive than the children in the non-immersion groups, and in both the intensional/deontic and polarity/epistemic contexts. Predictably, HS in monolingual schools would be more sensitive to age effects, but DLI students would not. Finally, I proposed that HS in monolingual programs would show asymmetries between subjunctive production and selection on a receptive task, as well as lexical frequency effects, but that DLI students would not, given the extra exposure that these bilinguals have to the HL throughout childhood.

To address these RQs, I adopted a “multiple baselines” approach by comparing four groups of HS children who differed in terms of their exposure to Spanish at school and their chronological age to one another and to a group of adult SDB. The children
were recruited from two schools of comparable demographic characteristics where the primary difference was the language(s) of instruction. Furthermore, I explored the role of lexical frequency and differences in productive and receptive knowledge through an EPT and a FCT, allowing for principled insight into these intraspeaker variables. In the following chapter, I address the methods that I used for statistical analyses and present the results of this study.
CHAPTER 5: DATA ANALYSIS AND RESULTS

5.1. Introduction

In the previous chapter, I proposed the four research questions that guide my project and offered predictions for each based upon the areas of investigation addressed in Chapters 1, 2, and 3. I also described the experiment used to investigate these questions. In this chapter, I describe how I analyzed the data from my experiment and provide the results of this study. This chapter is organized as follows: in §5.2, I explore the relationships between participant groups’ proficiency level, patterns of home exposure to Spanish, and frequency of use to verify that these variables were unlikely to contribute to the results of the present study. After presenting the participant statistics, in §5.3, I provide an analysis of HS’ production tendencies, providing details about their innovations where subjunctive mood was expected. Having laid out these results, in §5.4, I present and analyze the descriptive data, followed by the inferential statistics in §5.5. Subsequently, in §5.6, I conduct an analysis of individual differences based upon percentages of use of the subjunctive mood. In §5.7, I conclude the chapter with a summary of these results.

I used RStudio (R Core Team, 2022) to carry out all of the statistical analyses and to prepare the visualizations presented throughout this chapter. Specifically, I utilized the emmeans (Lenth, 2021), lme4 (Bates et al., 2015), lmerTest (Kuznetsova et al., 2017), sjPlot (Lüdecke, 2021), tidyverse (Wickham et al., 2019), and TOSTER (Lakens, 2017) packages. All deidentified data and coding are available on a GitHub repository (pthane/DLI_Dissertation) to maximize reproducibility.
5.2. Participant Statistics

The first step in the analysis was to verify that participants in the immersion program and the traditional monolingual school were comparable in their morphosyntactic proficiency, current exposure to Spanish outside of the classroom, and parental language use. This was necessary to highlight immersion as the primary difference that distinguished between groups’ exposure to Spanish, minimizing the possibility that other confounding factors could have affected results. Moreover, it was essential to determine whether the children from the DLI school who had been reassigned to the monolingual control group due to late enrollment in the program produced similar levels of subjunctive mood as those individuals in the same group who were students at the monolingual school. To do so, I conducted four two one-sided tests (TOST) using the TOSTER package (Lakens, 2017) in RStudio. The equivalence bounds were set at $|0.5|$. In the first three TOST, type of schooling (immersion for the DLI-5 and DLI-7/8 groups versus monolingual schooling for the MLS-5 and MLS-7/8 groups) was the grouping factor. In the final TOST, school (DLI charter school versus monolingual school) was the grouping factor.\footnote{Recall that some students were reassigned to the monolingual groups. Therefore, this grouping differed slightly from that of the first three TOST.}

5.2.1. Proficiency

In the first TOST, I evaluated the similarity between the Bilingual English-Spanish Assessment (BESA; Peña et al., 2014) scores of the participants in each category (DLI versus monolingual school). As described in §4.4.1.2, eighteen questions were included in the BESA test in my experiment, of which four tested command of the
subjunctive mood. Therefore, for the present study, participants’ score was the number of anticipated responses to the fourteen remaining questions on the morphosyntax subset of the BESA in Spanish that did not address the subjunctive. This variable was standardized prior to analysis. This analysis showed that there were no differences between the two groups’ BESA scores at a level that was significant at the $p < .05$ level, as shown in Table 8 and visualized in Figure 14. Therefore, it does not appear that there were differences between groups with regards to their proficiency as measured using the BESA Spanish morphosyntax subsection.

<table>
<thead>
<tr>
<th>Metric</th>
<th>$t$</th>
<th>DF</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-test</td>
<td>0.0080</td>
<td>64.68</td>
<td>.9935</td>
</tr>
<tr>
<td>TOST Upper</td>
<td>2.1095</td>
<td>64.68</td>
<td>.0193</td>
</tr>
<tr>
<td>TOST Lower</td>
<td>−2.0934</td>
<td>64.68</td>
<td>.0201</td>
</tr>
</tbody>
</table>

Table 8. Results of TOST for HS participants’ BESA proficiency scores.

Figure 14. Results of TOST for differences between HS participant groups’ morphosyntactic proficiency.
5.2.2. Patterns of Family Language Use of Spanish

In the second TOST, I compared the patterns of patterns of home HL exposure as measured through the number of monolingual Spanish-speaking parents to assign a numerical value with which to compare participants in the two schools. To do so, the number of monolingual Spanish-speaking parents was computed for each participant, as this represented an approximation of exposure to and use of the HL at home. Participants with two bilingual parents received a score of 0, those with one monolingual Spanish-speaking parent received a score of 1, and those with two monolingual parents received a score of 2. This variable was then standardized and submitted to analysis. As illustrated in Table 9 and shown in Figure 15, there were no differences between groups that were significant at the $p < .05$ level. Therefore, patterns of home language exposure between the students in the DLI school and those in the traditional monolingual school were comparable with the two schools’ demographic reports, which is in line with the two schools’ demographic reports described in §4.3.2.1 and §4.3.2.2.

<table>
<thead>
<tr>
<th>Metric</th>
<th>$t$</th>
<th>DF</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-test</td>
<td>-0.1448</td>
<td>64.77</td>
<td>.8852</td>
</tr>
<tr>
<td>TOST Upper</td>
<td>1.9546</td>
<td>64.77</td>
<td>.0274</td>
</tr>
<tr>
<td>TOST Lower</td>
<td>-2.2444</td>
<td>64.77</td>
<td>.0141</td>
</tr>
</tbody>
</table>

Table 9. Results of TOST for HS participants’ patterns of language exposure.
5.2.3. Frequency of Use of Spanish

In the third TOST, I compared the frequency of use of Spanish outside of school between participants in the two schools. As discussed in §4.3.1, frequency of use was the sum of the five 1-5 Likert scales on the background questionnaire (maximum 25). The variable was standardized prior to analysis. The results of this test are summarized in Table 10 and Figure 16. There were no differences between groups with regards to frequency of use of the HL outside of school that were significant at the \( p < .05 \) level. This argues against the possibility that differences in patterns of HL use could have affected the results, which is an important consideration in the light of previous findings that HL exposure and use affects the acquisition and maintenance of the subjunctive in heritage varieties (Flores et al., 2017; Perez-Cortes, 2016).

<table>
<thead>
<tr>
<th>Metric</th>
<th>( t )</th>
<th>DF</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-test</td>
<td>0.0686</td>
<td>64.39</td>
<td>.9454</td>
</tr>
<tr>
<td>TOST Upper</td>
<td>2.1762</td>
<td>64.39</td>
<td>.0166</td>
</tr>
<tr>
<td>TOST Lower</td>
<td>-2.0389</td>
<td>64.39</td>
<td>.0227</td>
</tr>
</tbody>
</table>
Table 10. Results of TOST for HS participants’ frequency of HL use.

Figure 16. Results of TOST for differences between HS participant groups’ frequency of use of Spanish.

5.2.4. Effects of Subjunctive Use in Monolingual Groups by School

Because the MLS-5 and MLS-7/8 groups were comprised of students from the monolingual school as well as those from the DLI school who joined the program in third grade or later, it is possible that the students who attended the DLI program during these years, but not before, showed an advantage over their peers in monolingual classrooms in subjunctive production and selection. The decision to remove participants from the DLI school who began attending in third grade or later is because, as mentioned in §4.3.2.1, Spanish language instruction changed during this time due to COVID-19. Therefore, it was necessary to determine if rates of subjunctive production and selection across tasks were similar between the children enrolled in the two schools.

In this TOST, I computed the average rate of subjunctive production and selection across contexts and tasks for each participant and standardized this value. I then
compared the students from this group in the monolingual school to those of the middle school. The results of this analysis are shown in Table 11 and Figure 17. Although the difference between the two groups was significant at the $p < .05$ level, the size of the effect was negligible. This argues against the fact that the partial immersion in Spanish disproportionately affected the children from the DLI school who were reassigned to the MLS-5 and MLS-7/8 groups.

<table>
<thead>
<tr>
<th>Metric</th>
<th>$t$</th>
<th>DF</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-test</td>
<td>2.3688</td>
<td>1038.0</td>
<td>.0180</td>
</tr>
<tr>
<td>TOST Upper</td>
<td>10.7455</td>
<td>1038.0</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>TOST Lower</td>
<td>-6.0077</td>
<td>1038.0</td>
<td>&lt; .0001</td>
</tr>
</tbody>
</table>

Table 11. TOST comparing subjunctive use by school across MLS-5 and MLS-7/8 groups.

Figure 17. Results of TOST for differences in average use of the subjunctive across students in the MLS groups in each school.

5.2.5. Summary of Participant Statistics

To summarize, the results of these measures show that the fifth, seventh, and eighth grade students who entered the DLI school prior to third grade do not appear to differ in proficiency, patterns of parental/home HL exposure, and frequency of use of
Spanish from age-matched students in monolingual classes or who began the DLI program in the late elementary school period. Therefore, any differences between these groups would likely be attributable to patterns of exposure to Spanish at school, as tested in the present experiment. Furthermore, the data presented in §5.2.4 do not show any differences between the children in the MLS-5 and MLS-7/8 groups who attended the monolingual school and those who joined the DLI program in third grade or later. This suggests that the immersion students who joined the DLI program towards the end of the elementary school years showed no differences from peers who had been enrolled in the monolingual program since the beginning of elementary school, supporting the decision to collapse these two subgroups into the MLS-5 and MLS-7/8 participant pools. In the following section, I turn towards the descriptive data concerning subjunctive mood use in each of these groups as well as the SDB adult baseline.

5.3. Subjunctive Responses and Innovations

For all statistical analyses, described at length in §5.5, production or selection of the subjunctive was the binary dependent variable. Responses with present tense subjunctive mood inflections were assigned a score of 1, including if there was incorrect person/number agreement, but past tense, infinitival, incorrect mood, or alternative innovative forms received a score of 0. Given there were 93 participants and twelve stimuli each in both the EPT and FCT that targeted subjunctive mood, there were a total of 1,116 possible data points for each task, and a total of 2,232 data points in the entire experiment. Given the EPT allowed participants greater flexibility in the forms they could produce, it is important to report and analyze the HS’ innovations place of subjunctive mood inflections in the expected contexts. Although, as reviewed in the
following section, there were instances in which subjunctive forms were used in contexts expected to elicit the indicative, the focus of this section is on innovations in those instances that targeted the production and selection of subjunctive mood on the EPT and FCT, respectively.

In 75/1,116 potential observations (6.7%) in the expected subjunctive contexts in the EPT, participants did not save their response on the audio recorder or produced a response that was uninterpretable, either due to poor audio quality or technical issues. This left 1,043 subjunctive observations in the EPT for analysis across participants. 492/1,043 responses contained the subjunctive (47.1%), and 551/1,043 responses contained alternative forms (52.8%). The majority of alternatives in the data were indicative present simple forms, although there were other forms produced. Of the 551 non-subjunctive responses in the contexts expected to elicit subjunctive morphology, multiple alternatives were produced, ordered from most to least frequent in Table 12.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>No. of responses</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicative present simple</td>
<td>403</td>
<td>73.1%</td>
</tr>
<tr>
<td>Infinitives</td>
<td>61</td>
<td>11.0%</td>
</tr>
<tr>
<td>Modal constructions, indicative present simple</td>
<td>34</td>
<td>6.1%</td>
</tr>
<tr>
<td>Periphrastic future with <em>ir a</em> + infinitive</td>
<td>29</td>
<td>5.2%</td>
</tr>
<tr>
<td>Indicative future simple tense</td>
<td>9</td>
<td>1.6%</td>
</tr>
<tr>
<td>Miscellaneous forms that could not be identified</td>
<td>6</td>
<td>1.0%</td>
</tr>
<tr>
<td>Imperfect subjunctive</td>
<td>5</td>
<td>0.9%</td>
</tr>
<tr>
<td>Periphrastic future with <em>ir a</em> + modal + infinitive</td>
<td>2</td>
<td>0.3%</td>
</tr>
<tr>
<td>Preterit indicative</td>
<td>2</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

Table 12. Innovative alternatives to subjunctive mood by number of responses.

Therefore, participants produced non-subjunctive forms more frequently than the expected subjunctive forms in the expected contexts. Most generally, HS used the indicative present simple, often with modal verbs, in place of subjunctive mood. The tendency to use alternative constructions is documented in the research literature.
(Giancaspro, 2019a); however, participants also produced infinitival forms and some past and future tense forms. Having spelled out HS’ tendencies in using alternatives to the subjunctive mood, in §5.4, I present participants’ mood production and selection tendencies through an analysis of the descriptive statistics from this study.

5.4. Descriptive Data

Following the comparison of participant groupings, I now turn to a review the descriptive data based upon the EPT, FCT, proficiency measure, and language questionnaire. I start with a comparison of subjunctive and indicative mood use, and follow with an analysis of the two types of subjunctive mood studied in the EPT and FCT. I continue with descriptive analyses of the factors hypothesized to influence between-speaker and within-speaker variability. It should be noted that these statistics do not go beyond the level of group-level means, which means that multivariate analyses are necessary to corroborate these trends, as addressed in §5.5.

5.4.1. Subjunctive-Indicative Contrast

In the following section, I provide an analysis of group-level use of mood by comparing the use of subjunctive and indicative moods across tasks. Table 13 summarizes participants’ production of each mood within each group and condition.45

<table>
<thead>
<tr>
<th>Group</th>
<th>Subjunctive with querer</th>
<th>Indicative with creer</th>
<th>Subjunctive in relative clauses</th>
<th>Indicative in relative clauses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EPT</td>
<td>FCT</td>
<td>EPT</td>
<td>FCT</td>
</tr>
<tr>
<td>SDB</td>
<td>100%</td>
<td>97.9%</td>
<td>100%</td>
<td>99.0%</td>
</tr>
<tr>
<td>DLI-7/8</td>
<td>55.2%</td>
<td>77.5%</td>
<td>54.5%</td>
<td>56.6%</td>
</tr>
<tr>
<td>MLS-7/8</td>
<td>60.5%</td>
<td>76.0%</td>
<td>63.6%</td>
<td>66.6%</td>
</tr>
<tr>
<td>DLI-5</td>
<td>36.4%</td>
<td>56.2%</td>
<td>90.1%</td>
<td>53.7%</td>
</tr>
<tr>
<td>MLS-5</td>
<td>37.2%</td>
<td>55.9%</td>
<td>79.6%</td>
<td>67.0%</td>
</tr>
</tbody>
</table>

Table 13. Percentage of mood production and selection by group, task, and structure.

45 Note that the absence of indicative-targeting restrictive relative clause distractors in the children’s FCT results in one less condition in this task than in production.
Table 13 and Figure 18 show that participants exhibited robust knowledge of indicative mood in production, both following the weak intensional matrix verb creer, which categorically elicits indicative morphology, and in restrictive relative clauses following sabe que hay personas que. The SDB produced the indicative following creer (to believe) and the subjunctive following querer (to want) at ceiling, as well as the indicative in restrictive relative clauses; however, their production of subjunctive was variable with the subjunctive in nonpresuppositional relative clauses.

![Production of Mood by Group and Condition](image)

**Figure 18.** Production of indicative and subjunctive by group on FCT.

However, the mood selection data, summarized in Table 13 and Figure 19, provide unique results. Although the SDB group showed ceiling effects in their use of the subjunctive and indicative with querer and creer, respectively, their selection of the subjunctive in the nonpresuppositional relative clause condition was variable, as in production. Intriguingly, all HS groups with the exception of the MLS-5, who purportedly had the least cumulative exposure to Spanish given their younger age and
participation in a monolingual school, selected the subjunctive more with *querer* than they selected the indicative with *creer*. This invites the possibility that HS may continue to master the contrast between moods even in the relatively “straightforward” intensional conditions comparing purportedly obligatory uses of each mood during this age range. The overextension of the subjunctive in contexts of presupposition has been documented in previous research (Giancaspro, 2019; Perez-Cortes, 2021b), but generally in polarity contexts, and not where only one mood is considered to be grammatical in most theoretical accounts (see §2.2.2).

**Figure 19.** Selection of indicative and subjunctive by group on FCT.

### 5.4.2. *Use of Subjunctive Mood Across Groups*

As shown in Figure 20, the SDB participants used the subjunctive in the expected contexts an average of 85.5% of the time, with similar levels across the EPT and FCT, but did not do so categorically. Therefore, it is plausible either that the adults had experienced contact-induced change or that the nonpresuppositional relative clause
stimuli did not elicit the subjunctive mood as anticipated. I return to this topic with a discussion of both possibilities in the following chapter. However, there is considerably less production and selection of the subjunctive in HS children, suggesting that SDB adults still use this structure more often. While seventh and eighth graders were closer to the SDBs’ levels of mood production and selection than fifth graders, there was no discernible effect of DLI on these results. All HS groups selected the subjunctive at rates closer to the SDB in the FCT than they produced it in the EPT, but the SDB were consistent across the two tasks. At a glance, these findings suggest that HS continue to develop the subjunctive mood over time and into adolescence, and select it more than they produce it. There was no evident role of DLI in this process in these data.

**Figure 20.** Overall use of subjunctive by group on EPT and FCT.

When analyzing subjunctive use in volitional and relative clauses separately, as shown in Table 13 and Figures 21 and 22 respectively, it is possible to observe a more patterned nature of the variability in all groups’ use of the subjunctive. As reflected in
Figure 2, the SDB adults produced and selected the intensional/deontic subjunctive in volitional clauses following the verb *querer* at ceiling, with very minimal exceptions (99% of the time), as in previous research (Bookhammer, 2013; Giancaspro, 2017, 2020).

**Figure 21.** Use of intensional/deontic subjunctive in volitional clauses by group and task.

**Figure 22.** Use of polarity/epistemic subjunctive in relative clauses by group and task.
Once again, both groups of seventh and eighth grade HS showed greater amounts of use of the intensional/deontic subjunctive than the fifth grade students, although there was greater selection of the subjunctive in volitional clauses on the FCT than production in the EPT. The DLI-5 group did not have any detectible advantage over the MLS-5 group, nor did the DLI-7/8 group (see exact values in Table 13) have an advantage over the MLS-7/8 group, contra the predictions for RQ1.

All groups used considerably less subjunctive mood morphology in the nonpresuppositional relative clauses, which represents a context of the polarity subjunctive in the epistemic modal base. It is important to note that the SDB were also reluctant to produce and select the subjunctive in these contexts. This raises the possibility that the contexts under examination did not favor the subjunctive as anticipated, that subjunctive mood use is in free variation with the indicative, or that SDB were experiencing changes to their mood system with this structure, contra previous findings (Bookhammer, 2013; Giancaspro, 2017; Perez-Cortes, 2021a). One possibility is that the subjunctive in relative clauses following *buscar* is easier for speakers to recognize and produce than the lengthier matrix phrase (*no sabe si hay personas que*) in this experiment. Future research could evaluate variable quantities of production of the polarity subjunctive in relative clauses with multiple populations and multiple matrix phrases that introduce varying degrees of nonpresupposition to test this possibility.

There was also a considerable asymmetry between production and selection of subjunctive in relative clauses in the HS groups, as with volitional clauses. Furthermore, the seventh and eighth grade groups produced and selected more subjunctive morphology in relative clauses than the fifth grade groups. It should be observed that despite lower
than anticipated levels of subjunctive mood use by the SDB baseline in relative clauses, all four groups of HS used this structure below chance, particularly in production (see Table 13 and Figure 22). These findings signal differences between HS’ (and SDBs’) use of the two subjunctive contexts, as well as differences between the groups of HS and the SDB baseline. Even in the case that the stimuli did not elicit the expected mood, HS’ low levels of production, and to a lesser degree, selection, of subjunctive in relative clauses extends beyond the level of variability that SDB exhibit in their use of this structure.

**Figure 23.** Production of subjunctive by type and group on EPT.
Figure 24. Selection of subjunctive by type (volitional/relative clauses) and group on FCT.

Figure 23 shows the production of the subjunctive mood across intensional/deontic and polarity/epistemic contexts in the EPT, and Figure 24 shows the selection of mood by group across the two contexts in the FCT. The differences between the SDB and the four groups of HS children are greater in production than in the FCT (see Table 13). Based upon the descriptive findings thus far, HS’ production and selection of subjunctive mood improved with age, particularly in production, but DLI had no impact on results. In line with previous research on adult HS (Giancaspro & Sánchez, 2021; Perez-Cortes et al., 2019; Sherkina-Lieber, 2015), the children in the present study showed considerably greater knowledge of subjunctive mood on the receptive FCT than in production, but there was no imbalance across tasks for the SDB adults.

5.4.3. Frequency of Use of Spanish

However, the data discussed thus far provide insight into group-level analyses that do not consider individual-level differences in HS participants’ exposure to Spanish
outside of school. As predicted in RQ2, patterns of current language use outside of school would affect HS’ use of the subjunctive in production and interpretation, particularly in the case of the later-acquired polarity context in nonpresuppositional relative clauses. Figure 25 shows each participants’ percentages of subjunctive mood production and selection as a function of current exposure to Spanish, measured as the sum across the five contexts measured on the language questionnaire (maximum 25).

![Subjunctive by Frequency of Use](image)

**Figure 25.** Percentage of subjunctive use by HS participant as a function of frequency of use.

There appeared to be a moderate role for frequency of use in both the EPT and FCT. This trend appears stronger for the intensional/deontic subjunctive in volitional clauses, particularly in production, but to a lesser degree, in the FCT, as shown in Figures 26 and 27. However, there appears to be a minimal role for frequency of use of Spanish in HS children’s knowledge of the polarity/epistemic subjunctive in relative clauses, as reflected in Figure 27. These results are opposite the predictions for RQ1, which posited a greater role for exposure for the acquisition of the polarity subjunctive in relative clauses.
given its later acquisition than the intensional/deontic subjunctive in volitional clauses.

However, in the absence of multivariate statistics, it is not possible to interpret this effect with clarity. I return to this topic in §5.5.2.3.

Figure 26. Percentage of subjunctive use in volitional clauses by HS participant as a function of frequency of use.
Figuré 27. Percentage of subjunctive use in relative clauses by HS participant as a function of frequency of use.

5.4.4. Lexical Frequency

To this point, the descriptive data have shed light on the differences between groups and within the HS children. I now turn towards group-level analyses of lexical frequency, which allow us to glean whether some groups were more sensitive to this within-speaker effect than others. Here again, multivariate analyses are necessary to provide more meaningful insight into this variable. Figures 28 and 29 illustrate the role of lexical frequency on each group’s production of intensional/deontic subjunctive in volitional clauses and of polarity/epistemic subjunctive in relative clauses, respectively; Figures 30 and 31 reveal the impact of lexical frequency on these two contexts of subjunctive use on the FCT.

Figure 28. Percentage of subjunctive in volitional clauses by verb on EPT (organized from most to least frequent).
Figure 29. Percentage of subjunctive in relative clauses by verb on EPT (organized from most to least frequent).

Figure 30. Percentage of subjunctive in volitional clauses by verb on FCT (organized from most to least frequent).
As can be seen, there is no clear trend by group concerning the role of lexical frequency in either task, which differs from what has been documented in previous research with adult HS (Giancaspro, 2020). That is, it does not appear that HS were more likely to produce or select the subjunctive mood in either context based upon the token frequency of the twelve subordinate verbs examined averaged across the *Corpus del español* (Davies, 2016–) and the *CORPES XXI* (Real Academia Española, 2001).

It was plausible that the lack of effect could be attributed to operationalization of frequency as a continuous variable, compared to previous studies that have used categorical variables (see Giancaspro, 2020 concerning subjunctive). To entertain this possibility, Figures 32 (EPT) and 33 (FCT) show the effect of frequency in the when grouping the twelve verbs in the experimental tasks (see Table 7) into two categories: high-frequency (the most-frequent six verbs) and low-frequency (the least-frequent six verbs). The results of a two-tailed unpaired *t*-test revealed that the two groupings of verbs
was significantly different at the $p < .05$ level ($t = 4.3867, SE = 0.341, DF = 10, p = .0014$). These figures reveal minimal impact of frequency when comparing the two groups, suggesting that lexical frequency does not have a role in the present study regardless of how it is operationalized.

**Figure 32.** Effect of lexical frequency as a categorical variable by group in EPT.
5.4.5. **Summary of Descriptive Statistics**

To summarize thus far, the descriptive data, which evaluate group-level differences, revealed clear discrepancies between the SDB participants and the HS children. The seventh and eighth grade groups were closer to the SDB baseline than the fifth graders, which suggests that mastery of the subjunctive continues into the adolescent years. However, there were no differences in either task in the descriptive data between the students in the DLI program and those in the traditional monolingual school. HS children selected the subjunctive mood more frequently on the FCT than they produced it on the EPT, which supports the theory of bilinguals’ asymmetrical knowledge of syntax and morphology, as shown in recent research with adults (Giancaspro & Sánchez, 2021; Perez-Cortes et al. 2019; Sherkina-Lieber, 2015). Finally, there did not appear to be an impact of the frequency of subordinate verbs on HS’ production or selection of mood, regardless of the context of subjunctive in question. It is important to note that inferential, multivariate statistics are necessary to fully expose the influence of these variables on the use of the subjunctive mood, as these techniques are able to analyze these variables, as well as the relationships between them, beyond the group or task level. In the following section, I present these analyses and their results.

5.5. **Inferential Statistics**

5.5.1. **Data Analysis**

To address the research questions based upon the data available from the language questionnaire, proficiency measure, FCT, and EPT, it was necessary to conduct three linear mixed effects models for statistical analysis. The dependent variable for all three
models was the suppliance of subjunctive mood. A description of the method of coding of responses is described above in §5.3, which also includes information on the innovative forms that HS produced alongside the subjunctive in the relevant contexts.

Task (EPT versus FCT), group (SDB, DLI-7/8, MLS-7/8, DLI-5, MLS-5), mood (indicative versus subjunctive), and subjunctive type (intensional/deontic subjunctive in volitional clauses with the verb querer versus polarity/epistemic subjunctive in nonpresuppositional object relative clauses) formed categorical independent variables. With the exception of some recent studies (e.g., Hur et al., 2020; López Otero, 2020), research on morphology and syntax in Spanish as a HL, including on subjunctive mood, has traditionally utilized categorical variables, such as high- versus low-frequency verbs, advanced versus intermediate proficiency speakers, or simultaneous versus sequential bilinguals. As Ortega (2020, p. 25) warns, “The transformation of continuous variables into categorical ones usually throws away precious information, almost always artificially reduces variability, and often introduces imprecision and arbitrariness.” Therefore, in the present dissertation, I chose to incorporate two continuous independent variables: frequency of use of Spanish, the sum of the five Likert scales on the language questionnaire (maximum 25), and lexical frequency, the composite score generated from the standardized lemma frequencies from the two corpora (Davies, 2016–; Real Academia Española, 2001–) and as listed in Table 7.

The first linear mixed effects model was the omnibus, which analyzed HS’ use of the indicative and subjunctive across tasks. This model addressed mood (subjunctive/indicative), task, and their interaction with the data from the HS participants only. The second, the subjunctive model, evaluated group, task, and subjunctive type.
This model was necessary to address the role of DLI, age, differences between the subjunctive production and selection in volitional clauses and relative clauses, and the predicted asymmetries between mood production and selection. Group, task, and subjunctive type were fixed effects, as were all two-way interactions between them using HS’ and SDBs’ data. The third model included frequency of use, lexical frequency, and task, as well as two-way interactions between task and the other two variables, with data from HS only. Participant and item were random effects in all models.

To support the relevance of any fixed effects, nested model comparisons were calculated for each model through pairwise comparisons. An additional linear mixed methods model was conducted post-hoc after merging the DLI-5 and MLS-5 groups into a fifth grade pool and the DLI-7/8 and MLS-7/8 groups into a seventh and eighth grade pool. This was done to create a trinary grouping to address the role of chronological age more directly in HS’ production and selection of the subjunctive mood based upon the post-hoc Tukey comparisons of groups in the original model.

5.5.2. Results of Statistical Models

5.5.2.1. Omnibus Model. To further address the nature of HS’ mood systems, a generalized linear mixed effects model with HS’ data only was necessary to explore the full modal contrast in production and selection. The model contained mood use as the binary dependent variable, whereby either production or selection of the expected mood received a score of 1 and any other forms received a score of 0. The model contained fixed effects for mood (indicative versus subjunctive) and task (EPT versus FCT) and all interactions between them. To verify the goodness of fit, pairwise nested model comparisons were carried out. The pairwise comparisons revealed a main effect for the
models with structure and the structure by task interaction, as shown in Table 14, supporting the effects that emerged as significant in the omnibus model. Although the pairwise comparisons did not show an effect for task, because the model containing the interaction between mood and task was significant, it was retained in the final model.

<table>
<thead>
<tr>
<th>Model/predictor</th>
<th>#</th>
<th>$\chi^2$</th>
<th>AIC</th>
<th>BIC</th>
<th>logLik</th>
<th>Dev.</th>
<th>DF</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null</td>
<td>4</td>
<td>—</td>
<td>3247.7</td>
<td>3271.1</td>
<td>−1619.8</td>
<td>3239.7</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Subjunctive mood</td>
<td>5</td>
<td>23.280</td>
<td>3226.4</td>
<td>3255.6</td>
<td>−1608.2</td>
<td>3216.4</td>
<td>1</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>FCT task</td>
<td>6</td>
<td>0.311</td>
<td>3228.1</td>
<td>3263.2</td>
<td>−1608.0</td>
<td>3216.1</td>
<td>1</td>
<td>.5765</td>
</tr>
<tr>
<td>Mood : Task</td>
<td>7</td>
<td>28.615</td>
<td>3201.4</td>
<td>3242.4</td>
<td>−1593.7</td>
<td>3187.4</td>
<td>1</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

Table 14. Results of pairwise nested model comparisons for omnibus model.

As seen Table 15 and Figure 34, the model revealed main effects significant at the $p < .05$ level for mood, task, and the mood-task interaction; however, the effect of task cannot be considered due to the findings of the nested model comparisons.

<table>
<thead>
<tr>
<th>Fixed effect</th>
<th>$\beta$</th>
<th>CI-low</th>
<th>CI-high</th>
<th>SE</th>
<th>DF</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.8624</td>
<td>0.7755</td>
<td>0.9487</td>
<td>0.0448</td>
<td>71.7</td>
<td>19.245</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>Subjunctive mood</td>
<td>−0.4827</td>
<td>−0.5842</td>
<td>−0.3812</td>
<td>0.0525</td>
<td>43.8</td>
<td>−9.182</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>FCT task</td>
<td>−0.2244</td>
<td>−0.3337</td>
<td>−0.1150</td>
<td>0.0567</td>
<td>49.6</td>
<td>−3.953</td>
<td>.0002</td>
</tr>
<tr>
<td>Mood : Task</td>
<td>0.4421</td>
<td>0.2998</td>
<td>0.5845</td>
<td>0.0738</td>
<td>43.2</td>
<td>5.984</td>
<td>&lt; .0001</td>
</tr>
</tbody>
</table>

Table 15. Results of omnibus model.

![Summary of Omnibus Model](image_url)

**Figure 34.** Forest plot summary of omnibus model.
5.5.2.2. Subjunctive Model. In the subjunctive model, the SDB group, EPT task, and intensional/deontic subjunctive with volitional clauses were set as the baseline levels for group, task, and subjunctive context/condition, respectively. The model incorporated all data from the EPT and FCT with all participants. To verify the goodness of fit, nested model comparisons were carried out through pairwise comparisons. The nested model comparisons revealed a main effect for all pairwise models, as shown in Table 16.

Therefore, all variables were retained in the subsequent models.

<table>
<thead>
<tr>
<th>Model/predictor</th>
<th>#</th>
<th>( \chi^2 )</th>
<th>AIC</th>
<th>BIC</th>
<th>logLik</th>
<th>Dev.</th>
<th>DF</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null</td>
<td>4</td>
<td>–</td>
<td>2448.9</td>
<td>2471.6</td>
<td>–1220.4</td>
<td>2440.9</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Group</td>
<td>8</td>
<td>45.621</td>
<td>2411.2</td>
<td>2456.7</td>
<td>–1197.6</td>
<td>2395.2</td>
<td>4</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>Task</td>
<td>9</td>
<td>8.705</td>
<td>2404.5</td>
<td>2455.7</td>
<td>–1193.3</td>
<td>2386.5</td>
<td>1</td>
<td>.0031</td>
</tr>
<tr>
<td>Subjunctive condition</td>
<td>10</td>
<td>43.517</td>
<td>2363.0</td>
<td>2419.8</td>
<td>–1171.5</td>
<td>2343.0</td>
<td>1</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>Group : Task</td>
<td>14</td>
<td>26.553</td>
<td>2344.5</td>
<td>2424.0</td>
<td>–1158.2</td>
<td>2316.5</td>
<td>4</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>Group : Condition</td>
<td>18</td>
<td>26.773</td>
<td>2325.7</td>
<td>2427.9</td>
<td>–1144.9</td>
<td>2289.7</td>
<td>4</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>Task : Condition</td>
<td>19</td>
<td>5.146</td>
<td>2322.6</td>
<td>2430.5</td>
<td>–1442.3</td>
<td>2284.6</td>
<td>1</td>
<td>.0233</td>
</tr>
</tbody>
</table>

Table 16. Results of pairwise nested model comparisons for omnibus model.

As shown in Table 17 and Figure 35, there were main effects significant at the \( p < .05 \) level for all four groups and for the relative clause conditions, as well as two-way interactions between all four groups and the FCT in addition to between the DLI-7/8, DLI-5, and MLS-5 groups and the relative clause condition. Finally, there was a significant interaction between the FCT and the relative clause condition. The outputs of this model are summarized in Table 17 and visualized in Figure 35.

<table>
<thead>
<tr>
<th>Fixed effect</th>
<th>( \beta )</th>
<th>CI-low</th>
<th>CI-high</th>
<th>SE</th>
<th>DF</th>
<th>( t )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1.0071</td>
<td>0.898</td>
<td>1.115</td>
<td>0.0568</td>
<td>135.3</td>
<td>17.728</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>DLI-7/8 group</td>
<td>–0.4552</td>
<td>–0.628</td>
<td>–0.281</td>
<td>0.0899</td>
<td>131.6</td>
<td>–5.058</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>MLS-7/8 group</td>
<td>–0.4027</td>
<td>–0.545</td>
<td>–0.259</td>
<td>0.0742</td>
<td>133.3</td>
<td>–5.425</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>DLI-5 group</td>
<td>–0.6497</td>
<td>–0.799</td>
<td>–0.499</td>
<td>0.0778</td>
<td>134.7</td>
<td>–8.350</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>MLS-5 group</td>
<td>–0.6264</td>
<td>–0.770</td>
<td>–0.482</td>
<td>0.0747</td>
<td>132.0</td>
<td>–8.377</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>FCT</td>
<td>–0.0297</td>
<td>–0.111</td>
<td>0.052</td>
<td>0.0428</td>
<td>152.4</td>
<td>–0.695</td>
<td>.4879</td>
</tr>
<tr>
<td>Relative clauses</td>
<td>–0.4583</td>
<td>–0.550</td>
<td>–0.365</td>
<td>0.0482</td>
<td>110.9</td>
<td>–9.490</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>DLI-7/8 : FCT</td>
<td>0.2510</td>
<td>0.129</td>
<td>0.373</td>
<td>0.0623</td>
<td>2038.6</td>
<td>4.027</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>MLS-7/8 : FCT</td>
<td>0.1873</td>
<td>0.086</td>
<td>0.288</td>
<td>0.0514</td>
<td>2041.0</td>
<td>3.640</td>
<td>.0002</td>
</tr>
<tr>
<td>DLI-5 : FCT</td>
<td>0.2336</td>
<td>0.127</td>
<td>0.339</td>
<td>0.0541</td>
<td>2042.0</td>
<td>4.319</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>MLS-5 : FCT</td>
<td>0.2117</td>
<td>0.110</td>
<td>0.313</td>
<td>0.0518</td>
<td>2039.5</td>
<td>4.087</td>
<td>&lt; .0001</td>
</tr>
</tbody>
</table>
Table 17. Results of subjunctive mood model.

| Condition          | Estimate | Std. Error | t value | Pr(>|t|) |
|--------------------|----------|------------|---------|----------|
| DLI-7/8 : rel. clause | 0.2217   | 0.091      | 2.453   | 0.015    |
| MLS-7/8 : rel. clause | 0.1062   | -0.001     | 0.001   | 0.999    |
| DLI-5 : rel. clause | 0.2678   | 0.155      | 1.728   | 0.086    |
| MLS-5 : rel. clause | 0.1936   | 0.083      | 2.337   | 0.020    |
| FCT : rel. clause   | 0.0986   | 0.014      | 7.786   | <0.001   |

Figure 35. Forest plot summary of omnibus model.

To determine whether the five groups differed from one another in their subjunctive mood usage, I conducted post-hoc Tukey pairwise comparisons. The results of these comparisons are summarized in Table 18. The differences between the SDB baseline and three groups of HS children (DLI-5, MLS-5, MLS-7/8) were significant at the $p < .05$ level (the difference between SDB and DLI-7/8 was not significant at this level). However, there were no differences between the two fifth grade groups or the two
seventh/eighth grade groups, once again arguing against the prediction concerning DLI and students’ development.

<table>
<thead>
<tr>
<th>Contrast</th>
<th>β</th>
<th>CI-low</th>
<th>CI-high</th>
<th>SE</th>
<th>DF</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDB – DLI-7/8</td>
<td>0.218</td>
<td>-0.009</td>
<td>0.447</td>
<td>0.0820</td>
<td>91.0</td>
<td>2.668</td>
<td>.0668</td>
</tr>
<tr>
<td>SDB – MLS-7/8</td>
<td>0.256</td>
<td>0.068</td>
<td>0.444</td>
<td>0.0675</td>
<td>91.1</td>
<td>3.795</td>
<td>.0024</td>
</tr>
<tr>
<td>SDB – DLI-5</td>
<td>0.399</td>
<td>0.202</td>
<td>0.595</td>
<td>0.0706</td>
<td>91.4</td>
<td>5.654</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>SDB – MLS-5</td>
<td>0.424</td>
<td>0.235</td>
<td>0.614</td>
<td>0.0681</td>
<td>91.0</td>
<td>6.239</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>DLI-7/8 – MLS-7/8</td>
<td>0.037</td>
<td>-0.181</td>
<td>0.256</td>
<td>0.0786</td>
<td>91.3</td>
<td>0.473</td>
<td>.9896</td>
</tr>
<tr>
<td>DLI-7/8 – DLI-5</td>
<td>0.180</td>
<td>-0.046</td>
<td>0.406</td>
<td>0.0813</td>
<td>91.5</td>
<td>2.216</td>
<td>.1831</td>
</tr>
<tr>
<td>DLI-7/8 – MLS-5</td>
<td>0.206</td>
<td>-0.014</td>
<td>0.426</td>
<td>0.0792</td>
<td>91.2</td>
<td>2.603</td>
<td>.0782</td>
</tr>
<tr>
<td>MLS-7/8 – DLI-5</td>
<td>0.143</td>
<td>-0.042</td>
<td>0.328</td>
<td>0.0666</td>
<td>91.9</td>
<td>2.147</td>
<td>.2093</td>
</tr>
<tr>
<td>MLS 7/8 – MLS-5</td>
<td>0.169</td>
<td>-0.009</td>
<td>0.347</td>
<td>0.0640</td>
<td>91.4</td>
<td>2.641</td>
<td>.0714</td>
</tr>
<tr>
<td>DLI-5 – MLS-5</td>
<td>0.025</td>
<td>-0.161</td>
<td>0.213</td>
<td>0.0673</td>
<td>91.7</td>
<td>0.386</td>
<td>.9952</td>
</tr>
</tbody>
</table>

Table 18. Tukey post-hoc pairwise comparisons of groups in omnibus model.

The previous model was useful for interpreting differences between groups based on immersive HL exposure and chronological age; however, to explore the role of age more directly in the acquisition of the subjunctive mood, a separate model was prepared post-hoc. Given the lack of differences found between the DLI and monolingual school groups, and their similar proficiency in, exposure to, and use of Spanish established in §5.2, the variable of group was collapsed into three levels: SDB adults, eighth grade HS, and fifth grade HS (regardless of school). A linear mixed effects model was then run post-hoc with the three-level group factor as the fixed effect. Participant and item were retained as random effects. In this model, the SDB was set as the baseline for group. The resulting model showed a main effect for both groups, as summarized in Table 19 and visualized in Figure 36.

<table>
<thead>
<tr>
<th>Fixed effect</th>
<th>β</th>
<th>CI-low</th>
<th>CI-high</th>
<th>SE</th>
<th>DF</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.8529</td>
<td>0.7379</td>
<td>0.9678</td>
<td>0.0589</td>
<td>101.0</td>
<td>14.472</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>7th/8th grade group</td>
<td>-0.2640</td>
<td>-0.3838</td>
<td>-0.1442</td>
<td>0.0612</td>
<td>89.6</td>
<td>-4.309</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>5th grade group</td>
<td>-0.4641</td>
<td>-0.5624</td>
<td>-0.3299</td>
<td>0.0594</td>
<td>89.7</td>
<td>-7.506</td>
<td>&lt; .0001</td>
</tr>
</tbody>
</table>

Table 19. Results of refitted omnibus model with three-way group factor.
Figure 36. Forest plot summary of model for age groups.

Once again, I conducted post-hoc Tukey pairwise comparisons to explore the differences between the three groups. The results of this analysis are listed in Table 20.

The differences between all three groups were significant at the adjusted alpha level of $p < .05$, implying that the SDB used more subjunctive across tasks than the seventh and eighth grade students, who in turn did so more than the fifth grade group. These findings align with the data in the previous model, which featured a five-way categorization of group, and suggest that HS children continue to develop subjunctive mood as they get older; however, the older HS children still exhibit differences in their command of mood when compared to SDB.

<table>
<thead>
<tr>
<th>Group differential</th>
<th>$\beta$</th>
<th>CI-low</th>
<th>CI-high</th>
<th>SE</th>
<th>DF</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDB – 7th/8th grade</td>
<td>0.264</td>
<td>0.118</td>
<td>0.410</td>
<td>0.0613</td>
<td>89.7</td>
<td>4.309</td>
<td>.0001</td>
</tr>
<tr>
<td>SDB – 5th grade</td>
<td>0.446</td>
<td>0.304</td>
<td>0.588</td>
<td>0.0594</td>
<td>89.7</td>
<td>7.506</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>7th/8th grade – 5th</td>
<td>0.182</td>
<td>0.065</td>
<td>0.298</td>
<td>0.0488</td>
<td>90.1</td>
<td>3.731</td>
<td>.0010</td>
</tr>
</tbody>
</table>

Table 20. Tukey post-hoc pairwise comparisons in refitted omnibus model by age group.

5.5.2.3. Individual Variability Model. Turning now to the variables that have been shown to characterize variability within groups of HS, the third and final model
evaluated finer-grained variability within groups and individual speakers. The model included frequency of use of Spanish, lexical frequency, and task (EPT/FCT), as well as all two-way interactions between the first two variables and task, to determine if the effects of frequency of use and lexical frequency were specific to either the FCT or EPT. In this model, the EPT was set as the baseline for the task variable.

For this model, only HS’ data were incorporated. Any responses that did not include the target verb in the EPT data (e.g., use of periphrastic constructions such as \textit{ir a} + \textit{infinitive} or the use of nontarget verbs that were not mentioned in the prompt, such as \textit{hablar} in place of \textit{llamar}) were discarded, as it would not be possible to directly evaluate the role of lexical frequency if these verbs were considered. This approach to the analysis of production data concerning lexical frequency is consistent with recent research (Thane, 2023b). Therefore, 62 of 900 (6.8\%) total observations in the EPT were eliminated in which participants did not produce a response, used a nontarget verb, or produced a modal form with a verb other than those listed in Table 7. To verify the goodness of fit, nested model comparisons were carried out through pairwise comparisons, which revealed a main effect for the models with frequency of use, lexical frequency, and task as summarized in Table 21.

<table>
<thead>
<tr>
<th>Model/predictor</th>
<th>#</th>
<th>$\chi^2$</th>
<th>AIC</th>
<th>BIC</th>
<th>logLik</th>
<th>Dev.</th>
<th>DF</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null</td>
<td>4</td>
<td>—</td>
<td>2017.7</td>
<td>2039.2</td>
<td>(-1004.82)</td>
<td>2009.7</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Frequency of use</td>
<td>5</td>
<td>2.285</td>
<td>2012.4</td>
<td>2039.3</td>
<td>(-1001.18)</td>
<td>2002.4</td>
<td>1</td>
<td>.0069</td>
</tr>
<tr>
<td>Lexical frequency</td>
<td>6</td>
<td>0.084</td>
<td>2014.3</td>
<td>2046.6</td>
<td>(-1001.14)</td>
<td>2002.3</td>
<td>1</td>
<td>.7706</td>
</tr>
<tr>
<td>FCT task</td>
<td>7</td>
<td>12.274</td>
<td>2004.0</td>
<td>2014.7</td>
<td>(-995.00)</td>
<td>1990.0</td>
<td>1</td>
<td>.0004</td>
</tr>
<tr>
<td>Freq. of use : FCT</td>
<td>8</td>
<td>0.037</td>
<td>2006.0</td>
<td>2049.1</td>
<td>(-994.98)</td>
<td>1990.0</td>
<td>1</td>
<td>.8458</td>
</tr>
<tr>
<td>Lexical freq : FCT</td>
<td>9</td>
<td>0.628</td>
<td>2007.3</td>
<td>2055.8</td>
<td>(-994.67)</td>
<td>1989.3</td>
<td>1</td>
<td>.4278</td>
</tr>
</tbody>
</table>

\textit{Table 21.} Results of pairwise nested model comparisons for EPT model.
Based upon the pairwise comparisons, the final model retained frequency of use, lexical frequency, and task as predictors. In the resulting model, there were main effects for frequency of use and for task only, as summarized in Table 22 and Figure 37.

<table>
<thead>
<tr>
<th>Fixed effect</th>
<th>$\beta$</th>
<th>CI-low</th>
<th>CI-high</th>
<th>SE</th>
<th>DF</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.4040</td>
<td>0.3198</td>
<td>0.4883</td>
<td>0.0438</td>
<td>44.3</td>
<td>9.221</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Frequency of use</td>
<td>0.0728</td>
<td>0.0202</td>
<td>0.1255</td>
<td>0.0268</td>
<td>85.6</td>
<td>2.715</td>
<td>.0080</td>
</tr>
<tr>
<td>Lexical frequency</td>
<td>-0.0062</td>
<td>-0.0545</td>
<td>0.0412</td>
<td>0.0246</td>
<td>27.2</td>
<td>-0.254</td>
<td>.8012</td>
</tr>
<tr>
<td>FCT Task</td>
<td>0.1897</td>
<td>0.0929</td>
<td>0.2866</td>
<td>0.0500</td>
<td>20.7</td>
<td>3.795</td>
<td>.0010</td>
</tr>
</tbody>
</table>

**Table 22.** Results of individual variability model.

**Summary of Individual Variability Model**

**Figure 37.** Forest plot summary of individual variability model.

**5.5.3. Summary of Inferential Statistics**

To summarize, the outputs of the omnibus model reaffirm that SDB used more subjunctive than HS participants; through post-hoc comparisons, it became evident that there were differences between the fifth and seventh/eighth grade groups, but not between students in a DLI program and those in a monolingual school. Participants were more likely to use the subjunctive in volitional clauses than in relative clauses, and to select the expected mood on the FCT than to produce it on the EPT. In the analysis of
within-group and within-speaker factors, lexical frequency did not capture participants’ variability in either task; however, there was a subtle effect for frequency of use of Spanish. Therefore, the variables in the second model did not capture a large amount of variability between participants in their use of the subjunctive mood. To further explore these results, in §5.6, I turn to an analysis of individual variability for each participant.

5.6. Individual Differences

In the present section, I complement the results from the descriptive and inferential statistics with an individual analysis of participants’ production and selection tendencies. Figure 38 provides the rate of subjunctive production and selection for each HS participant, color coded by group. This figure reveals that all 75 HS children either produced or selected the subjunctive at least once, which shows that these individuals possess knowledge, albeit quantitatively and perhaps qualitatively different from that of the SDB group, of this structure. There were five participants who selected the subjunctive on the FCT in all twelve sentences; however, none of the participants produced the subjunctive in all twelve sentences.

The two participants who used the subjunctive most frequently selected it on all twelve stimuli in the FCT and produced it in eleven phrases on the EPT, therefore using the subjunctive in 23/24 instances (95.8%). One participant was from the DLI-7/8 group and the other from the DLI-5 group. The participant in the DLI-7/8 group had a BESA score of 14/14 and used Spanish at a rate of 17/25 across the five non-school contexts and 3/5 at school. The participant in the DLI-5 group had a BESA score of 7/14 and reported very infrequent use of Spanish outside of school (5/25) and no use of Spanish at school (0/5), despite participating in the DLI program.
In contrast, the participants who used the subjunctive least across tasks did so in 2/24 instances (8.3%). One participant, who was from the MLS-5 group, produced the subjunctive once on the EPT and selected it once on the FCT. The other, who was from the DLI-5 group, did not produce it on the EPT and selected it two times on the FCT. The participant from the MLS-5 group had a BESA proficiency score of 7/14 and reported using Spanish at a rate of 12/25 outside of school and 1/5 at school. The participant from the DLI-5 group had a BESA proficiency score of 7/14 and reported using Spanish at a rate of 5/25 outside of school and not at all in school, despite participating in the DLI program.

**Figure 38.** Individual subjunctive production and selection by participant and group.

Therefore, in the initial analysis of those individuals who used the subjunctive most and least frequently, there do not appear to be any common trends regarding
proficiency or use of Spanish. However, a general tendency is that those participants who selected the subjunctive more frequently on the FCT also produced it more frequently on the EPT. To determine whether or not there were specific tendencies within the four groups, Figure 39 visualizes individual results and the correlation between production and selection within each. I turn to analyses of each group in the following sections.

![Individual Rates of Subjunctive Selection and Production](image)

**Figure 39.** Correlations between subjunctive production and selection by group.

5.6.1. **Individual Group Variability**

5.6.1.1. **DLI-7/8 Group.** In the DLI-7/8 group, the eleven participants produced the subjunctive in 5.45/12 (SD = 4.45) sentences on average and selected it in 8.72/12 (SD = 3.30) sentences on average. The participant who used the subjunctive most
frequently was also one of the two in the overall analysis who used the subjunctive most, as described above in §5.6. This individual produced the subjunctive in eleven sentences and selected it categorically, for a total of 23/24 instances (95.8%). This child had a BESA score of 14/14 and a frequency of use score of 17/25 outside of school and 3/5 in school. The member of the DLI-7/8 group who used the least subjunctive selected it in four sentences and produced it three times, totaling 7/24 instances (29.1%). This participant had a BESA proficiency score of 13/14 and reported using Spanish outside of school at a rate of 10/25 and in school at a rate of 1/5. While these two participants had similar proficiency scores, the more frequent subjunctive user also used Spanish more frequently overall, both at and outside of school. This is consistent with Perez-Cortes’ (2016) findings concerning adults’ knowledge of subjunctive mood, whereby bilinguals who used Spanish more frequently than peers with similar proficiency levels also produced and recognized the subjunctive across tasks more consistently.

5.6.1.2. MLS-7/8 Group. In the MLS-7/8 group, the 23 participants produced the subjunctive in 5.39/12 (SD = 2.91) sentences on average and selected it in 8.13/12 (SD = 2.30) sentences on average. The participant who used the subjunctive most frequently produced it in ten sentences and selected it in eleven, for a total of 21/24 (87.5%) instances. This participant obtained a score of 12/14 on the BESA proficiency exam and reported using Spanish at a rate of 13/25 outside of school and 2/5 at school. In contrast, the participant with the fewest instances of subjunctive mood use selected it four times in the FCT and produced it once on the EPT, for a total of 5/24 instances (20.8%). The participant who produced the most subjunctive in the MLS-7/8 group did so slightly less frequently than the age-matched counterpart in the DLI-7/8 group, and the participant
with the lowest rate of subjunctive mood in the latter group produced and recognized this mood more than the DLI-7/8 participant with the lowest percentage. This lower degree of variability is captured in the smaller standard deviation in this group versus the DLI-7/8 students (2.30 for MLS-7/8, 3.30 for the DLI-7/8 group).

5.6.1.3. DLI-5 Group. The nineteen children in the DLI-5 group showed the widest range of overall use of subjunctive mood, as the participants who produced/selected the subjunctive the most and the least overall were both part of this group. These participants produced the subjunctive in 3.1/12 (SD = 3.53) sentences on average and selected it in 6.4 (SD = 2.72) sentences on average. As stated in §5.6, the participant who produced the subjunctive most had BESA score of 7/14 and reported very infrequent use of Spanish outside of school (5/25) and no use of Spanish at school (0/5). The participant who produced the least subjunctive obtained a score of 7/14 on the BESA proficiency measure, reported using Spanish at a rate of 5/25 outside of school, and did not use Spanish at all in school, despite participating in the DLI program, which are the same characteristics as the participant who used the subjunctive most overall. The findings that both the participant with the most and least instances of subjunctive use in this group – and in the overall dataset – had the same proficiency and frequency of use of Spanish does not align with the predictions of theories of HL acquisition reviewed throughout this dissertation. In turn, this shows that there are likely myriad other factors that contribute to HL development, even in the instance of children who receive bilingual education.

5.6.1.4. MLS-5 Group. Finally, the 21 participants in the MLS-5 group produced the subjunctive in 3.2/12 (SD = 3.22) sentences on average and selected it in 6/12 (SD =
2.60) sentences on average. The individual who used the subjunctive most frequently produced it in ten sentences and selected it in eleven, for a total of 21/24 (87.5%). This participant had a BESA proficiency score of 10/14 and reported using Spanish at a rate of 20/25 outside of school and 2/5 in school. The participant who used the subjunctive least frequently produced it in one sentence and selected it twice, for a total of 3/24 (12.5%) uses of the subjunctive in the expected contexts. This participant obtained a 7/14 on the BESA exam and reported using Spanish at a rate of 12/25 outside of school and 1/5 in school. In the following section, I summarize the findings across the individual differences analysis before turning to a more general discussion of results presented throughout this chapter.

5.6.2. Summary of Individual Variability

The results of the analysis presented throughout §5.6 have shown that there is a great deal of individual variability within each of the four groups of HS, and there were minimal observable trends across these groups. That is, while some of the participants who produced the most subjunctive in the dataset had high frequency of use and proficiency, others who showed the strongest command of mood exhibited infrequent use of Spanish and lower proficiency levels than some peers who seldom produced the subjunctive. However, a more noticeable trend, with few exceptions, is that participants generally selected the subjunctive on the FCT more than they produced it on the EPT.

Importantly, none of the 75 participants exhibited total disuse of the subjunctive in the expected contexts, which argues against incomplete acquisition of this structure. That is, the fact that each individual participant used (produced or selected) the subjunctive in at least two of the stimuli argues strongly against the altogether absence of
the mood feature from these HS’ grammars. Furthermore, because the SDB were also variable in their use of the subjunctive in relative clauses, there are instances in which some HS produced and selected the subjunctive overall more times than the comparison group. Having laid out the results of the present analysis, it is possible to turn towards a broader synthesis of the descriptive, inferential, and individual analyses before discussing their results in the context of the research questions in Chapter 6.

5.7. Chapter Summary

In this chapter, I have presented the methods of statistical analysis as well as the results of my dissertation study. First, I demonstrated that the students enrolled in the DLI school do not differ from those participants who received a monolingual education with regards to their morphosyntactic proficiency, family language exposure, or their frequency of use of Spanish outside of academic contexts. This procedure solidified the fact that the children in the two schools differed primarily in terms of their immersive exposure to Spanish at school and mitigated the likelihood that other confounding factors were at play in accounting for differences in their knowledge of subjunctive mood.

As discussed in §5.3, the HS participants were more likely to produce and select the indicative mood than the subjunctive, a contrast that was significant at the $p < .05$ level. All groups, including the SDB, showed variability in the use of the subjunctive in relative clauses – both in production and selection. While the SDB group was categorical in its production and selection of the indicative following the matrix verb *creer* (*to believe*), HS participants, particularly in the seventh and eighth grade groups, overproduced and overextended the indicative to expectedly subjunctive contexts.
The overextension of the subjunctive to subordinate clauses following the matrix verb *creer* is not consistent with previous research, although previous studies have shown that some HS appear to use the subjunctive in relative clauses that are expected to elicit indicative morphology (Giancaspro, 2019; Perez-Cortes, 2021a). In sum, although HS produced and selected the indicative more frequently than the subjunctive, an effect significant at the $p < .05$ level, there were instances of overextension of the indicative to subjunctive mood contexts, as well as subjunctive to indicative mood contexts.

Together, the descriptive and inferential statistics show that SDB adults used quantitatively more subjunctive mood than HS children, and that the seventh and eighth grade participants did so more frequently than the fifth graders. It is important to note that although the SDB were not at ceiling using the subjunctive mood in expected contexts, they showed consistent levels of subjunctive use across the EPT and FCT. In contrast, the HS generally used less subjunctive than SDB, but selected it more frequently on the FCT than they produced it on the EPT. Therefore, the SDB appear to use more subjunctive morphology than the HS children and do not show asymmetries between production and selection. In contrast, the HS show a higher amount of variability in subjunctive use as well as asymmetries between production and interpretation that the SDB do not exhibit.

There were also considerable differences across the two contexts of subjunctive use. The SDB performed at ceiling when using the subjunctive in volitional clauses. However, all groups, including the SDB, used the subjunctive in relative clauses less than anticipated. Despite the SDBs’ relative disuse of the subjunctive in nonpresuppositional relative clauses, HS used this form very infrequently, which exposes group differences between them and the adult baseline that are supported by the inferential statistics.
Finally, there was a very subtle effect for frequency of use as a continuous variable in the individual variability model. At the within-speaker level, lexical frequency did not capture HS children’s variability in their production of mood, nor did it affect selection in the FCT. This was also evident in the descriptive statistics, including when converting lexical frequency into a categorical variable.

The analysis of individual differences between participants carried out in §5.6 aligns with these findings. Although each group, particularly DLI-5, included considerable individual variability, some generalizations could be made that were consistent with the descriptive and inferential analyses. With few exceptions, participants selected the subjunctive on the FCT more frequently than they produced it on the EPT. However, in an analysis of those participants who produced and selected the subjunctive the most and least within each group, no general trends emerged. While some participants who were frequent users of the subjunctive showed high levels of proficiency in and frequency of use of Spanish, others did not, which suggests that other variables that were not incorporated into the present experiment likely shape the differences between individual HS’ knowledge of mood.

To conclude, in this chapter, I have laid out the statistical analyses that were necessary to answer the research questions using the methodologies proposed in Chapter 4. Through a detailed analyses of the data using descriptive and inferential statistics, it is now possible to answer the research questions from the previous chapter. In the following chapter, I bring together the background literature from earlier chapters and the results analyzed throughout this chapter to answer each of these questions and discuss the data with respect to the theories laid out in the first chapters of this dissertation.
CHAPTER 6: DISCUSSION OF RESULTS

6.1. Introduction

In this chapter, I connect the data analyzed in the previous chapter to the RQs from Chapter 4 and the studies on bilingualism and bilingual education surveyed throughout the first sections of this dissertation. In §6.2, I present each RQ and discuss how the data analyzed in Chapter 5 answer these questions, align (or do not align) with their predictions, and inform and compare with research from Chapters 1, 2, and 3. In §6.3, I summarize the results across the four RQs. Lastly, in §6.4, I briefly explain these findings within the multiple baselines approach that I proposed in §4.3.1. Before continuing, it is important to recognize that this chapter concentrates solely on the data obtained with respect to the four RQs and other relevant studies. I address the theoretical implications of these data both for HL acquisition and for pedagogies for bilingual education and discuss limitations in Chapter 7.

6.2. Synthesis of Research Questions

6.2.1. Research Question #1

RQ1 stated: Do HS and SDB produce similar quantities of subjunctive mood in volitional clauses (intensional/deontic subjunctive) and relative clauses (polarity/epistemic subjunctive)?

I made the following predictions for this question:

- SDB adults would produce and select the subjunctive mood more than HS children in both volitional clauses and relative clauses.
- HS would produce and select the subjunctive more frequently in volitional clauses than relative clauses.
6.2.1.1. Spanish-Dominant Bilingual Adult Results. As anticipated, the SDB adult group produced the subjunctive on the EPT and selected it on the FCT more than all four groups of HS children. This is reflected both in the descriptive statistics (see Table 13 for exact percentages and Figures 18 through 22 for visualizations) and in both of the multivariate models in this experiment. The differences are particularly evident for the intensional/deontic subjunctive in volitional clauses, in which the SDB produced subjunctive morphology in 100% of the sentences following the verb querer. This result is nearly replicated in the FCT; however, there were four instances of substitution of the indicative, likely due to error in clicking or recognizing the desired mood. These findings are consistent with previous research (e.g., Bookhammer, 2013; Giancaspro, 2017; Potowski, 2007b) that shows that bilingual adults and children raised in an environment where a non-contact variety of Spanish was spoken do not appear to experience restructuring of subjunctive mood in this syntactic context.

However, the SDB were not categorical with polarity subjunctive in nonpresuppositional object relative clauses, using it slightly above chance. The SDB in this study produced and selected the subjunctive following the matrix clause no sabe si hay personas que… in 55.8% of the expected contexts in the EPT and 62.5% on the FCT. There is mixed evidence concerning SDBs’ mood use in nonpresuppositional relative clauses in previous research: Giancaspro (2019b) and Potowski (2007b) reported that SDB adults and children, respectively, produced the subjunctive at ceiling in nonpresuppositional relative clauses, but Bookhammer (2013) reported that the SDB from multiple Spanish-speaking countries in his study used this structure in 84% of contexts. Therefore, the SDB in the present experiment used less subjunctive than in
other studies, but there has been evidence of non-categorical use previously (Bookhammer, 2013).

The data in Giancaspro (2019b) and Potowski (2007b) included the use of relative clauses following the verb *buscar* (*to look for*), a verb that appears to introduce a high degree of presupposition in the subordinate clause, as measured using controlled tasks. These studies used controlled experimental data, while Bookhammer’s data, on the other hand, were from naturalistic interviews where a broader spectrum of lexical items may have introduced a wider range of contexts in which the subjunctive is expected. In the present study, the matrix clause *no sabe si hay personas que* may not have introduced nonpresupposition to the same degree as the verb *buscar*, which in turn would reduce the likelihood of using the subjunctive with these clauses. Perhaps a similar trend would emerge upon analyzing the different verbs and phrases with which the subjunctive was used in Bookhammer’s (2013) naturalistic data, such that SDB use the subjunctive with verbs such as *buscar* but less frequently with less-common matrix phrases such as the one employed in my study. As mentioned in §5.4.2, future experimental work would be beneficial in this area to determine if different matrix phrases introduce different degrees of nonpresuppositionality in the subordinate clause, and as a result, affect rates of subjunctive mood production. To my knowledge, there is no work on this topic in Spanish.

A distinct possibility is that HS acquire an evolving mood system in relative clauses from the SDB. To test this possibility, it would be useful to incorporate a group of monolinguals, with the goal of determining if there is any degree of restructuring due to contact-induced change. If monolinguals use the subjunctive in these contexts more
frequently than SDB, this would point to the possibility that these bilinguals are experiencing changes to their mood systems. Even though incorporating a group of monolinguals would be the best way to identify restructuring of SDB adults’ modal contrasts in relative clauses, we can make some conjectures based upon the available data from this experiment.

Firstly, in the pilot group of monolingual speakers in Spain, only 1/34 produced indicative morphology, arguing against the substitution of the indicative with this particular stimulus in monolingually-raised speakers living outside of regular contact with English. To explore this question further, I plotted each participant’s percentages of use of the subjunctive in the four relative clauses in the EPT and the four in the FCT, which is shown in Figure 40. All of the SDB participants used (either produced or selected) the subjunctive in relative clauses at least once. Since the same matrix clause occurred in all eight sentences and SDB used the subjunctive at least once, the variability observed in these data cannot be due to the characteristics of the matrix clause. Figures 28 through 33, as well as the third linear mixed effects model (see Table 21 and Figure 37), did not reveal any role for lexical frequency of the subordinate verb. Therefore, this variability does not seem to be attributable to the frequency of the subordinate verb, making it difficult to find patterns in this optionality. If SDB are experiencing contact-induced change, even if it is not possible to characterize the nature of this shift with the present data, this finding aligns with the claim that structures at the syntax-pragmatics interface, such as the use of mood in contexts where it is an interpretable feature as in relative clauses, are most vulnerable to restructuring in situations of language contact (e.g., Chamorro & Sorace, 2019; Sorace, 2000; Tsimpi et al., 2004).
6.2.1.2. Heritage Speaker Children Results. It is possible to observe two key contrasts between the HS groups and the SDB: firstly, the HS were non-categorical in both of the contexts of mood studied, while the SDB were only non-categorical in one context, and secondly, HS produced the subjunctive more frequently than they selected it, unlike the SDB group (see specific percentages in Table 13). The HS children were far more likely to utilize indicative morphology or alternative structures than the SDB, who only did so in a total of four instances in volitional clauses. Therefore, the variability that HS showed in this study goes beyond the input that they have received.

Secondly, there were clear effects of context of mood on HS’ subjunctive production and selection. As shown in Table 13 and Figures 18, 21, and 22, all four HS groups produced and selected the subjunctive more frequently in the volitional clauses following the verb *querer* in volitional clauses, like the SDB, but the children used the subjunctive at lower rates in both conditions and tasks. The differences between
participants remained constant across the two age groups, but DLI-7/8 participants eventually converged on the SDB group’s rates of subjunctive selection, but not production, in relative clauses.

These findings align with past research that has shown that adult HS use more subjunctive mood in contexts of lexical selection, such as volitional clauses, than in relative clauses (Giancaspro, 2019a; Montrul & Perpiñán, 2011; van Osch et al., 2017). Aside from Potowski’s (2007b) study, which only included six items targeting the present subjunctive, in which one was a nominal complement and one was a relative clause, there is no research comparing similar structures with HS children. Potowski indeed found that more HS participants used the subjunctive in the nominal complement following the verb pedir (to ask), a context of intensional/deontic subjunctive, than in the nonpresuppositional relative clause.

However, as I will discuss at length in §7.5.5 in the following chapter, it is not possible to conclude that these effects are due to interface variability (as claimed in van Osch et al., 2017) because there is a confound between modal base and syntactic/pragmatic context in this experiment. Since monolingual children acquire the ability to distinguish between the subjunctive and indicative in relative clauses later than in volitional clauses (see findings in Ahern & Torrens, 2021; Blake, 1983; Pérez-Leroux, 1998), a possible conclusion is that sustained HL exposure is particularly necessary for HS to master the subjunctive in relative clauses, a topic that I address in RQ2 and RQ3.

6.2.1.3. Summary of Findings for Research Question #1. To conclude, the SDB used the subjunctive in volitional clauses at ceiling, while their production and selection of this mood within nonpresuppositional object relative clauses was variable. All HS
groups produced less subjunctive mood than the SDB in both contexts, suggesting that the variability that these groups exhibited was beyond the level that was present in their input. Therefore, the hypothesis that SDB would use more subjunctive than HS was supported by the descriptive and statistical analyses, as was the prediction that volitional clauses would result in higher percentages of subjunctive mood use than relative clauses. However, the difference between mood use in the two conditions emerged for the SDB participants as well, contra the predictions.

6.2.2. Research Question #2

RQ2 stated: Do exposure to Spanish through DLI and current frequency of HL use impact differences between HS in their acquisition of subjunctive mood?

For this question, I made the following predictions:

- DLI students would produce and select more subjunctive mood in both volitional and relative clauses than their peers who were educated monolingually in English.
- Children who used Spanish more frequently across non-school contexts would produce and select the subjunctive in volitional and relative clauses more frequently.
- DLI and frequency of use of Spanish would have a larger impact on HS’ production and selection of subjunctive mood in relative clauses than in volitional clauses.

6.2.2.1. Effects of Dual-Language Immersion. I first turn to results across the groups of HS, as summarized in Figures 18 through 22, and supported through the subjunctive model summarized in §5.5.2.2. There was no difference between the DLI-5 and MLS-5 groups or between the DLI-7/8 and MLS-7/8 groups that was significant at the \( p < .05 \) level in the production or selection of subjunctive mood. That is, in the present experiment, children enrolled in the DLI program did not use overall more
subjunctive mood morphology than their age-matched peers who had received an education in English only, arguing against the facilitative role of DLI in the acquisition of this particular structure. However, the DLI-7/8 group was equal to the SDB in their selection of the polarity subjunctive in relative clauses on the FCT (DLI-7/8: 62.5%, SDB: 62.5%), despite more non-subjunctive use in production (DLI-7/8: 31.7%, SDB: 55.8%).

There is, however, an interesting difference between the DLI and monolingually-educated groups in their selection of the subjunctive in relative clauses. While production rates of subjunctive in relative clauses expected to elicit this mood remained similar in the fifth grade groups (14.4% the DLI-5 group and 12.1% in the MLS-5 group), the DLI-5 students selected the subjunctive on the FCT in relative clauses in 47.5% of the expected sentences, while the MLS-5 group did so in 38.5% of these sentences. The same result carried over to the eighth grade groups. Despite a small advantage in production for the DLI-7/8 participants (31.7% versus 24.7% for the MLS-7/8 group), the DLI-7/8 group’s selection of polarity subjunctive reached 62.5%, which was the same as the SDB group. In contrast, the MLS-7/8 group selected the polarity/epistemic subjunctive in relative clauses in a total of 51% of the expected contexts. Interestingly, this trend appears to be limited to the later-acquired relative clause condition, but the advantage for immersion students is subtle, suggesting that students in DLI may have a minor advantage in the acquisition of structures that emerge during the school-aged period in monolingual children.

This finding may be due to the need for exposure to Spanish at the time when this context of mood develops in monolingual acquisition. That is, the monolingual
acquisition of the subjunctive in volitional clauses takes place before schooling begins, so it may be less impacted by exposure to the HL at school than later-acquired instances such as in relative clauses, during which time monolingually-educated HS do not have as high exposure to Spanish. If this interpretation is correct, immersion has a particularly important impact on the development of late-acquired structures that emerge after the onset of schooling.

Nevertheless, DLI did not have as clear and powerful of an impact on HL development as is generally assumed across the fields of bilingualism and bilingual education. In spite of the widespread assumption that immersion positively affects the development of academic registers of the HL, the fifth grade children who had received most or all of their primary schooling through DLI produced the subjunctive in volitional clauses in less than half of the expected contexts. Eighth graders showed considerable growth in both the DLI and non-immersion groups, but their command of mood was lower than age-matched peers from Potowski’s (2007a, 2007b) study on subjunctive acquisition in an 80/20 TWI program. In her study, 81% of participants produced the subjunctive in the intensional/deontic sentence following the verb pedir (to ask); the DLI-7/8 in this study produced it in 55.2% of the expected contexts and selected it in 77.5% of the expected contexts (see Table 13). Further, 61% of HS participants in Potowski’s study produced the subjunctive in a nonpresuppositional relative clause, while the age-matched participants in this study used the subjunctive in this context less frequently overall (31.7% in production and 62.5% in selection). Since Potowski’s experiment did not include age-matched groups of monolingually-educated children, it was not possible to extrapolate whether TWI had conferred the HS in her study an advantage in their
acquisition of mood. However, the results from the present dissertation are consistent with those cited in Potowski (2007a, 2007b) in showing that despite sustained exposure to Spanish at school, HS children do not develop this structure in a way that mirrors the SDB baseline, as in her study, a group of age-matched students dominant in Spanish used the subjunctive at ceiling.  

There are two possible reasons that the HS in Potowski’s study produced more subjunctive than those who participated in this experiment. One is that the HS in Potowski’s study had continued in an immersion program across the middle school years, while those in my experiment had transitioned to monolingual English instruction in sixth grade and had only received Spanish as a foreign language instruction since that time. Another possible reason, which is not incompatible with the first, is that the DLI program evaluated in this dissertation taught 50% of content area instruction in Spanish, while Potowski’s participants received up to 80% of their instruction in Spanish. Thus, the amount of content delivered in Spanish may have modulated the development of subjunctive mood, such that children who received more exposure to Spanish also produced more subjunctive. This aligns with theories of HL acquisition that emphasize the role of continued exposure and activation (Putnam & Sánchez, 2013).

An additional consideration is the amount of HL production in DLI programs. Potowski (2004) found that even in content areas where children in her study received

---

46 It is also important to note that Potowski’s study evaluated a variety of morphosyntactic structures, and there was only one sentence for each of the six contexts of subjunctive mood studied. It is possible that this affected the results of this study.

47 The author does not provide specific information about whether participants were excluded if they had joined the immersion program during the late elementary years, as they were in the present study.
100% of their instruction in Spanish, students interacted in English 52% of the time in their TWI program. This means that, even in a school that imposed an 80/20 model of immersion, children opted to use English for production more often than not. Given the charter school in the present study featured a 50/50 DLI program with greater overall exposure to English than the school in Potowski’s (2004, 2005, 2007a, 2007b) studies, the children may have been even more reluctant to use Spanish given the greater prevalence of English throughout their school day. This possibility seems increasingly likely in light of the format of bilingual instruction in the DLI program evaluated in this study, whereby each content area rotated weekly from Spanish to English: since students had working knowledge of academic vocabulary in each of the areas of instruction, it would have been easy for them to fall back on English when communicating with their peers and teachers during Spanish instructional blocks.48

If this is the case, these findings underscore the importance of production in HL development and maintenance, akin to Swain’s (1985, 2000) emphasis on the role of output in L2 acquisition. This would align with recent research (e.g., Goldin, 2021; Sánchez et al., 2023) that shows that levels of output predict the acquisition of morphological and syntactic structures in young Spanish HS children enrolled in TWI. If the role of output is essential for HL acquisition and maintenance, DLI programs may wish to incorporate specific content areas in one language across an entire academic year, 48

As I will address at length in the following chapter, bilingual students may benefit from using translanguaging throughout the learning process. Many researchers (see, for instance, Cenoz & Gorter, 2022; Ibarra Johnson, García, and Selzer, 2017; or Sánchez, García, & Solorza, 2018) advocate for tolerance of translanguaging, even within the framework of language separation, because it likely is necessary to leverage the acquisition of two languages.
reducing the likelihood that children simply rely on their dominant language to retrieve academic vocabulary necessary for any given content area. I return to the pedagogical implications of this study at greater length in Chapter 7.

Moreover, the findings from this dissertation are in contrast with Gathercole (2002b), who reported a positive role for a TWI program in HS children’s acquisition of grammatical gender in the elementary years. In the present study, there was a minimal impact of bilingual education on the development of the subjunctive in relative clauses, and no differences between DLI students and monolingually-educated HS in overall percentages of subjunctive use. Although development could be structure-specific, that is, DLI influences the acquisition of gender more than that of the subjunctive, a more likely conclusion is that the younger children (second and fifth grade) in Gathercole’s study benefitted more substantially from the boost in exposure during the elementary years, but that this advantage diminishes as children get older, as in the present study.

This would be consistent with Flores et al.’s (2017) findings, in which the role of exposure decreased with age: the children in their study who had less exposure to Portuguese caught up to the levels of subjunctive mood production of peers with greater exposure by early adolescence. It is unclear how much partner language instruction the participants in Gathercole’s study received, which is also a possible source of the differences between studies. However, these findings are at tension with research on L2 acquisition in immersion programs, including Hart and Harley’s (1997) study on French learners who were immersed in their target language at different times: early learners did not show an advantage over students who began immersion at a later time. Despite these findings, it is important to note that these researchers’ results do not pertain to HL
acquisition, and thus must not be interpreted as altogether contradictory with the hypothesis that immersion has a bigger impact on HL acquisition at younger ages.

Before concluding this section, it is important to address how the findings in this dissertation differ from the series of studies carried out by Kupisch and colleagues (Barton, 2015; Bianchi, 2013; Kupisch, 2012, 2014; Kupsich et al., 2014, 2016; Lein et al., 2016) and cited in Kupisch and Rothman (2018), and to postulate why these differences may emerge. While the French HS in Germany who attended a bilingual school showed strong command of multiple areas of grammar ranging from phonology to syntax, the HS in the present study in DLI did not have an advantage over their peers in monolingual schools in their knowledge of subjunctive mood. Kupisch and Rothman (2018) postulate that different conditions for bilingualism, socioeconomic status, and the stigmatization of bilingual communities could account for the reasons behind why HS may obtain different levels of proficiency in their HL in Europe and the United States.

The differences in educational and sociolinguistic experience are very evident for the two populations studied. The French HS reviewed in Kupisch and Rothman (2018) had received their secondary education predominantly in French, using a curriculum that leads to a French baccalaureate diploma. However, the lack of investment in and development of curricula for American schools that provide instruction in Spanish means that there likely is not a consistent pedagogical approach to teaching these learners, nor is there a formal diploma offered to bilingual students. Relatedly, in New Jersey, where the present study was carried out, some bilingual education certification programs do not require teacher candidates to complete specific coursework in bilingual pedagogy provided the teacher can demonstrate proficiency in a language other than English (see,
for example, The College of New Jersey, nd). Therefore, the lack of investment in specific guidelines, programs, and professional development for teachers in bilingual classrooms in the region where this study took place likely played an inestimable role in the outcomes of students’ language learning.

Furthermore, an important consideration is socioeconomic status. As reviewed throughout §4.3.2, approximately three quarters of the students in both the DLI charter school and the monolingual public school were classified as “economically disadvantaged” (New Jersey Department of Education, 2021a, 2021b). While Gathercole (2002) found no role of socioeconomic status in her findings with bilingual children, it must be noted that in general, the socioeducational circumstances surrounding the Hispanic community in the United States could be distinct when compared to children who received a private education in French in Germany. Between the lack of specific standards and curricula for DLI schools, inadequate training in bilingual pedagogies, and the possible influence of socioeconomic status, the nature of children’s learning circumstances in public American DLI schools may differ substantially from those in which Kupisch and colleagues collected data from French HS in Germany, which the researchers acknowledge likely influences acquisition. Beyond school, however, maintaining frequent use of the HL remains an important consideration, which I address in the following section.

6.2.2.2. The Role of Frequency of Use. In addition to addressing the role of education, I predicted that current frequency of use of Spanish would also affect HS children’s development of subjunctive mood. Frequency of use was established along a 25-point continuum representing five contexts of use of Spanish. As summarized in
Figures 25 through 27 and affirmed through the second statistical model and analysis of individual differences, current frequency of use had a very subtle effect on HS children’s production and selection of subjunctive mood morphology in both tasks and both conditions. Although significant at the $p < .05$ level in the second statistical model, this effect was minimal in size ($\beta = .0662$, $OR = 1.0684$). These results align with Perez-Cortes’ (2016) findings that frequency of use of the HL affected adults’ use of the subjunctive mood, although the effect in this study is slight. The subtle effect for frequency of use is consistent with recent studies on young bilingual children in a TWI program whose patterns of language output affected their command of person/number agreement morphology and null subjects in Spanish (Goldin, 2021; Sánchez et al., 2023).

These results are also consistent with Dracos and Requena’s (2022) findings, in which proficiency and patterns of exposure also accounted for participants’ variable use of the subjunctive across the three contexts evaluated (intensional/deontic nominal complement, intensional/epistemic adverbial complement, and polarity/epistemic adverbial complement). The researchers reported that the effect of exposure and use was not as robust as that of proficiency. To summarize, across their study and the data reported here, frequency of use had a slight effect on the results.

6.2.2.3. Summary of Findings for Research Question #2. In conclusion, there were no detectable differences in subjunctive mood use between the groups of HS in a DLI school (DLI-5 and DLI-7/8) and those in a traditional monolingual school (MLS-5 and MLS-7/8) in production and selection of volitional clauses and in the production of relative clauses, which goes against the predictions of RQ2. However, there was a slight advantage for the HS in the DLI program over their monolingually-educated peers in the
selection of subjunctive mood in relative clauses. The effect for frequency of use outside
of school was subtle. Therefore, despite clear differences between the SDB and the HS
children, DLI, which expectedly provides HS with more exposure to the HL, could not
account for differences between the HS, contra the hypotheses. The effect for frequency
of use of Spanish supported the predictions, but it was very small in size. However, DLI
appears to have impacted the development of the later-acquired polarity/epistemic
subjunctive in relative clauses more than the intensional/deontic subjunctive in volitional
clauses. This supports the hypothesis that late-acquired structures benefit most from HL
immersion, but the advantage of DLI in these results is minor.

6.2.3. Research Question #3

RQ3 stated: Do older HS children use more subjunctive mood than younger
children? The following predictions for this question were set forth for RQ3 in Chapter 4:

- HS in the DLI school would produce similar levels of subjunctive mood in both fifth
  and seventh and eighth grades.
- HS in the monolingual school would produce more subjunctive in seventh and eighth
  grades than in fifth grade.

6.2.3.1. Chronological Age. Recall that monolingual children appear to use the
subjunctive at ceiling in volitional clauses such as with the verb querer by approximately
five years of age (Blake, 1983; Dracos et al., 2019), and are able to attest to modal
contrasts in relative clauses by between ages six and seven (Ahern & Torrens, 2021;
Pérez-Leroux, 1998). The limited research on older bilingual children has found mixed
results for chronological age in the development of other areas of the inflectional system
in Spanish (see Corbet & Domínguez, 2020; Cuza et al., 2013; Guijarro-Fuentes &
Marinis, 2011; Guijarro-Fuentes et al., 2017; Montrul & Sánchez-Walker, 2013), and results concerning the Romance subjunctive are equally conflicting. On one hand, Dracos & Requena (2022) did not find an effect for chronological age, but note that their experiment did not have a large number of older participants; on the other, Flores et al. (2017) found that patterns of exposure interacted with age in the development of the Portuguese subjunctive mood. Therefore, the effect of age is not yet clear in HS’ development of the subjunctive mood in Spanish and Portuguese, two closely-related and typologically-comparable Romance languages.\textsuperscript{49} The present study was well-positioned to address this gap given the large number of pre-adolescent and adolescent children who participated, which is precisely the group that was lacking in number in Dracos and Requena’s (2022) study.

The results revealed that seventh and eighth grade participants produced and selected the subjunctive mood more frequently than the fifth graders who were enrolled in the same schools (see Figures 18 through 22). The DLI-5 and MLS-5 groups differed from the DLI-7/8 and MLS-7/8 groups in each of the statistical models: the seventh and eighth graders produced and selected more subjunctive in both volitional and relative clauses than the fifth graders, implying that these bilinguals experienced considerable growth in their knowledge of the subjunctive around the onset of adolescence.

6.2.3.2. Immersion and Age. As Flores et al. (2017) found, patterns of exposure and age interacted in Portuguese HS children’s acquisition of the subjunctive, likely

\textsuperscript{49} The subjunctive mood, however, is a source of microparametric difference between these languages. Jesus (2012) and Marques (2013) offer accounts of mood in European Portuguese that differs from Kempchinsky’s (2009) and Quer’s (2009) syntactic and semantic analyses.
because both contribute to the cumulative amount of HL input. Therefore, based upon the results of Flores et al. (2017), I predicted that HS in the DLI school would have cumulatively more exposure than those in monolingual schools, leading to a faster acquisition of the subjunctive mood in the contexts evaluated, such that these bilinguals would already have reached their peak development of this structure. In contrast, monolingually-educated peers might show clearer age effects similar to those bilinguals with one Portuguese-speaking parent in Flores et al. (2017) due to less exposure to Spanish. In sum, the proposed link between chronological age and exposure, defined as amount of the HL spoken at school, is based upon the interaction between these two factors that has been established in the aforementioned study.

However, there was no effect found for immersion on the impact of age, as had been predicted. That is, the immersion groups produced and selected similar quantities of subjunctive mood when compared to their age-matched monolingually-educated counterparts (see Table 13 for exact values). This finding is particularly interesting considering that the DLI-7/8 group had experienced a drop in exposure to Spanish after completing their immersion program in fifth grade, which implies that growth in knowledge of the subjunctive mood continued even in the face of a decrease in exposure to the HL. Without additional groups, such as bilinguals in third and tenth grades, it is difficult to plot the developmental trajectory of the subjunctive across the childhood and adolescent years more clearly. For this reason, subsequent studies may wish to incorporate a broader spectrum of age groups to pinpoint the impact of age on the acquisition of subjunctive mood in bilingual populations, as I discuss in §7.5.1.
HS’ development of subjunctive mood across the middle school years differs from Fortune and Tedick’s (2015) study of oral proficiency with L2L in TWI, which showed that children experienced a drop in oral proficiency between fifth and eighth grade, during which time their exposure to Spanish contracted. The DLI-7/8 participants in the present study experienced a similar drop in exposure to Spanish during the same time period, but showed stronger command of subjunctive mood three years after the immersion program concluded than they did while they were actively receiving half of their content area instruction in the HL. This is almost certainly due to the early and regular exposure that HS have to Spanish outside of school, which is not the case for L2L.

This goes against Putnam and Sánchez’s (2013) activation and reassembly approach, because in the face of a considerable decrease in exposure to Spanish, the DLI-7/8 participants showed growth in their knowledge of subjunctive in volitional and relative clauses. However, a possible alternative interpretation of these findings is that the DLI program studied here may not be providing its students with consistent exposure to Spanish, or children may respond in English considerably often given the weekly switch between languages in each content area. Given that Potowski (2004) documented that some students rely heavily on English during Spanish instructional time, and the drop in exposure to Spanish during the COVID-19 pandemic described in §4.3.2.1, this possibility seems particularly plausible. Therefore, the results point to a protracted developmental process, but immersion may not have provided HS with the anticipated level of exposure to Spanish.
To summarize thus far, it appears that HS children experience considerable growth in their knowledge of subjunctive mood between fifth grade (ages ten to eleven) and seventh or eighth grade (ages twelve to fourteen). These findings are evident in the descriptive statistics and multivariate models, which suggests that there is still room for linguistic growth in bilingual populations in the late childhood years. However, contra the predictions, it does not seem that the HS in DLI acquired the subjunctive mood faster than bilingual children in monolingual schools, despite having more exposure to Spanish. With these findings in mind, it is useful to situate these findings within the context with bilingual adolescents and on the acquisition of the subjunctive mood more generally.

6.2.3.3. Commonality with Existing Research. Firstly, it is important to consider the results of this study within the context of other work on subjunctive mood with HS. Interestingly, the HS children who participated in my experiment showed results that were quite different than Silva-Corvalán’s (2014) young grandchildren. In her study, she found that Brennan, her younger grandchild with less cumulative exposure to Spanish, had stopped producing subjunctive mood morphology by age five. The bilingual children in the present study were considerably older than Brennan, who was six at the end of data collection, yet there was a steady increase in percentages of subjunctive use from fifth to seventh and eighth grades. This is likely because the HS in this study were sequential bilinguals with more home exposure to and a greater communicative need for Spanish than Nico and Brennan. Nevertheless, a fruitful area for future research on the subjunctive would be to explore the age group between six and ten years old, which would fill in the gap between Silva-Corvalán’s and my studies and explain what transpires during this period, which is also when monolinguals meet some milestones in
the mastery of mood (e.g., the acquisition of mood contrasts in relative clauses; see Ahern & Torrens, 2021; Pérez-Leroux, 1998). I return to the need for expanding the scope of the present study to include more age groups in the limitations section (§7.5.1).

The rates of subjunctive production and selection in this study are very similar to the production of subjunctive mood with regular verbs in Giancaspro et al.’s (2022) study.\(^{50}\) Therefore, the older children in the present study exhibited use of subjunctive mood that was quantitatively similar to that of bilingual adults, most of whom were undergraduate university students at the time of testing (Giancaspro, personal communication). Given the two experiments provide similar results in terms of levels of subjunctive production (and, in the current study, of selection), it appears that, at the group level, adolescent HS children between twelve and fourteen years of age converge on the mood systems of young bilingual adults. However, preadolescent children appear not to have reached the same degree of subjunctive mood production and selection, suggesting that much development of this structure happens during the middle school years in bilingual speakers of Spanish. If this is true, it has important implications for our understanding of HL development more generally.

Specifically, if children continue to acquire the HL well beyond the period of a drop in exposure to this language around the onset of schooling, this challenges the notion of incomplete acquisition (see §1.3.1). Whether overtly or not, this theory places emphasis on the age of acquisition of the more socially-dominant language, but the

\(^{50}\) In their data, HS were more likely to produce the subjunctive with irregular verbs; however, in the present project, to control for a potential confound between frequency and regularity, only those lexical items with canonical subjunctive inflections in the first conjugation class were selected.
results of this study show that HS continue to acquire the subjunctive mood well past this time period and into adolescence. However, this theory does state that HS will often show lower levels of use of a particular structure than monolinguals or bilinguals who are dominant in the HL, which is consistent with the findings shown in this experiment.

Furthermore, many studies that have been interpreted as evidence for Putnam and Sánchez’s (2013) framework have posited that adults begin to reassemble the features of their HL over time due to decreased activation and exposure. While the evidence for this account cited throughout §1.3.3 argues convincingly that patterns of language activation play a considerable role in the evolution of HS’ grammatical systems, this does not align with the trends observed across this project and Giancaspro et al. (2022): the HS in this dissertation continue to develop knowledge of intensional subjunctive mood, such as with the verb querer, until seventh and eighth grade, and maintain a similar level of production of subjunctive mood with regular –ar verbs over time. These developmental trends do not signal a reassembly of features over time, that is, there is no (progressive decrease in use of the subjunctive), but rather imply that HS obtain – and plausibly maintain – a mood system that is qualitatively different from other populations of Spanish speakers. A related question, therefore, is how the model that Putnam and Sánchez (2013) could also be adjusted to accommodate the acquisition of functional features in the HL if these data are representative of HS’ developmental trajectory. However, it is important to recognize that these two studies provide cross-sectional data using distinct experimental tasks, so it is not possible to make definitive longitudinal claims.

Beyond the scope of subjunctive mood, comparisons of child and adult HS are uncommon in Spanish as a HL, so the present study contributes to an understudied area
of research. The finding in the present study that HS show continued development of the subjunctive into adolescence aligns with Montrul and Sánchez-Walker’s (2013) data comparing bilingual children and adults in their production of DOM morphology, in which there was a gradual increase in production of this structure into adulthood. This trend differs from the developmental trajectory of preterit morphology in Cuza et al.’s (2013) study on the acquisition of aspect morphology. In their study, children between eight and nine years of age produced more preterit morphology than children between the ages of five and seven, but adult HS’ production rates fell between these two groups. Therefore, it appeared that restructuring had ensued at later ages, possibly due to a drop in exposure (e.g., adults may no longer reside in Spanish-speaking households), implying reverse U-shaped behavior. Dracos and Requena (2022), who studied HS children’s acquisition of subjunctive, found no effect of age on development. In the light of the findings of the present study, there is as yet no consensus concerning the role of chronological age in HL acquisition during childhood and adolescence, as age effects may be structure-specific.

6.2.3.3. Summary of Findings for Research Question #3. To summarize, the results of the present study suggest that HS continue to develop knowledge of the subjunctive mood into the adolescent years. The HS in fifth grade showed lower levels of subjunctive mood use in both tasks than the seventh and eighth graders, which was evident in the descriptive and inferential statistics. This was even true for the DLI-7/8 group, who showed growth despite a notable decrease in exposure to Spanish after fifth grade. The increase in subjunctive use across age groups supports the hypothesis for RQ3; however, the effect of DLI did not modulate this effect, contra the predictions.
The finding that HS in the DLI-7/8 and MLS-7/8 groups converged on levels of subjunctive production with regular verbs in Giancaspro et al.’s (2022) study has interesting implications for our understanding of the developmental process of inflectional morphology in Spanish as a HL. On one hand, the continued growth in knowledge of subjunctive from fifth to seventh and eighth grades challenges strict interpretations of incomplete acquisition theory, as HS continue to grow after they begin to receive high levels of exposure to and activation of English. Additionally, the fact that adolescent and adult HS show consistent levels of production of mood with regular –ar verbs raises the question of whether it is appropriate to claim that HS reassemble features in their grammar as adults after prolonged periods of disuse of the HL (Putnam & Sánchez, 2013). These questions provide interesting avenues for future research on other areas of the Spanish inflectional system and with a broader spectrum of age ranges, which can help us to continue to develop theories that can accommodate the wide array of possible acquisitional outcomes in HL populations.

6.2.4. Research Question #4

RQ4 contained stated: Do lexical frequency and asymmetries between productive and receptive knowledge account for intraspeaker variability in children’s use of subjunctive mood?

I made the following predictions for this question:

- HS in monolingual schools will not be sensitive to lexical frequency in their production and selection of subjunctive mood.
- HS in monolingual schools will not show asymmetries between productive and receptive knowledge in their use of subjunctive mood.
• HS in monolingual schools will be sensitive to lexical frequency in their production and selection of subjunctive mood.

• HS in monolingual schools will show asymmetries between productive and receptive knowledge in their use of subjunctive mood.

6.2.4.1. Lexical Frequency. There has been abundant recent research on adult HS that has shown that lexical frequency affects HS’ knowledge of gender agreement (Hur et al., 2020), differential object marking (Hur, 2020, 2021), imperatives (López Otero, 2020), preterit aspect morphology with state verbs (Thane, 2023), unergativity and word order (López Otero, 2022), and, of greatest relevance to the present study, subjunctive mood (Giancaspro, 2020; Perez-Cortes, 2022). Research has shown that these effects are particularly impactful at intermediate proficiency levels (Hur, 2021; Thane, 2023) and in production (Giancaspro, 2020). The role of lexical frequency supports an activation-oriented account of HL acquisition (Putnam & Sánchez, 2013; Putnam et al., 2019) because those lexical items that are used more frequently in the memory appear to be less susceptible to the restructuring of inflectional morphology. Furthermore, although lexical frequency and overall patterns of language use must be operationalized separately (Giancaspro & Perez-Cortes, 2022), as they were in the present study, Putnam and Sánchez (2013) posit a relationship between these variables. That is, these researchers posit that decreasing language activation drives dissociations between productive and

51 In Thane (2023b), I established proficiency along a continuum, but there were very few participants who fell below the intermediate range established by Hur (2020), who used the same proficiency measure as I did (Montrul & Slabakova, 2003). Lower-proficiency participants were most susceptible to frequency effects in this study.
receptive knowledge and an increased sensitivity to the frequency of individual lexical items.

Lexical frequency has been the topic of extensive research on monolingual and bilingual L1 acquisition within the emergentist framework (Ambridge et al., 2010; Nicoladis et al., 2007; Shin, 2016). The role of lexical frequency diminishes as children grow older, reaffirming the logical assumption that this effect is temporary during the initial acquisition of morphology. Therefore, exploring the effect of lexical frequency with older bilingual children such as those in the present study held promise in allowing us to understand whether this age group was more similar to children in the development of their less-dominant language (lexical frequency decreases with age) or if they were more adult-like in their restructuring of grammar (lexical frequency increases with age and is inversely correlated with drops in HL use and exposure).

Figures 28 through 31 summarize participants’ use of subjunctive mood by verb, organized from most to least frequent. Furthermore, lexical frequency and its interaction with task were addressed in the second linear mixed effects model. The results of these analyses did not reveal an effect for lexical frequency in mood production or selection in either task or condition. Therefore, the HS children in my study did not appear to be similar to the adults in the recent body of research on this topic nor the young children in previous research on first language acquisition, given the absence of frequency effects in these data.

As addressed in §5.4.4, one possibility for the difference between the findings in this study and those in Giancaspro’s (2020), both of which considered the frequency of the subordinate verb onto which subjunctive inflections are assembled, was due to the
way in which this variable was operationalized for statistical analysis. In the present study, I addressed frequency by averaging the standardized lemmas for each verb in Table 7 across two corpora, the Davies (2016–) *Corpus del español* and the Real Academia Española (2001–) *CORPES XXI*, and utilizing this composite frequency as a continuous predictor. This is because the Davies (2016–) corpus contains substantially more tokens, but the *Real Academia Española* (2001–) corpus contains some oral data and had a sample primarily from American varieties of Spanish, which is a better reflection of input for HS (see Thane, In Press). In contrast, Giancaspro’s study grouped the verbs into two categories, high-frequency and low-frequency, based upon the ratings in the Davies (2016–) corpus only. To address this possibility, I formed categorical groupings of the most- and least-frequent six verbs in the dataset. As shown in Figures 32 and 33, the categorical grouping of verbs to measure lexical frequency did not impact HS’ use of subjunctive mood, despite differences between the two groups in this study significant at the $p > .05$ level.

If these results are representative of all HS, the resulting question is why adults and young children might be sensitive to lexical frequency while pre-adolescent and adolescent children are not. This implies reverse U-shaped behavior that is similar to Cuza et al.’s (2013) study on grammatical aspect in HS children and adults. One possibility is that lexical frequency is a useful account for the initial acquisition of mood while children continue to acquire vocabulary, but not once bilingual children’s lexical knowledge has grown substantially. Once HS reach adulthood, they may begin to restructure their morphological systems, whereby they are not able to activate the combinations of features necessary to attach mood to the least frequent lexical items. As
stated throughout this chapter, a necessary next step is to develop shorter tasks that are better suited for use with younger children and that are also administered to high school-age and adult HS participants to better determine if lexical factors are relevant across the developmental years. Unfortunately, however, the study of lexical frequency implies that each task must use a number of verbs across a spectrum of frequency, which makes these experiments longer and less conducive to administration with young children. Therefore, testing this possibility may be logistically challenging.

In summary, the present study found no role for lexical frequency in pre-adolescent and adolescent children’s use of the subjunctive mood. This was true for both conditions evaluated – volitional and relative clauses – across both tasks. Consequently, the hypothesis that children in a monolingual school would be sensitive to the lexical frequency of the subordinate verb in mood production and selection was not supported: lexical frequency did not constitute a source of intraspeaker variability in any group’s use of the subjunctive in this study. A possible reason for this finding is that HS exhibit U-shaped behavior, as discussed above.

6.2.4.2. Task Asymmetries. In contrast to the absence of lexical frequency effects, task asymmetries did capture intraspeaker variability that the HS children exhibited in their knowledge of subjunctive mood. All groups of HS – both those in DLI and those in the monolingual school – were more likely to select subjunctive mood on the FCT than to produce it in the EPT. These task asymmetries are not acquired from the SDB baseline, whose use of subjunctive mood was more balanced across the EPT and FCT, despite variability in the relative clauses condition. These findings align with a
growing number of studies that have shown that evaluating HS’ production and receptive knowledge is essential for exposing the full extent of their linguistic knowledge.

The task asymmetries in this study are consistent with research on adult HS surveyed in Chapter 1. Sherkina-Lieber (2015) found that HS overhearers of Inuktitut who reported being passive bilinguals who did not produce in their HL showed high levels of sensitivity to inflectional morphology in interpretation. Perez-Cortes (2016) built upon these findings by examining the differences between production and comprehension, and by exploring the factors that modulated the degree of asymmetry between tasks across participants. She found that adult HS were more likely to recognize the subjunctive on receptive tasks tapping the interpretation and judgment of mood morphology than they were to produce it, particularly when they reported lower patterns of use of or had lower proficiency levels in Spanish. Most recently, in their study of inalienable possession in Spanish as a HL, Giancaspro and Sánchez (2021) found that HS, particularly those with intermediate proficiency, frequently produced English-like possessive forms in place of reflexive constructions with definite determiners, yet the same participants were more likely to select the inalienable possessive form that was present in their input on the FCT. Here again, the degree of task asymmetries depended on speakers’ morphosyntactic proficiency in Spanish. These studies constitute evidence of bilingual alignments (Sánchez, 2019) because they exemplify how grammatical knowledge is malleable, and innovations can emerge in production that may or may not become representationalized at the underlying level.

The present study provides additional evidence of HS’ asymmetrical knowledge of inflectional morphology and syntax between production and comprehension by
extending these findings to pre-adolescent and adolescent children. Asymmetrical knowledge was present in all four of the HS groups, so there was no effect found of immersion on these results as had been anticipated in accordance with Putnam and Sánchez’s (2013) model. Even the DLI-7/8 and MLS-7/8 groups, whose rates of subjunctive were closest to those of the SDB, produced around 30% less subjunctive in volitional clauses than they selected it, and 31.9% less subjunctive in the EPT than the FCT in relative clauses. The finding that the polarity subjunctive was more susceptible to task asymmetries was supported by the interaction between task and condition in the omnibus model, but the effect was slight. There was no interaction between task and frequency of use of Spanish in the second multivariate model, arguing that the types of exposure evaluated do not modulate these asymmetries in the present dataset.

One possibility is that HS are still in the process of acquiring and stabilizing their mood grammars in the age range evaluated. It would be useful to compare these participants with older children to determine if the asymmetries between production and receptive knowledge decrease over time. Adult grammars are, by definition, mature; the overall increase in subjunctive mood use in the bilingual children in this study from fifth to seventh and eighth grades would suggest that pre-adolescent and adolescent children are still moving towards adult-like knowledge amidst a protracted developmental process. If this is the case, task differences in children might be part of this acquisition process, while in adults, they could be a product of reassembly of features under the performative pressures of language production, which can lead to a bilingual alignment (see Sánchez, 2019).
6.2.4.3. Summary of Findings for Research Question #4. RQ4 addressed the role of two factors – lexical frequency and asymmetries between productive and receptive knowledge – in HS children’s use of the subjunctive mood. It was hypothesized that both factors would affect those HS in a monolingual school, while they would not have an impact on individuals in the DLI program. However, the data show that there was no role for lexical frequency in the EPT or the FCT. In contrast, all four groups of HS children exhibited task asymmetries, as they were more likely to select the subjunctive on the FCT than they were to produce it on the EPT. The asymmetrical knowledge was slightly greater in the polarity/epistemic subjunctive condition in relative clauses (this effect was significant at the $p < .05$ level), but participation in a DLI program had no effect found on these results. Therefore, there was no relationship between overall exposure to the HL through type of education (DLI versus traditional monolingual schooling), which does not align with Putnam and Sánchez’s (2013) predictions that patterns of language activation drive the degree of asymmetrical knowledge between production and comprehension as well as the sensitivity to lexical frequency. It is important to recognize, however, that a reason for this finding may be due to changes in exposure due to the COVID-19 pandemic, as noted in §4.3.2.1 and §7.5.4.

6.3. General Summary of Findings

The four RQs in this dissertation addressed the differences between HS and SDB adults, the effects of immersion, current frequency of use of Spanish, and chronological age on language development, and the sources of within-speaker variability in HS children’s knowledge of subjunctive mood. RQ1 targeted differences in subjunctive mood use between the HS and SDB, as well as between the volitional clause and relative
clause conditions. RQ2 targeted the role of school and home exposure to Spanish and current frequency of HL use on HS children’s acquisition of mood. RQ3 addressed the role of age on the development of the subjunctive in bilingual children. Lastly, RQ4 investigated the role of lexical frequency and asymmetries between production and receptive knowledge as sources of intraspeaker variability.

Based upon the findings and their connections with existing bodies of research, there are some generalizations that can be made. Firstly, the SDB used more instances of subjunctive mood than HS children, but they did so quite variably in nonpresuppositional relative clauses. Secondly, DLI did not provide an advantage in HS children’s mastery of the subjunctive mood. Current frequency of use did affect HS’ knowledge of subjunctive mood, but this effect was subtle. However, participants’ use of subjunctive mood increased from fifth to seventh and eighth grade, suggesting that HL development continues into adolescence, regardless of HL exposure at school. Additionally, HS select the subjunctive more frequently on the FCT than they produce it on the EPT and are more likely to do so in volitional clauses than in relative clauses. However, there was no impact of lexical frequency in these findings.

Therefore, there are two novel contributions of the data from the present study. The first is that DLI does not appear to have an impact on Spanish-speaking children’s acquisition of their HL, at least concerning the subjunctive mood across the middle school years. Since previous studies on language development in immersion have typically compared HS with L2L and other children dominant in Spanish, it has not been possible (with the exception of Gathercole’s (2002b) study) to explore HL acquisition through the lens of different types of schooling. For this reason, the present study
provides an unexpected yet important contribution to research on this topic, showing that DLI does not appear to provide middle school-aged children with an advantage in the acquisition of subjunctive mood, a complex grammatical structure in their HL. This differs from findings summarized in Kupisch and Rothman (2018) concerning studies on French HS who attended a bilingual school in Germany.

The second primary implication of this study is that the same asymmetries between productive and receptive knowledge that are observable in recent studies on adult HS (Giancaspro & Sánchez, 2021; Perez-Cortes, 2016; Sherkina-Lieber, 2015) also affect older bilingual children. This suggests that HS children are still acquiring this structure, and recognize it on receptive tasks more than they produce it, like adults who are experiencing a degree of restructuring of mood morphology. This is juxtaposed with the findings in this study that do not show a role for lexical frequency in older HS children’s knowledge of mood, unlike adults. Before turning to a more general discussion of how these results inform HL theory and pedagogical practices in bilingual education, I explain these data using the *multiple baselines* approach advanced in §4.3.1.

6.4. Revisiting Multiple Baselines

As stated in Chapter 4, the present study had the advantage of comparing HS to a monolingually-raised baseline, but also to other groups of HS. This approach contributes to the paradigm shift in HL acquisition research (Giancaspro et al., 2022) that concentrates on differences within groups of HS, rather than solely on comparing bilinguals to other groups. Recall that the SDB served as a baseline for all participants, but each group of HS also had two additional baselines: the age-matched HS group in the opposing school, and the other age band of HS who attended the same school. Through
this grouping, I was able to separate the roles of chronological age and DLI to explore possible sources of variability within HS groups.

The two groups who attended the DLI program did not show superior knowledge of subjunctive mood when compared to age-matched baselines in the monolingual school, but the seventh and eighth grade groups showed growth compared to the fifth grade baseline groups. However, all participants used less subjunctive mood than the SDB adults. This approach to HL acquisition is important because it shifts the focus away from exclusively comparing HS to other groups of bilinguals and towards exploring the extent of variability between groups of HS that differ in characteristics such as chronological age or educational experience.

6.5. Conclusion

In this chapter, I have answered the four research questions and have discussed how the data presented herein align with existing research. In the present study, the SDB adults used the intensional/deontic subjunctive in volitional clauses at ceiling, but showed greater than expected variability in the use of the polarity/epistemic subjunctive in relative clauses. Their results were evenly distributed across the EPT and FCT, such that there was no evidence of task effects for this group. However, the variability in their use of the subjunctive in relative clauses, alongside Bookhammer’s (2013) results that also found variable use of this structure, imply that SDB may transmit an evolving mood system to HS.

Nevertheless, the mood production and selection tendencies of the four groups of HS show considerably greater variability than the SDB group. Although the HS produced and selected subjunctive mood more frequently in volitional clauses than in relative
clauses, similar to SDB, their overall rates were lower in both contexts. The HS were not
categorical in either context of mood use, but the SDB did use the intensional subjunctive
at ceiling. Therefore, all four HS groups showed optionality in both conditions, rather
than only with relative clauses. This variability was most observable in production, as HS
were more likely to select the subjunctive on the receptive FCT. There was no effect
found of lexical frequency in these results. Therefore, HS children showed greater
optionality than the SDB baseline. Asymmetries between mood production and selection,
but not lexical frequency, characterized intraspeaker variability across the HS groups.

Within the HS groups, the DLI-7/8 and MLS-7/8 produced and selected the
subjunctive in both conditions (volitional and relative clauses) more than the DLI-5 and
MLS-5 groups, but there was no difference between the immersion and non-immersion
students at either grade level. Both DLI groups selected the polarity/epistemic
subjunctive in relative clauses approximately 10% more than the non-immersion groups,
but this advantage did not carry over into production. Current frequency of use of
Spanish had a subtle impact on findings. Therefore, DLI did not provide the HS in this
study with an advantage in the acquisition of the Spanish subjunctive when compared to
monolingually-educated peers. However, HS’ knowledge and use of this structure
increased across age groups.

In the following and final chapter, I conclude this dissertation by returning to the
three goals of HL acquisition research with a discussion of how these findings can
contribute to HL acquisition theory and research in DLI education. I return to the four
theories that I presented in Chapter 1 and discuss how the data line up with each. I then
discuss that if the subjunctive is one of the structures in Spanish that requires formal
schooling, an argument for which I advocated in Chapter 2, there are opportunities for
teaching it explicitly or for building it into content area instruction in DLI classrooms. I
discuss possible strategies for teaching HL grammar in DLI programs, and also address
some of the broader implications of this study for immersion programs. It is also
important to recognize a number of limitations in this experiment, which I present before
concluding this dissertation.
CHAPTER 7: IMPLICATIONS, LIMITATIONS, AND CONCLUSION

7.1. Introduction

In Chapter 1, I presented the three motivations behind the study of HL acquisition. The first of these objectives is to document the structural differences between heritage varieties and other dialects that align with more prescriptive perspectives of grammar. The second is to explore the reasons behind the changes that cause shift in HL grammars, with the goal of elucidating the factors that can capture variability at three levels: differences between HS and other populations, differences within groups of HS, and variability within a single speaker. The third and final goal of the study of HL acquisition is to make meaningful contributions to social justice for bilingual individuals and to inform parallel fields such as bilingual education.

In Chapter 6, I addressed the first of these goals by presenting the answers to the RQs, thus informing our knowledge of child HS’ and SDBs’ use of subjunctive mood in volitional and relative contexts. In this chapter, I conclude this dissertation with a discussion of the latter of these two goals, with the objective of setting the stage for future research in the areas of HL acquisition and bilingual education that can build upon the findings of this study. In §7.2, I describe how this study contributes to understanding bilingual development in late childhood and adolescence, which has been an infrequent topic in research on Spanish as a HL. In §7.3, I return to the four theories of HL acquisition and discuss how the findings from this dissertation align with each of these frameworks. Subsequently, in §7.4, I address the implications of my study for immersion programs, with a particular focus on balancing partner language instruction with linguistically-inclusive practices such as translanguaging and the best pedagogical
practices for supporting the acquisition of structures such as the subjunctive mood.

Finally, in §7.5, I address the limitations of my study, which serve as a foundation for future research, and conclude the dissertation in §7.6.

7.2. Contributions to Research on Spanish as a Heritage Language

Research on child language acquisition is abundant, but the study of older bilingual children is far less frequent. Studying this population informs how HLs develop differently when compared to monolingual varieties, and allows us to understand if older children are adult-like, if they are similar to younger monolingual children, or if they constitute a group of bilinguals with unique characteristics of their own. Understanding this population is also important for clinicians, as it facilitates our understanding of the path of typical bilingual development with which to develop appropriate language interventions.

The present study shows that children continue to develop knowledge of the subjunctive over time, and that there is a considerable growth in speakers’ production and selection of this structure between ages ten and fourteen. These findings are similar to those obtained by Flores et al. (2017) in Portuguese, in which age and patterns of HL exposure interacted in the acquisition of subjunctive mood, and Montrul and Sánchez-Walker (2013), who found that adult Spanish HS produced more DOM morphology than bilingual children. Similarly, Cuza and Miller (2015) and Corbet and Domínguez (2020) found that older HS children showed growth in their command of the preterit/imperfect aspectual contrast. However, other projects have not found an effect for age on the development of the subjunctive (Dracos & Requena, 2022), while still others have documented attrition in adulthood after development in childhood (Cuza et al., 2013).
The results of these studies thus do not paint a clear picture of the development of inflectional morphology in children. The results in children’s development of grammatical gender and DOM are most straightforward; both Gathercole (2002) and Montrul and Potowski (2007) found that mastery of gender agreement increased with age into late childhood, and Montrul and Sánchez-Walker (2013) found a facilitative role of age when comparing children to adults in the production of DOM. However, regarding the preterit/imperfect aspectual contrast, Cuza et al. (2013) reported attrition of the preterit in adult HS compared to children ages 7-9, while Cuza and Miller (2015) and Corbet and Domínguez (2020) found age effects in their results with the same structure that show no evidence of attrition. Similarly, the results concerning the subjunctive mood are least clear of all: the present study found that age accounted for the acquisition of the Spanish subjunctive mood in volitional and relative clauses regardless of the amount of exposure to Spanish at school, while Flores et al. (2017) found that age was only impactful when considered in conjunction with patterns of exposure to Portuguese, and Dracos and Requena (2022) found no age effects in their data, mostly with children who were slightly younger than the oldest HS in this study.

Therefore, more research on a wide spectrum of age ranges and on additional structures is necessary in order to appropriately understand the path of development across the childhood years, as these studies are not yet enough in number to clearly explain the acquisitional path during this age range. In spite of the inconsistencies across these studies, what remains clear is that it is far too simplistic to compare children to adults without considering the variability within specific age ranges. The present study differs from others such as Montrul and Sánchez-Walker (2013) because it concentrates
on language development at different points in childhood at a developmental stage during which children transition towards adulthood.

The present study has the added benefit of breaking ground into our understanding of bilingualism in the late childhood years by incorporating the methods recently employed to explore variability between adult HS and within a single speaker. Until recently, frequency has not been the topic of extensive research in HL acquisition, and all experimental studies on this topic have concentrated on adult bilinguals (however, see Ambridge et al., 2010 for an extensive survey of research in L1 acquisition concerning frequency). The results show that the older children investigated in this project are similar to adults both in terms of the quantity of subjunctive mood produced (when compared to Giancaspro et al., 2022, a study with similar experimental tasks), and in terms of the quality of their mood knowledge, as all participants, including the younger fifth grade groups, selected more subjunctive on the FCT than they produced these forms. However, the pre-adolescent and adolescent HS children in this study differed both from HS adults and younger children acquiring their L1, both of whom exhibit frequency effects, as there was no influence of lexical frequency on their use of mood.

Therefore, while the present study complicates the picture concerning the role of age in childhood HL acquisition, it shows that children in late childhood and early adolescence are similar to adults in some respects such as in their asymmetrical productive and receptive knowledge of mood contrasts and overall rates of production of mood with regular verbs, but not all, as lexical frequency did not account for variability as with adult populations (Giancaspro, 2020). Future research evaluating children within a broader spectrum of age ranges is necessary, as it will allow us to chart the path of HL
development more clearly. Moreover, including additional layers of variability in the study of children’s grammar expands out knowledge of this population. In the following section, I turn to a more principled review of how this study makes contributions to theories of HL acquisition, and how the theoretical frameworks advanced in §1.3 align with (or do not align with) the data presented in the previous chapters.

7.3. Implications for Theories of Heritage Language Acquisition

In this section, I address how the data from the present study align with or differ from the predictions of the four theories surveyed throughout this dissertation. I start with incomplete acquisition and attrition, the two accounts of representational deficits that have been the most frequently-adopted frameworks in HL research. I follow with an overview of how the input quality approach can weigh in on results and comment on input quality more generally, and finish with a detailed discussion of Putnam and Sánchez’s (2013) activation approach.

7.3.1. Incomplete Acquisition

Recall that incomplete acquisition (e.g., Montrul, 2002, 2013) posits that HS’ development plateaus after the onset of acquisition of an additional language. This theory emphasizes differences between HS and monolingual speakers or bilinguals dominant in the same language in the use of inflectional and syntactic structures, such as the subjunctive mood. Generally, this approach compares HS to other populations of monolingual and bilingual speakers, which is useful for defining the nature of HLs relative to those of non-heritage varieties, but does not place emphasis on the variability within this heterogeneous group. Some studies on this topic offer insight into differences between simultaneous and sequential HS bilinguals, but this framework does not make
substantive contributions to HL acquisition beyond the between-groups level. As I argued throughout Chapter 1, addressing HS at all levels is critical to expose the intricacies of their highly-systematic grammatical knowledge, which both has theoretical consequences and a broader impact on moving away from deficit perspectives of HLs more generally.

The data from this study partially support the incomplete acquisition framework, because SDB produced and selected the subjunctive more frequently than the HS children. However, as shown in §5.6, the individual analysis of percentages of subjunctive use in the individual analyses challenge this framework because all HS showed variable use of the subjunctive mood. There were no participants who used the subjunctive in 100% of the expected contexts, nor were there any who did not either produce or select the subjunctive at least twice. The fact that HS showed variability in their knowledge of the subjunctive argues against the total absence of the subjunctive mood feature from their grammatical knowledge. This finding exposes a key caveat of incomplete acquisition theory: it is not clear within this framework exactly what makes this gradient knowledge of subjunctive mood incomplete. That is, HS appear to possess the mood feature, but they were not categorical in its use in the expected contexts in the experiment described in this study. While HS may not use mood in a way that is consistent with SDB, it is important to ask at which stage their knowledge should be deemed complete, particularly considering that the SDB were also variable in their use of the subjunctive with relative clauses.

However, many of the HS participants did not converge on the levels of subjunctive production and selection of SDB participants. If these children have reached adult-like knowledge, which appears likely considering Giancaspro et al.’s (2022) results,
then the theory of incomplete acquisition correctly predicts quantitative differences between this group’s command of mood and that of monolinguals and bilinguals who are dominant in Spanish (as in Montrul, 2009, which evaluated knowledge of tense/aspect and mood morphology in Spanish HS). Nevertheless, this theory does not make specific claims about the nature of individual variability or about the differences within groups of HS, which makes the findings concerning frequency of use and asymmetries between mood production and selection difficult to accommodate within this approach. To summarize, incomplete acquisition does not account for why HS are different from one another more generally. Moreover, any conceptualization of an incomplete grammar somehow implies the existence of a complete grammar, which is not straightforward or even possible to define empirically. In sum, incomplete acquisition is not well-positioned to account for finer grained variability in HL grammars, although the notion that HS differ from a SDB baseline is strongly supported by the present data.

7.3.2. Attrition

As reviewed throughout this dissertation, particularly in §1.3.1, traditional notions of attrition (e.g., Hicks & Domínguez, 2020; Köpke, 2007; Polinsky, 1997; 2011; 2018; Schmid & Köpke, 2017) focus on the loss and subsequent fossilization of elements of speakers’ grammars that were once productive. Attrition is challenging to study through cross-sectional research because this approach cannot capture changes in linguistic knowledge over time; however, as Montrul (2013) points out, cross-sectional studies with different age groups of participants (such as in my experiment) use a “quasi-longitudinal” approach and have the potential to expose patterns of attrition in bilingual populations.
Although it is not possible to rule out restructuring of mood in the absence of longitudinal data, there is no evidence of attrition of the subjunctive mood in the HS children’s data, considering the increase in mood use from fifth to seventh and eighth grade. When considering the similar levels of subjunctive production with regular verbs in adolescent HS from the present study and young adult HS in Giancaspro et al. (2022), it does not appear that these bilinguals restructure their knowledge of mood as they reach adulthood. Rather, barring rapid growth in and subsequent loss of subjunctive mood in late adolescence, the HS in this study showed similar production rates when compared to the young bilingual adults in Giancaspro et al. (2022). This leads to a tentative conclusion that attrition of this structure does not ensue, at least between late childhood and adulthood. Once again, study of the acquisition of inflectional morphology across a broader spectrum of age groups and grammatical structures is essential to explore this possibility, as younger children could also have shown higher percentages of production than the participants in my study (e.g., attrition took place before the fifth grade).

On the other hand, it is possible that the SDB adults were showing innovations in their mood system. However, as in the case of incomplete acquisition, attrition does not provide predictions concerning why or how language loss takes place. As alternatives, in §7.3.3, I discuss the input quality approach and its compatibility with the SDB data presented throughout Chapter 5, and in §7.3.4, I concentrate on the activation approach. These two frameworks provide more meaningful insight into the topic of changes and restructuring of HLs than traditional theories of incomplete acquisition and attrition because they concentrate on the intergenerational and within-speaker processes that lead to these changes, rather than the end result.
7.3.3. Input Quality Approach

As presented in §1.3.2, Pascual y Cabo and Rothman (2012) argue that there is evidence that HS acquire a grammar whose changes have already been set into motion by the individuals who provide them with input. Pascual y Cabo (2016, p. 34) terms this process “emerging optionality,” through which SDB begin to show variability in their grammars. For this reason, SDB are a useful point of comparison for the study of HL acquisition because they separate the effects of bilingualism and language change from what HS themselves innovate in their grammars. There is indeed evidence from Spanish in the United States that SDB exhibit subtle changes in their knowledge of morphosyntactic structures (e.g., Bookhammer, 2013; Montrul & Sánchez-Walker, 2013; Pascual y Cabo, 2013, 2016; Silva-Corvalán, 1994b).

The data reviewed throughout §5.4 show that the SDB participants in this study only produced the subjunctive in the relative clause condition in 55.8% of expected contexts and selected it in 62.5% of contexts, and that lexical frequency and production-comprehension asymmetries could not account for their variable use of mood across the controlled production and selection tasks (see §6.2.1.1). These findings somewhat align with Bookhammer’s (2013) data from semi-spontaneous oral interviews in which the baseline group produced the subjunctive in relative clauses in 84% of the expected contexts, and therefore not at ceiling, but differ sharply from Giancaspro (2019b), which incorporated a group of SDB adults, and Potowski (2007b), whose study incorporated a group of SDB children. In the latter two studies, the SDBs’ use of the subjunctive mood in nonpresuppositional relative clauses was categorical. Some of the lexical items that participants produced in Bookhammer’s (2013) study may not have been as strongly
associated with subjunctive mood in the subordinate clause as expected, which may have been the case for the matrix phrase for the relative clauses in my study. However, Giancaspro (2019b) and Potowski (2007b) both used the verb *buscar* (*to look for*) to address the subjunctive in relative clauses, and found consistent results. Nevertheless, it is unclear why the SDB in my study showed high degrees of variability when the matrix phrase was kept constant across stimuli.

This invites the possibility that HS acquire emerging optionality in the use of the subjunctive in relative clauses that is present in their input from SDB, which showcases the vitality of the input quality approach. In order to further entertain the possibility that SDB have experienced changes in their mood systems, monolingual data would be necessary. However, incorporating monolingual data, even if theoretically motivated, could have pejorative consequences for the HS data, as it would reinforce the bias towards monolingual norms. Because the central focus of the present dissertation is on HS and not on shift in SDB adults’ knowledge over time, I leave this topic to future research.

As mentioned in §5.4 and §6.2.1.2, the variability that HS exhibit in their use of the subjunctive in relative clauses goes beyond the levels of optionality observed in the SDB group. Furthermore, HS, but not SDB, show considerable asymmetries between production and selection of the subjunctive in these contexts. Therefore, regardless of the reason for SDBs’ lower than anticipated production and selection rates – whether it is due to the inadvertent inclusion of an item that does not properly trigger subjunctive mood, emergent optionality, or both – something beyond the transmission of qualitatively different input is at play in HS’ knowledge of subjunctive mood. All four groups of
children had lower percentages of subjunctive production and selection as well as asymmetrical knowledge of subjunctive mood across tasks, both of which are not reflected in the SDBs’ data.

Before concluding, it is important to recognize that there may also be other important considerations regarding input quality that move beyond Pascual y Cabo and Rothman’s (2012) framework. There are multiple factors that could interact in the quality of input that HS receive to the HL, and that have been shown to affect childhood bilingual acquisition, as Thane (2023a, p. 4, citations original) describes:

There are multiple environmental circumstances, such as travel to HL-speaking countries (Cuza & Frank, 2011), bilingual education (Gathercole, 2002), sibling order (Bridges & Hoff, 2014), number of native speakers of the HL who provide input (Unsworth et al., 2019), and number of conversational partners who provide input exclusively in the HL (Place & Hoff, 2011) that [have been shown to] influence the quantity and quality of input that HS receive.

Relatedly, many teachers in HL immersion programs are HS or L2L of the partner language themselves, and may not have received formal training in Spanish grammar. While this reveals a greater inadequacy in the preparation of bilingual teachers more generally, these individuals might constitute a considerable source of the input that HS receive. As argued above, the quality of the input that HS receive is deterministic in their acquisition of the HL, so HS in immersion schools, even those whose parents are monolingual in Spanish or SDB, may also receive exposure to qualitatively different mood systems at school. Therefore, there are many ways in which the qualitative factors of the input that HS receive can give shape to their resultant grammatical knowledge that are beyond the scope of the present study. In addition to the qualitative factors
emphasized in this approach, it is also essential to consider the quantity of exposure over time to the HL, which is the focus of §7.3.4.

7.3.4. Activation Approach

The final of theory of HL acquisition that I presented in Chapter 1 is Putnam and Sánchez’s (2013; see also Putnam et al., 2019) activation and reassembly approach that builds upon the Feature Reassembly Hypothesis (Lardiere, 1998a, 1998b, 2000, 2003, 2005, 2007, 2008, 2009) in L2 acquisition research. Their model emphasizes that patterns of use of and exposure to the HL are necessary to activate linguistic features and convert input to intake. They claim that decreases in use will lead to a gradual restructuring of the HL in a way that converges on the grammatical system of the dominant L2. The first stages of reassembly ensue with less-frequent lexical items, as they are less activated in the memory overall, and in production, which begins at the conceptual level and is more taxing than comprehension (Chater et al., 2016). At any stage of this process, HS may possess a bilingual alignment that sources grammatical features from multiple languages (Sánchez, 2019). The advantage of this framework is that it provides an account for changes over time, as well as offers specific predictions that emphasize the differences between HS and within a single speaker’s grammar during this reassembly process. Crucially, this approach posits that patterns of exposure (or lack thereof) drive asymmetrical knowledge between production and comprehension as well as sensitivity to the lexical frequency of individual lexical items. To date, most of the research within this framework has evaluated adult HS whose input in the HL has decreased considerably since living in regular contact with their HL childhood, which makes the exploration of childhood bilingualism within this framework an important next step. This also exposes
that the conclusions of these studies rest on the assumption that the feature that has been reassembled in speakers’ grammars was once productive; while the data in the present study suggest that all HS possess the mood feature, it is clear that the application of this feature was still growing in the age range that I studied.

7.3.4.1. Addressing Feature Reassembly. Within the context of the present study, the reassembly of the mood feature would imply that HS obviate the need for the subjunctive mood representation and its morphological exponents, replacing them instead with the more-frequent indicative inflections. Since English has a very limited subjunctive mood, there is no compatible feature in the English linguistic repertoire that would promote the conservation of the subjunctive in HS’ grammar. As Perez-Cortes et al. (2019) describe, in cases of more dramatic reassembly of features, HS may eliminate the need for tensed subordinate clauses and could instead produce infinitival structures with exceptional case marking, as documented by Perez-Cortes (2016) in her data and shown in §2.3.4.4 in this dissertation (61 instances of infinitives were produced in the child HS’ data). The reassembly of these features implies that HS must have already activated the mood feature and/or the necessary pragmatic correlates in the left periphery (see §2.2.2), yet the data from the present study do not point to a reassembly of these features over time, as subjunctive mood production and selection increased across age groups.

Although I argue, along with Putnam and Sánchez, that incomplete acquisition and “traditional” attrition are inadequate frameworks to account for processes of HL acquisition and change, the feature reassembly and activation approach also does not provide a neat fit for the present data. The activation approach naturally explains why HS
who receive an education in the HL would show more robust command of syntax and morphology, as they receive greater exposure to their HL. Nevertheless, there was no effect of bilingual education found, so the proposal that exposure to Spanish through DLI would impact HS’ knowledge of subjunctive mood was not supported. Furthermore, the DLI-7/8 group showed an increase in their mastery of subjunctive mood during a time when these speakers lost exposure to the HL at school, which is directly contra the predictions of this hypothesis.

This points to a potential limitation of this approach, in that it concentrates more on patterns of HL maintenance and subsequent reanalysis, rather than the initial acquisition of HLs by bilingual children. Since the HS in this study show progression in their command of mood that increases with age, there does not appear to be any reassembly of features, but rather the initial acquisition and stabilization of the mood feature continues into adolescence, which is not expected in contexts of monolingual acquisition. That is, given the growth in knowledge of subjunctive mood during this time period, regardless of the amount of exposure to Spanish at school at the group level, HS in this study did not appear to engage in a process of generating innovations to replace their mood feature over time, but rather of continuing to develop it. For this reason, the term reassembly may not be a precise account of what transpires in child HS’ grammars, particularly with complex structures such as the subjunctive whose development is also protracted in monolingual populations who have greater exposure to Spanish. Future research is needed to propose how the staged account of activation and reassembly that Putnam and Sánchez (2013; see also Perez-Cortes et al., 2019 and Putnam et al., 2019)
propose can accommodate the initial acquisition of features in the HL by bilingual children.

**7.3.4.2. Lexical Frequency.** This hypothesis also predicts that lexical frequency can capture a pattern of restructuring of inflectional morphology at the within-speaker level, but no lexical effects were observed in this study. However, the HS children in this study showed greater optionality on the EPT than in the receptive FCT. This supports previous findings that dissociate HLs’ variability in production from underlying knowledge of mood, which is described in the activation and reassembly framework. Therefore, although I found no role of lexical frequency and there was only a subtle effect for frequency of use, the activation approach correctly predicted asymmetrical knowledge of mood between production and selection in the present study.

Shin (2022) provides some early insight into the intraspeaker factors that condition Spanish HS children’s knowledge of morphology and syntax by reviewing some findings that may be useful in establishing a clearer acquisitional model for bilingual children. In line with the present dissertation, her work is firmly grounded in the principle that intraspeaker differences cannot be random (e.g., Kilgarriff, 2005); however, she does not make explicit reference to frequency in the variability she and other authors cited therein observe in HL grammars. Therefore, more work is needed with other grammatical structures and a broader age range of bilingual children in order to determine if frequency has an impact on HS’ initial acquisition of the HL, although this is methodologically challenging for reasons that I will return to in §7.5.1.

**7.3.4.2. Output.** A final consideration in research in this area is the importance of language output for HL acquisition and maintenance. Output is considered to be an
essential component of L2 development (Swain, 1985, 2000), and recent research in the context of immersion classrooms has found that the frequency with which young HS children produce in the HL affects their knowledge of morphosyntactic structures such as person/number verbal agreement and null subjects (Goldin, 2021; Sánchez et al., 2023). The present study did not measure the rate of Spanish language production on the language questionnaire, but based upon the asymmetries in which HS selected the subjunctive on the FCT more frequently than they produced it on the EPT, it is possible that the domains of language comprehension and production are not coordinated in children’s HL use. That is, research has shown that passive bilinguals are able to understand far more than they readily produce (Sherkina-Lieber, 2015), so the role of output is vital in supporting the ability to develop strong productive skills in the HL. Future research would be beneficial to determine if input and output can characterize the linguistic knowledge of HS, as exposure alone may not be sufficient for the development and maintenance of linguistic structures as complex as the Spanish subjunctive mood, even in input-rich DLI classrooms.

7.3.5. General Discussion of Theories of Heritage Language Acquisition

In light of the discussion throughout §7.3 thus far, of the four theories presented here, there are certain aspects of three (incomplete acquisition, the input quality approach, and the activation approach) that fit the current data. As stated in Chapter 1, López-Beltrán Forcada (2021, pp. 4-5) describes that “Achieving a unified theory of HL acquisition and processing requires a certain degree of common ground between all of these approaches.” HS do not appear to reach ceiling in subjunctive mood by eighth grade, and since there are no older participants in this study, it is not possible to track
development towards adulthood, and we must instead rely on data from similar studies such as Giancaspro et al. (2022) to make generalizations. Although I, along with others (Bayram et al., 2019; Giancaspro, 2017; Guijarro-Fuentes & Schmitz, 2015; Kupisch & Rothman, 2018; Otheguy, 2019; Pascual y Cabo & Rothman, 2012; Rothman & Treffers-Daller, 2014; Sánchez, 2017; Thane, 2023a), argue that the incomplete acquisition framework provides an inadequate account for fine-grained differences between HS as well as within-speaker variability, this theory correctly predicts that children still diverge from a bilingual baseline in their use of subjunctive mood up to ten years after monolingual children show stable knowledge of this structure.

The input quality approach (Pascual y Cabo & Rothman, 2012) might provide a useful framework for explaining some of the variability that HS exhibit, because there may be emerging optionality in the input to which the children in this study received exposure. In the absence of data from monolinguals with whom to compare SDB, however, the possibility that bilinguals are experiencing a change to their mood system is only supported indirectly through an analysis of variability in §6.2.1.1: since each SDB adult used the subjunctive at least once in the relative clause condition, but did not do so categorically, it is a distinct possibility that these participants are in the process of restructuring their mood system in this specific context due to high optionality in production. Regardless of the source of the variability in the SDB group, their performance cannot capture the full extent of variability in HS’ knowledge of mood, however, as HS in this study used the subjunctive less in relative clauses, nor can it account for HS’ optionality in volitional clauses given SDBs’ consistent tendencies in
this condition, so this theory at best offers only a partial explanation for the results in this dissertation.

Lastly, Putnam and Sánchez’s (2013) hypothesis correctly predicts the asymmetrical knowledge of mood that HS exhibit. Current frequency of use had a weak effect in the data, but there was no impact of lexical frequency. A possible reason that this hypothesis does not neatly fit these data is that it provides predictions for HL change, but may need to be modified to better account for initial bilingual acquisition in childhood. Specifically, the older children in this study produced and selected levels of subjunctive mood that converge on HS’ adult-like systems documented in recent similar studies such as Giancaspro et al. (2022), even when some of the bilinguals in the adolescent group had experienced a drop in exposure to their HL. This, therefore, is a promising avenue for future research that would require data from many age groups. It is also important to consider the role of language output in addition to input, understanding that HS can frequently experience dissociations between the domains of production and comprehension. Having explored the relationship between my data and the theories of HL acquisition, I turn now to the third goal of my dissertation: the discussion of pedagogical and educational implications of the results of the present study.

7.4. Implications for Teaching the Partner Language

As I have argued throughout this dissertation, the benefits of DLI extend well beyond the realm of language development. Immersion programs have powerful implications for leveling the playing field for diverse learners. As presented throughout Chapter 3, participation in TWI programs boosts grade point averages (Thomas & Collier, 2002), lowers the likelihood of high school dropout (Christian et al., 2004),
supports earlier reclassification as English proficient (Serafini et al., 2020), fosters cultural sensitivity (Bearse & de Jong, 2008), provides cognitive advantages in the realm of inhibitory control (Barbu et al., 2019; Nicolay & Poncelet, 2015; Garraffa et al., 2021), and, critically, results in higher standardized test scores that represent academic achievement and growth than in monolingual programs (Collier & Thomas, 2002; Marian et al., 2013).

However, the research literature is rife with claims that DLI provides HS with opportunities to develop high levels of proficiency in the HL through sustained L1 exposure, despite limited experimental evidence. For instance, Potowski (2007b, p. 188) states:

Heritage Spanish-speaking children benefit from dual immersion because, as they learn English, they are integrated with native English-speaking peers throughout the school day. They also continue developing their Spanish proficiency, particularly more formal registers, an opportunity not offered by the vast majority of United States elementary schools.

Lindholm-Leary and Genesee (2014) share the belief that immersion education confers an advantage for HS children. They claim (p. 169) that “Students [in immersion] are able to achieve at grade level in their academic subjects, attain the same level of proficiency in their L1, and acquire advanced levels of functional proficiency in the additional languages.” However, only Gathercole’s (2002b) study has compared HL development in children enrolled in TWI and traditional schools; as stated in §3.3.3, it is the very lack of research comparing groups of children with different contexts of HL exposure at school that underscores the prevalence of this assumption.

In the next sections, I discuss implications of the data from my experiment on the broader issues in immersion education, such as language planning and policy, teacher
preparation, the creation of content and language learning objectives, and balancing language exposure in a way that also supports children’s multilingual repertoires.

Subsequently, I talk about how there are some existing pedagogical practices that appear to be beneficial for HS in their development of the HL that may be useful for immersion teachers. I argue that it is important to exploit the opportunity to provide academic instruction in Spanish in DLI programs through the use of explicit language teaching and the implementation of biliteracy strategies that better support the development of both of bilingual children’s languages, with the goal of creating pedagogical frameworks that push HS towards high levels of academic competence and literacy in both of their two languages.

7.3.1. Implications for Bilingual Education Policy

The findings that HS children in DLI programs do not automatically develop discernibly higher command of complex linguistic structures than monolingually-educated peers (aside from a very subtle advantage in their command of the subjunctive in relative clauses) has many implications for policies surrounding bilingual education more generally. The absence of differences between these groups should not be interpreted as an argument against immersion programs, but rather signal the need for an innovative research agenda that can set the stage for advances in educational policies for multilingual students and for the implementation of effective pedagogies for teaching bilingual learners.

7.3.1.1. Concentration of Partner Language Instruction. Firstly, the comparison of HS children’s rates of subjunctive production and selection in the present study with those in Potowski’s (2007b) project reported in §2.3.3 and §3.5.2.3 invite the
interpretation that quantity of partner language instruction matters in acquisitional outcomes. This is consistent with Lindholm-Leary’s (2001) and Christian et al.’s (2004) findings that HS in 90/10 TWI programs demonstrated higher performance on measures of Spanish language proficiency than students in 50/50 TWI programs, at no cost to their English language development. Therefore, it may be that the linguistic benefits of immersion only emerge when high concentrations of the partner language are integrated into instruction. There is a need for experimental linguistic research on comparing HL students in 50/50 and 90/10 immersion programs, as currently, it is only possible to make indirect comparisons across these two studies. However, given there is no lasting difference in English language development in 90/10 programs, increasing partner language instruction would likely have a positive impact on the acquisition of both languages that may not be as evidence in 50/50 programs.

7.3.1.2. Teacher Preparation and Language Proficiency. One consequence of greater partner language instruction is the need for a greater number of bilingual teachers. Therefore, advocating for a more immersive experience for HL learners comes with incentivizing the study of bilingual education at the university level more generally. In so doing, we also must support teachers in developing high levels of academic proficiency in two languages. Many bilingual teachers are HS of the partner language themselves, which gives them a natural advantage in working with multilingual and multicultural learners; however, these individuals likely have very similar linguistic experiences to the children they are teaching, and they may also transmit a qualitatively different linguistic system to these students. Consequently, bilingual teachers should also receive training on the structure of the two languages of instruction, as well as on the best techniques for
teaching grammar to children. To summarize, the establishment of a greater percentage of partner language instruction entails expanding teacher preparation programs that provide adequate technical training and that support the acquisition of academic language proficiency. One method through which teachers can use this knowledge is by crafting language learning objectives that they integrate into their content area lessons.

7.3.1.3. Language Learning Objectives and Explicit Instruction. An additional consideration in the development of DLI programs is for educators to develop specific language learning objectives in their content area instruction. There is adequate linguistic research on Spanish as a HL, such as the studies reviewed throughout this dissertation, that can be used to determine which areas of the partner language are most challenging for HS to acquire. Knowledge of areas of difficulty for HL learners is particularly useful in determining which linguistic structures need reinforcement through content area and direct HL instruction. Teachers and administrators would be well-advised to develop specific language learning objectives for their lessons and to craft content area activities around these objectives. Doing so facilitates HL development within a meaningful academic context while simultaneously working towards a specific linguistic goal.

As discussed in Chapter 2, the subjunctive mood is particularly difficult for bilingual children to acquire. Considering that the monolingual acquisition of this structure spans into pre-adolescence (Dracos et al., 2019) or even adolescence (Blake, 1983), it may require formal exposure at school to reach the adult-like system. Such structures epitomize Hulstijn’s (2011) higher language cognition. In these instances, explicit instruction may be necessary to complement language learning through the content areas. If this is the case, there are two implications for immersion programs. The
first relates to the implementation of language arts instruction in both languages across the primary years, rather than concentrating exclusively on the development of English. The second concerns how best to support language development through direct instruction, which leads to a broader debate about how immersion programs are structured and the ways in which languages are divided. In the following section, I turn towards this debate and discuss how this study might contribute to this topic.

7.3.2. The Language Use Debate

Another critical topic in immersion education surrounds how to balance the goal of using the partner language with practices that are maximally inclusive of bilingual children’s holistic linguistic talents. An imperative first step in the establishment of a pedagogical approach to teaching bilingual learners centers around an important debate in the research literature concerning language separation. On one hand, linguistic theory posits that there is a linear relationship between exposure to a language and the development of competence in it. To this effect, previously-cited studies (Christian et al., 2004; Lindholm-Leary, 2001) have shown that bilingual children who receive more Spanish exposure at school show stronger knowledge of the HL as measured using proficiency tests. The salient message from studies such as these is that maximizing the opportunities for using Spanish and separating the languages across the curriculum facilitates HL development. García (2009) describes this philosophy as a *monoglossic* approach that conceives of bilingualism as the sum of two monolingual grammars, without taking into consideration that named languages are socially constructed and do not reflect the dynamic nature of bilingual competence. Research has shown that many current and preservice teachers share this perspective, and believe that language
separation is a prerequisite for successful bilingual development (Haukås, 2016; Portolés & Martí, 2020).

More recent research on bilingual children may appear to be in tension with this approach. As an alternative to the monoglossic approach, García (2009) advocates for translanguaging, through which multilingual children are encouraged to rely on their entire linguistic repertoire as a fluid and dynamic resource that does not separate itself into rigidly-defined languages. Following García and colleagues, translanguaging is not only a pedagogical tool, but also a vehicle for challenging structures of power (e.g., Sánchez & García, 2022; Wei & García, 2021). Integrating translanguaging into teaching practices has been shown to increase students’ language learning confidence (Prada, 2019; Santos et al., 2017) and to have a positive impact on linguistic identities (Tian, 2022). Within the context of bilingual education, Cenoz and Gorter (2022) argue in favor of pedagogical translanguaging. Cenoz (2017, p. 194) defines this practice as “Planned by the teacher inside the classroom and can refer to the use of different languages for input and output or to other planned strategies based on the use of students’ resources from the whole linguistic repertoire.”

Balancing input in the partner language and providing flexible language use policies for students is a challenge, because strict interpretations of each side of this debate appear to be juxtaposed with one another. However, educational scholars have begun to explore how to balance exposure to the partner language with tolerance of children’s full linguistic repertoires. For instance, Ibarra Johnson et al. (2019) argue that separation of language use by content area is not problematic so long as there are spaces and supports in the learning process through which children can connect their learning
across multiple languages. Moreover, Sánchez et al. (2018) describe that translanguaging is a scaffolding tool that leverages the development of both languages through the appropriate supports in each language for each student. Where necessary, teachers may opt to use whatever tools are available to the learner (regardless of language) to facilitate development in English and/or the partner language.

The results of the present study show that the amount of exposure to Spanish at school did not result in an advantage in the use of the subjunctive when compared to age-matched HS peers in a monolingual school. Therefore, a greater use of Spanish may be desirable wherever possible, but there are likely still opportunities for translanguaging. For instance, teachers may wish to adhere to language divisions across the content areas (that is, teaching a specific content area in one language and others in another) while designing specific activities that require that students engage with both of their languages. As an alternative, students should have times where they are encouraged to translanguagene actively as a way of learning about their full linguistic repertoires, while still providing spaces where students can maximize their use of the HL for academic purposes to fortify its development.

These approaches to bilingual education can also be tested through experimental research by comparing the proficiency levels and linguistic knowledge of children who receive immersion instruction through strictly-enforced separation of languages and those who receive instruction that adheres to the premises of pedagogical translanguaging. In the subsequent section, I present two possible strategies for the explicit instruction of structures such as subjunctive mood morphology that are or can be adjusted to be tolerant
of translanguaging practices, can occur during content area instruction, and are amenable to experiments that test their effectiveness.

7.3.3. Pedagogies for Teaching Spanish as a Heritage Language in K-12 Settings

What the data from the present experiment suggest is that exposure to the HL at school may be a necessary but insufficient condition for the development of bilingualism and biliteracy, and that additional pedagogical supports are necessary to most fruitfully capitalize on the opportunities that immersion programs present for HS and L2L. These findings also support Flores and García’s (2017) claim that bilingual education is not a panacea that resolves all academic and linguistic challenges that are systemically leveled at bilingual children, and underscore the need for appropriate pedagogies that provide bilingual students with instruction in both languages. Even though this dissertation draws theories and methodologies from bilingualism research, its results also have potential to contribute to teaching practices in bilingual classrooms.

As stated in §3.6.2, Harley (1993) argues that DLI programs should take advantage of a balance of experiential and analytical approaches for teaching the partner language. For HS, this means receiving explicit exposure to the HL across the content areas, as well as analytical instruction, which targets the development of explicit awareness of specific structures of the HL. Harley further posits the compensatory salience principle, which emphasizes the importance of form-focused instruction in cases where specific structures have low communicative weight or are difficult to perceive. Since the subjunctive has a subtle vocalic contrast when compared to the indicative and its use in intensional contexts such as volitional clauses does not contribute novel information to the utterance, the subjunctive is a logical target of explicit instruction.
in DLI classrooms. This is especially true given its low perceptual salience and communicative value, late timing in monolingual and bilingual acquisition, and variable use in HS populations, as argued in Chapter 2.

Needless to say, there are many ways through which it is possible to approach explicit instruction in DLI programs. The creation of pedagogical practices for bilingual education is a far-reaching challenge that requires the establishment of research-based assessments (Thane et al., 2022), language and learning standards for bilingual programs, increasing educators’ understanding of bilingual development more generally, and boosting teachers’ partner language proficiency. Subsequently, the development of coursework in teacher preparation programs and professional development for existing bilingual teachers is pivotal to the success of these pedagogies in the future. There is little research on culturally-responsive and linguistically impactful pedagogies for teaching grammar in DLI, which is an important next step for the field.

As I argued in Chapter 2, the development of the Spanish subjunctive may require some degree of direct instruction, as it aligns with a structure that Hulstijn (2011) proposes is part of higher language competence. Given the findings that monolingual speakers with higher levels of educational attainment also show more sensitivity to complex linguistic structures in English, such as the passive voice (e.g., Dąbrowska, 2006), increased exposure to the HL itself may not guarantee that these structures develop in the way predicted by linguistic theory. Following the argument in §2.4 that the Spanish subjunctive is one such structure, it may be necessary to incorporate explicit instruction on it in DLI programs, especially considering the lower levels of exposure to the HL than in contexts of monolingual L1 acquisition. Direct instruction can occur
during content area lessons (e.g., grammar explanations are built into relevant activities) or during dedicated language arts classes.

Only recently has experimental research on instructed HL acquisition gained attention (see Bowles, 2022 for recent studies exploring the teaching of HLs), but at the university level. At the K-12 level, instruction should concentrate on supporting the acquisition of the partner language while maximizing participants’ holistic language repertoires through pedagogical translanguaging practices. Furthermore, instructional techniques need to engage younger learners and should be brief due to children’s limited attention spans. There are two possible strategies that may prove fruitful in this area, and future experimental research is possible to determine if they yield favorable learning outcomes.

7.3.3.1. Teaching for Biliteracy. A program developed for teaching biliteracy skills in bilingual classrooms stems from a pedagogical approach known as teaching for biliteracy (Urow & Beeman, 2012). The central tenet of this approach is building bridges between each of a bilingual’s two languages through guided metalinguistic instruction. In this approach, teachers develop language learning objectives across the content areas and carry out inductive, group-focused contrastive analysis with their students about specific aspects of grammar during their content learning. The goals of these activities are twofold: firstly, they support the development of one language by relying on knowledge of the other, and secondly, they build students’ metalinguistic awareness and train them to be independent language learners.

This pedagogical approach emphasizes that schools must generate a language allocation policy through which bilingual teachers carefully structure their use of each
language across the content areas. The creation of this plan requires selecting which language will be the medium of instruction across each content area and grade. Once the bilingual program has reached a consensus about the characteristics of language use, teaching for biliteracy calls for a three-stage process to engage children in actively learning about their two languages. In the first stage, teachers provide content area instruction in one language, which should be consistent with the language specified in the allocation policy. The second phase of teaching for biliteracy is the bridge itself, whereby teachers build contrastive analysis into their lessons to draw students’ attention to the characteristics of the two languages of instruction. Finally, children engage in production activities in the other language, which fortifies the connections between content taught in each and pushes students towards the development of two languages. In these instances, the teacher maintains faithful separation of the two languages of instruction. In this way, the bridge serves as the transition between languages; however, Beeman and Urow emphasize that children may engage in bridging, or translanguaging, freely, which encourages them to use the language in which they are most comfortable to seek clarification, work with peers, and engage in the learning process overall.

Since teaching for biliteracy requires the use of two languages, building bridges in turn calls upon students to use their full linguistic repertoire with the goal of strengthening one or both of them. Although teachers’ language use is planned strategically, Beeman and Urow emphasize that children may informally translanguage routinely during any part of bilingual instruction, that is, before, during, or after building bridges during the contrastive analysis session. This approach aligns maximally with pedagogical translanguaging because, as Cenoz and Gorter (2022, p. 343) describe:
“Isolating languages creates a cognitive problem in the learning process because it excludes the possibility of benefitting from prior knowledge. Learning can be enhanced by using the knowledge that learners already have as a starting point which can then be linked to new knowledge.”

To my knowledge, the effectiveness of teaching for biliteracy has not yet been the subject of empirical research, although these strategies were designed specifically for bilingual classrooms. However, there is evidence from two studies that translanguaging can facilitate metalinguistic awareness in bilingual children in a way that cannot be achieved through traditional monolingual instruction. In the first study, Leonet et al. (2020) found that fifth and sixth grade children in a trilingual school who received instruction about the similarities and differences in suffix formation across their three languages outperformed a control group on a test of morphological productivity, and reported that the use of their home languages – Basque and Spanish – was useful in supporting the development of English, their third language.

In the second relevant study, Lyster et al. (2013) carried out a comparable study in which they administered morphological awareness training to a subset of English-French bilingual children in an immersion school located in a region of Canada where English was the superordinate language. The researchers found that children who received the intervention gained morphological awareness skills in French, the non-dominant L2, from pre-test to post-test, while those who did not receive the intervention made no growth. English-dominant children also showed growth in morphological awareness on the English morphology test. These findings were not replicated in children’s knowledge of derivational morphology in English, the dominant language, suggesting that morphological awareness training is more impactful in the partner language.
Since Leonet et al. (2020) and Lyster et al. (2013) primarily studied L2 learners of English and French, respectively, it is particularly important to consider the French-dominant group in the latter study. Young French-dominant children did show growth in their awareness of French derivational morphology, even though their growth did not extend to the English-speaking task in their L2. Since French was the less-spoken language in the region where the school is located, this suggests that this pedagogical approach was effective for these bilinguals, who may become HS of French living in an English-dominant community after continuous exposure to English. Applying these findings to a broader context, if students who receive teaching for biliteracy instruction that focuses on contrastive analysis, as in the present study, show superior growth in their knowledge of HL grammar when compared to peers who did not, this result would support the use of this technique in immersion schools. More importantly, it has the potential to showcase the effectiveness of translanguaging on the acquisition of two languages. In the following section, I review an additional approach focused on research in language processing that has received a great amount of research in instructed L2 acquisition that holds promise in teaching grammar to HS.

7.3.3.2. Processing Instruction. One of the most researched areas of instructed second language acquisition has concentrated on Processing Instruction (PI), which builds upon theories of input processing (e.g., VanPatten, 1996, 2002, 2004, 2015). This approach to language teaching emphasizes explicit instruction prior to carefully-prepared, meaning-focused activities that provide structured input to students. These activities are situated within a meaningful context that requires that learners attend to a predetermined linguistic structure, which trains them to process input in a way leads to the acquisition of
the structure in question.\textsuperscript{52} Learners must be actively engaged in these tasks and should demonstrate understanding of oral and spoken input through simple comprehension tasks. For children, these tasks must be engaging and interactive, but through careful planning, it is possible to push children’s attention towards the relevant linguistic structure for the purposes of completing a broader and meaning-oriented task. In this instance, PI must strictly incorporate the HL into instruction; however, students may still be encouraged to use their whole linguistic repertoire during the comprehension activities to ask questions or seek clarification.

Research on PI has been prevalent in L2 acquisition research for three decades. This approach is effective in improving both comprehension and production (VanPatten & Cadierno, 1993; VanPatten & Wong, 2004), with child and adult L2 learners (Benati & Lee, 2008), through in-person and computerized delivery (Aguilar-Sánchez & McNulty, 2007), and over prolonged periods (Arroyo-Hernández, 2007; VanPatten & Fernández, 2014). There is research that suggests that Spanish L2L benefit from PI in learning word order (VanPatten & Cadierno, 1993), past tense (Cadierno, 1995), preterit/imperfect aspect (Aguilar-Sánchez & McNulty, 2007), direct object clitics (Keating & Farley, 2008), and, most relevantly, subjunctive mood (Collentine, 1998, 2002; Farley, 2001a, 2001b; Kirk, 2013). Recently, PI has also proven to be effective in teaching the subjunctive to adult Spanish HS as well (Fernández-Cuena & Bowles, 2021; Potowski et al., 2009).

\textsuperscript{52} This is a very rudimentary introduction to the principles of PI. Readers should review Benati (2019) for a recent survey of research on PI and VanPatten (1996, 2004) for a more extensive theoretical foundation in input processing.
Since research has shown that PI is an effective tool for HL learners and for children, it may be a useful methodology for teaching difficult morphosyntactic structures in Spanish immersion programs. Since the structured input activities that follow explicit instruction focus on meaning, they can be adapted and integrated into content area instruction. That is, teachers can build activities around teaching grade-appropriate concepts in the partner language while also focusing more directly on language development. It is possible that teachers can carry out explicit instruction in both languages and can encourage children to respond to these comprehension activities in whatever language(s) in which they are comfortable to favor the use of translanguaging. Teachers can also build teaching for biliteracy into this approach by carrying out contrastive analysis during explicit instruction. While explicit instruction may not be feasible for young bilingual children, the students in the present experiment are certainly capable of completing structured input activities and working through collaborative grammar explanations. In sum, PI holds promise in teaching areas of inflectional morphology such as the subjunctive mood within content area lessons, which makes it maximally useful for bilingual upper elementary and middle school populations.

7.3.3.3. Summary. Teaching for biliteracy and PI emphasize the role of explicit instruction in the HL, with the goal of supporting children’s development of both languages. These strategies have the potential to build HS’ proficiency in the partner language by simultaneously embracing both. For this reason, they balance the need to

53 These practices may not work under traditional frameworks of PI that were developed for L2L with limited proficiency, but can be adjusted to fit the needs of HL learners who already have had exposure to the language in question. Future research on this topic is necessary to determine whether adjustments to the L2-oriented framework of PI may better suit HL learners.
support the acquisition of the HL in specific content areas while also encompassing pedagogical translinguaging, which allows them to adequately address the needs of multilingual learners. These strategies may be effective specifically for teaching grammatical structures such as the subjunctive mood. These topics are areas open to future research. There are also some limitations of this study that future research may wish to address, which I discuss in the following section before concluding this dissertation.

7.5. Limitations

The present study had a number of limitations that future research projects on the topics of language development in DLI and children’s acquisition of the subjunctive mood may be able to address. In §7.5.1, I return to the topic that I have mentioned throughout this chapter, the importance of addressing a broader range of ages in this line of research. In §7.5.2, I explore how the COVID-19 pandemic may have impacted the results obtained in this dissertation. In §7.5.3, I address the format and administration of the tasks and provide suggestions and adjustments for future studies with adolescent children. Next, in §7.5.4, I caution against interpreting the findings from the present study as representative of all DLI programs. Finally, in §7.5.5, I clarify that the present data are not capable of contributing to the discussion surrounding the nature of syntactic and semantic factors in the acquisition of the subjunctive mood.

7.5.1. Expanding the Scope of Development

As I argued throughout Chapter 6, the present study is inherently limited in its scope because it evaluated groups of middle school-aged HS. Since DLI programs in elementary schools frequently terminate in fifth grade, and those that continue through
the middle school years end in eighth grade, the two age groups studied herein are representative of the grammars of HS at the end of these programs. Using a group of seventh and eighth graders also allowed me to compare the results in this dissertation to those in Potowski’s (2007b) study on HL subjunctive mood development in an 80/20 TWI program.

Furthermore, I chose to study pre-adolescent and adolescent children precisely because they were old enough to complete the lengthy experimental tasks that I designed for this study. These tasks allowed me to address the role of lexical frequency and asymmetries between production and receptive knowledge, which had not yet been tested in older children prior to this study. Most studies on bilingual children have explored their development using short and interactive experiments, which makes them useful for working with a broader age span, including young school-aged or preschool children. This inherently limits the ability to evaluate the roles of frequency and differences between tasks, so the present study would not be appropriate for younger age groups.

Other studies on this topic (e.g., Corbet & Domínguez, 2020; Dracos & Requena, 2022; Flores et al., 2017; Montrul & Sánchez-Walker, 2013) have evaluated a far wider age span of children, which is useful when addressing childhood language development without considering the role of schooling. Since evaluating type of educational exposure was a central topic of this dissertation, it was necessary to control for age group in order to maximize the comparability of the immersion and non-immersion participants. However, with shorter and simpler tasks, it would be possible to collect data from younger groups of children to determine the impact of language development in the early immersion years, with the goal of sketching a developmental trajectory for the acquisition
of mood in bilingual and monolingual classrooms, which would build nicely upon the findings of the present study that reveal that chronological age – but not immersion – affected HS’ development of the subjunctive. This would also be useful for exploring the maintenance of this structure after the immersion years. That is, it is entirely feasible that immersion accelerates mood development in younger grades, or that children who have not received immersion in the HL reassemble their mood systems faster or more noticeably than graduates of bilingual programs. Since both possibilities could take place before fifth grade, the age of the younger participant groups in this study, the present data cannot shed light on either possibility.

Finally, it would be useful to compare the children in the present study to Spanish HS adults. This is a useful approach to HL acquisition research because it allows us to develop a more nuanced understanding of exactly when children converge on adult-like bilingual grammars. If adults were to use a given structure more than the children investigated in this study, a logical conclusion would be that the acquisition of said structure continues throughout the adolescent years. This in turn implies that bilingual adolescents are not child-like nor adult-like, but somewhere in between. However, if the DLI-7/8 and MLS-7/8 groups were equal to adults in the production and selection of mood, it appears that children have reached the adult-like mood system. Finally, if the DLI-7/8 and MLS-7/8 groups use more subjunctive than adults, this would imply U-shaped behavior whereby HS adults appear to restructure their knowledge of mood after the adolescent years (see Cuza et al., 2013 for an example of this trend concerning grammatical aspect). Lastly, as mentioned in this section, comparing children at multiple ages with adults is essential for understanding if any attrition has taken place in adult
grammars of structures that were once more productive in childhood. In sum, this type of design would have positive implications for providing a broader picture of HL acquisition more generally, but would potentially sacrifice testing receptive knowledge and/or lexical frequency.

7.5.2. The Impact of COVID-19

The present study took place during the second stage of the coronavirus pandemic, at the beginning of which time access to schools was necessarily limited. Schools were forced to close with very limited notice at the beginning of the pandemic and to transition to either synchronous or asynchronous remote instruction without adequate preparation. Although all schools closed nationwide in March 2020, individual districts determined their policy concerning how to provide instruction, which included in-person, synchronous remote, asynchronous remote, or hybrid learning. Therefore, the rapid school closure coupled with the sporadic return to in-person instruction makes it difficult to address the impact of the COVID-19 pandemic on academic achievement and language development at the school level. What is known is that assessment data during the pandemic was particularly difficult to collect from students of color and those who live in communities with low socioeconomic status (Hamilton & Ercikan, 2022). The absence of data concerning these students’ learning throughout the pandemic means that there is limited knowledge of how remote learning impacted these groups, who Hamilton and Ercikan (2022) argue were already at risk for lower levels of academic achievement before COVID-19.

The impact of the pandemic on language development has not yet been explored through empirical research, but it is important to recognize that, due to circumstances that
were unprecedented and not anticipatable, there is a strong possibility that the data obtained from the DLI-5 group in the present study may not be reflective of all cases of bilingual development throughout the late elementary years in immersion programs.

These children transitioned to weekly synchronous remote instruction in Spanish after school closure in March 2020 and then received asynchronous instruction in Spanish for the entirety of the 2020-2021 school year. This means that there was an eighteen-month period during which the HS in this study did not receive daily, in-person exposure to Spanish at school. For participants in fifth grade who were ten years old at the time of data collection, this amounts to 15% of their lifespan. The impact of the COVID-19 pandemic on the HL was probably less impactful for the DLI-7/8 group than for the fifth graders, given they were not actively enrolled in immersion at the time of data collection.

I collected the DLI-5 group’s data in March 2022. Since participants had returned to full-day, in-person learning at the beginning of that school year (September 2021), their exposure to Spanish had increased again over the period of approximately six months. It is not clear how quickly restructuring of the HL may ensue, so it is not possible to quantify the impact of the COVID-19 pandemic on this group’s knowledge and acquisition of Spanish.

From the perspective of linguistic theory, the sudden interruption in exposure to Spanish at school could have resulted in three possible outcomes. On one hand, if HS continue to develop their command of subjunctive mood with age and require high quantities of exposure, the approximately eighteen months of modified instruction between March 2020 and September 2021 may have had an adverse impact on their developmental trajectory, slowing down their acquisition. If this was the case, this could
explain why the DLI-5 students do not have an advantage over the MLS-5 participants in their production and selection of subjunctive mood morphology. In contrast, this sudden drop in exposure could have resulted in loss of knowledge that the DLI-5 students had already gained by third grade, in line with theories of attrition or reassembly (e.g., Hicks & Domínguez, 2020; Putnam & Sánchez, 2013). These first two possibilities are not mutually exclusive.

The third possibility is that the pandemic had no adverse impact on HL acquisition, as participants continued to receive extensive exposure to Spanish at home from their family members, potentially even more so than in the past. If this is the case, the HS in the monolingual school actually might have had *more* exposure to Spanish due to the pandemic, considering they were at home with their Spanish-speaking family members rather than at their English-speaking school. This group, however, returned to school in a hybrid, twice-per-week in-person format for the 2020-2021 academic year. Children who did not come into school physically were online with their English-speaking teachers the remaining days of the week. Therefore, the children who lived in this district had more contact with their classrooms, and they received synchronous schooling in English throughout the pandemic, which in turn reduces the likelihood that their exposure to Spanish dramatically increased during this time period.

To distinguish between these possibilities, it will therefore be worthwhile to repeat this experiment in subsequent academic years to compare language development on the heels of the worldwide pandemic with development occurring during years with more stable learning conditions. If children who did not participate in the immersion program during COVID-19 show similar results to those who did (that is, the DLI-5
participants in this study), this would point out that the pandemic was likely not the reason that HS in DLI did not have an advantage over their monolingually-educated peers. However, if fifth grade children who attend an immersion school show an advantage over monolingual children in the next few academic years, a logical conclusion is that the pandemic considerably impacted the results of this study.

In the wake of the circumstances surrounding data collection in the COVID-19 pandemic, the decision to computerize the tasks provided a more reliable method for data collection in the event of unexpected school closures. For instance, the use of voice recording technology and Qualtrics survey software made it possible to collect data from many participants simultaneously, which holds promise in the administration of future research projects with older children, particularly when we are able to administer norm-referenced assessments of language development in DLI programs (Thane et al., 2022). However, as I will address in the subsequent section, the use of technology may have been restrictive in some respects, which presents opportunities that researchers can address in future experiments.

7.5.3. Limitations of Experimental Tasks

7.5.3.1. Modal Bases. Some of these limitations pertain to task design and the structure of this experiment, which in some cases was due to what data could reliably be elicited through computers. For example, the EPT prompts were in written form, and participants responded orally, yet the FCT was a fully written activity, as it was more feasible to write out the receptive task than to embed audio files into Qualtrics. This methodological decision avoided the need for headphones, as it was not clear if students would have access to them in their schools or at home in the event of an emergency.
school closure. Therefore, there is a potential confound between task (production and interpretation) and modality (written and spoken) that future research may wish to avoid through the use of aural stimuli on the FCT. As Bowles (2011) states, HS benefit most from implicit and oral tasks given that they frequently do not receive literacy training or metalinguistic instruction in their HL.

Nevertheless, if literacy training and metalinguistic awareness are at the root of HS’ superior performance on oral measures, the MLS-5 and MLS-7/8 groups should have been more affected than the DLI-5 and DLI-7/8 groups given their lack of formal literacy training in the HL. Since this was not the case – in fact, the MLS-7/8 group slightly outperformed the DLI-7/8 participants in overall rates of subjunctive use – it does not appear that the asymmetrical knowledge between tasks was due to their modality. However, as stated above, future research may wish to integrate pre-recorded aural stimuli into computerized interpretation tasks to eliminate the possible confound between task type and modality.

7.4.3.2. Language Questionnaire. Secondly, the present study is unique in that the pre-adolescent and adolescent children completed their own language background questionnaires. Generally, research exploring school-aged populations has had parents complete questionnaires on their children’s behalf. In the present study, being in the late elementary years, even fifth grade HS were old enough to answer basic questions about their patterns of language use and exposure. One potential drawback of integrating this into the data collection session is that it lengthened the experiment that children needed to complete. Children were also not aware of their precise age at the onset of acquisition of English in many instances.
However, there were also some advantages of this approach. Firstly, children likely provided a more direct and accurate estimation of their use of the HL than their parents, who are, by definition, not with them while they are at school and/or interacting with (some of) their peers. Having children complete this questionnaire during the data collection session also avoided participant attrition due to unreturned or incomplete forms, and circumvented the role of parental literacy. It was also a more ecofriendly approach to data collection, as it obviated the need for physical forms. Therefore, the decision for children to complete the questionnaire, rather than their caregivers, had more advantages than drawbacks, although it required that the instrument was brief to avoid making the experiment unwieldy lengthy.

7.5.4. Generalizability of Findings

Given that linguistic research requires carefully-prepared experiments be administered to very specific participant groups, there are generally limits to the number of subjects who complete any study. The issue of generalizability is one that affects all subfields of experimental research on language acquisition: given the vast heterogeneity of HS in particular, replication studies are important, yet have been scant. The present study is no different, but the added layer of studying DLI makes generalizing these findings particularly difficult. As stated in Chapter 3, Watzinger-Tharp et al. (2018, p. 4) write that differences between immersion programs “Limit the ability to identify causal program effects or to generalize beyond a study’s particular context,” even in their research with vast amounts of data from standardized assessment scores.

Specifically, there are myriad factors that can shape the acquisition of Spanish in DLI programs, including but not limited to the type of immersion (OWI/TWI), length of
the program, concentration of partner language instruction, teacher training and proficiency, and teaching methods. Therefore, the present study makes a useful contribution to an interdisciplinary topic of measuring language development through bilingual education, but it is far from representative of all DLI programs nationwide. It also shows that, following García and Flores (2017), immersion does not miraculously eliminate the systemic inequalities that bilingual and bicultural learners frequently face at school, as there was minimal to no advantage for the DLI-5 and TWI-8 groups in their knowledge of the Spanish subjunctive mood (except for a subtle difference in the selection of subjunctive in relative clauses on the FCT).

Furthermore, the age groups studied were older children who represent grammatical development towards the end of immersion programs. Perhaps the greatest linguistic growth can be captured in the early immersion years, which reinforces the need to study this topic with younger children. Furthermore, it is entirely plausible that the effects observed in this study are specific to the subjunctive mood, a structure that is very difficult due to its syntactic, semantic, and pragmatic layers. It would be advisable for future studies to continue to study a wider spectrum of age groups and to explore other grammatical structures using similar methods to those employed in the present study.

Therefore, this study is a preliminary investigation into this topic that creates a foundation for future research in this area. Testing the impact of programmatic factors is the next logical step in this line of research: if children in 90/10 immersion programs or who spend more years in DLI show stronger command of certain aspects of grammar, these findings would have implications for the planning and implementation of bilingual
programs as well as for HL acquisition theory. Before concluding, I now shift my attention towards a final limitation of the present study.

7.5.5. Implications for a Theory of Subjunctive Mood

As I have stated throughout Chapters 2 and 4, an important current topic in the acquisition of subjunctive mood in Spanish as a HL concerns whether it is semantic entailments or syntactic and pragmatic context that shapes the development of this grammatical structure. On one hand, some studies (e.g., Pascual y Cabo et al., 2012; Montrul, 2009; van Osch et al., 2017) have argued for interface vulnerability because HS use the subjunctive most in intensional or lexically-predetermined contexts, while the majority of their mood variability occurs in pragmatically-conditioned polarity contexts such as relative clauses. However, these studies have not controlled for the modal base of the predicate. On the other hand, more recent studies (Dracos & Requena, 2022; Lustres et al., 2020; Perez-Cortes, 2021a) have shown that the contrast between obligatory uses of mood in intensional contexts and variable uses in polarity contexts is not an important consideration when holding modal base constant, which suggests that semantic factors, and not syntactic and pragmatic ones, are at the root of the acquisitional timeline for subjunctive mood morphology.

Volitional clauses belong to the deontic modal base, and since the use of the subjunctive is obligatory following verbs such as querer, it represents an intentional context where the mood feature is uninterpretable. That is, volitional clauses require subjunctive inflections under lexical selection from the matrix clause. Monolinguals appear to acquire the use of the subjunctive in these clauses first, along with that of other deontic predicates, between four and five years of age (Ahern & Torrens, 2021; Blake,
In contrast, both indicative and subjunctive morphology is grammatical in relative clauses, making it a polarity context where the mood feature is interpretable. Relative clauses are part of the epistemic modal base whereby mood selection is contingent upon pragmatic presupposition from the perspective of the speaker. Mood alterations in relative clauses appear to be acquired later, after the onset of schooling and concurrent with the development of false beliefs, between ages six and seven (Ahern & Torrens, 2021; Pérez-Leroux, 1998).

In my experiment, I deliberately chose two contexts of subjunctive mood that differ in their syntactic and semantic entailments, as the aim of my study was to determine if these two contexts of subjunctive mood would be equally susceptible to input effects. Since these two structures differ both in their syntactic representation and semantic modal base, they are maximally different in terms of their acquisitional timeline. Given that the acquisition of the subjunctive in volitional clauses takes place before the school period while that of relative clauses occurs after the beginning of schooling, a logical hypothesis is that the latter structure would benefit more substantially from sustained exposure to Spanish through DLI. Immersion students’ slight advantage in this context of subjunctive use supports this hypothesis.

Therefore, the data reported here cannot help to tease apart the roles of syntax and semantics in the acquisition of mood. A fruitful study on this topic would need to examine HS’ use of mood across all three modal bases (deontic, epistemic, epistemological) and both syntactic contexts in each base (intensional and polarity). Such an experiment would require six conditions with multiple stimuli in each, which would be too lengthy for the children who participated in the present study. In sum, my dissertation
is unable to contribute to this debate, so future research with adults, who have longer attention spans, is necessary.

7.5.6. Methods Towards a More Inclusive Perspective of Heritage Languages

It must be noted that in this dissertation, despite adopting the multiple baselines approach and exploring differences between HS and within a single speaker, there are two potential limitations with regards to how to create a perspective that embraces the complexity of HLs. The first relates to the decision to use the subjunctive mood as the structure of investigation, and whether it is essential for teachers in bilingual programs to correct students’ (dis)use of this structure. The second is how the statistical modeling was operationalized, focusing exclusively on the subjunctive rather than on participants’ overall knowledge of mood. Both areas have important implications and are addressed at greater length below.

7.5.6.1. The Subjunctive Mood and the Role of Correction. Regarding the first limitation, the subjunctive mood is an ideal testing ground for the study of heritage grammars precisely because it is a relatively infrequent structure (Biber et al., 2006; Kanwit & Geeslin, 2018) that has syntactic and pragmatic nuances. Secondly, it is possible to manipulate the lexical frequency and/or morphological regularity of verbs in experimental tasks, allowing us to achieve a more nuanced understanding of the HL lexicon overall. Finally, this structure occurs in multiple syntactic contexts, such as volitional and relative clauses, which allows researchers to determine whether the complexity of certain forms or the degree of interface with semantics or pragmatics influences their acquisition in HS. The subjunctive is a late-acquired structure, even for monolingual-speaking children who are endowed with more input in Spanish (at least
during the school years), so it is a useful structure through which to test the influence that additional exposure at school has on HL development. Therefore, from a linguistic perspective, there is much to gain through the study of this structure, as it provides novel information about the nature of HS’ grammatical systems and the architecture of HLs more generally, while elucidating the ways in which bilingual education facilitates acquisition.

However, the subjunctive does not have a high degree of communicative importance, such that its omission or substitution with indicative, infinitival, or other innovative forms often does not have implications for meaning. In an effort to legitimize the varieties of Spanish that HS speak, it may not be necessary to correct speakers who omit the subjunctive in contexts where prescriptive theory predicts its use. DLI teachers may wish to carry out explicit instruction concerning the use of this structure, but may not need to correct HS who omit it from their grammars, which simultaneously legitimizes the varieties of Spanish that bilinguals speak and allows educators to concentrate on more foundational components of grammar that are essential for communication and comprehensibility.

7.5.6.2. Signal Detection Theory. Secondly, although I presented indicative mood knowledge in §5.5.2.1, the present study concentrates on HS’ knowledge of the subjunctive without considering the role of the indicative in overall mastery of mood. That is, the present study, in alignment with most previous work on HL acquisition, did not consider HS’ knowledge of the indicative, a structure that HS appear to control well in the expected contexts and in fact overextend to many contexts of subjunctive use. A more complex method for analyzing HS’ knowledge of both the indicative and
subjunctive would be to apply signal detection theory, whereby speakers’ knowledge both of the target mood, the subjunctive, and of the alternative structure, the indicative, are computed together (see Dillon & Wagers, 2021; Huang & Ferreira, 2020 concerning the applicability of signal detection theory to language acquisition research). Since there were distractors in the present study eliciting indicative mood, such a calculation would be feasible, and may be desirable in future research. Concentrating on what HS know, alongside what they innovate and change, fosters a more holistic and inclusive perspective of HL acquisition that moves away from deficit perspectives that can be detrimental towards the way that HS are perceived and perceive their own linguistic knowledge.

7.5.6.3. Null Effects and Future Approaches. Finally, as mentioned in §7.5.4, it is necessary to document that some of the predictions made in the present study, specifically those for RQ3 and RQ4, posited null effects in the statistical modeling. These predictions are grounded in the theory that patterns of exposure are negatively correlated with HS’ sensitivity to lexical frequency effects and asymmetries between production and comprehension (Perez-Cortes et al., 2019; Putnam & Sánchez, 2013), such that these variables do not influence HS with more frequent use of the HL. In a similar vein, previous findings have shown that patterns of exposure affect the rate of development of subjunctive mood morphology (Flores et al., 2017), so it was predicted that HS with sustained exposure to the HL in DLI schools would plausibly already have acquired subjunctive mood morphology in the expected contexts by fifth grade. However, the absence of effects in the linear regression modeling of this study are not definitive. A more appropriate future method for reducing the likelihood of overestimating null effects
would be that of Bayesian statistics, which incorporates a probability distribution into its estimates. This method has not been prevalent in recent linguistic research, but has previously been applied to sociovariationist analyses of L2 subject pronoun expression (see Gudmestad et al., 2013).

7.5.6.4. Summary. To conclude, although the present dissertation has exploited the intricacies of the subjunctive mood, this structure in and of itself is not essential for communication in Spanish in many contexts (e.g., the substitution of the indicative form in place of the subjunctive has few interpretable consequences in most instances). Therefore, it may not be fruitful for teachers in bilingual schools to concentrate on the explicit instruction of this structure, and it may be more beneficial to consider HS’ overall knowledge of mood by taking the far more frequent and greater-used indicative into consideration. The only disadvantage of this approach is that it generates an average level of mood sensitivity for each participant, which prevents analyzing variability at the within-speaker level. Therefore, both traditional methods and signal detection theory could be utilized simultaneously in future acquisitional research. Finally, more advanced statistical modeling such as Bayesian statistics would be a useful and powerful tool to better flush out the absence of effects of age, frequency, and asymmetries between productive and receptive knowledge that formed parts of this study’s predictions.

7.6. Conclusion

In Chapter 1, I began this dissertation by spelling out three objectives of HL acquisition that I have taken up in my dissertation. Firstly, research on HL acquisition should document the structural changes that give shape to heritage varieties. Secondly, this line of research should contribute to the development of theories of HL acquisition
and bilingual competence, so that we better understand the nature of heritage grammars and the factors that account for the process that give rise to them. Finally, the implications of research in HL acquisition should inform parallel fields and contribute to social justice for multilingual and multicultural people. Situated within these three goals, I explored how DLI, an additive method of bilingual education, affects the development of the Spanish subjunctive, a complex morphosyntactic structure that previous research has shown differs considerably between heritage and non-heritage varieties of Spanish (e.g., Bookhammer, 2013; Giancaspro, 2019a, 2019b, 2020; Lustres et al., 2020; Montrul, 2009; Montrul & Perpiñán, 2011; Perez-Cortes, 2021a, 2021b, 2022; van Osch et al., 2017).

At the beginning of this dissertation, I also presented and explained the theories of HL acquisition that have been fruitful for accounting for the greatly heterogeneous knowledge that HS show. Although I argue that traditional theories of incomplete acquisition (Montrul, 2002, 2013) and attrition (e.g., Hicks & Domínguez, 2020) do not capture the finer-grained levels of variability that we can explore in heritage grammars, I recognize the immense contributions to the field of Spanish as a HL investigated under these frameworks. More recently, theories of input quality (Pascual y Cabo & Rothman, 2012) and particularly the activation of linguistic features (Putnam & Sánchez, 2013) have predominated in the field because they focus on the intergenerational and within-speaker processes that can give rise to HL change. Research across these frameworks has allowed us to develop tools for capturing variability at each of these levels, and this dissertation was developed to do so with older Spanish HS children.
Across these frameworks, research on bilingual children who are in pre-adolescence or adolescence has been rare. The acquisition of Spanish as a HL during these formative years has theoretical import because older children may share some characteristics of child grammars as well as some of those of adults. In fact, the limited data on this topic have shown that sometimes, pre-adolescent HS children are in a group of their own, whereby they show higher percentages of use of a particular structure than HS adults as well as younger children (Cuza et al., 2013). As Montrul (2013) states, focusing on bilingual children in this age span enables us to develop a more complete panorama of the paths of HL acquisition, which can include differential levels of attainment of a particular structure, attrition or restructuring, or both.

I provided a more thorough review of the subjunctive mood in Chapter 2. This structure has been a particularly fertile testing ground for theories of HL acquisition because of its syntactic, semantic, and pragmatic nuances. This structure is far less common than the indicative mood, occurring in only 7% of verbal inflections in a corpus analysis of over two million words (Biber et al., 2006). The relative infrequency and high complexity of this structure make it very challenging to acquire, particularly in contexts of bilingualism where there is reduced exposure to the HL. Furthermore, this structure has many syntactic, semantic, and pragmatic nuances. Theorists have proposed that the subjunctive occurs in two different sets of syntactic contexts (e.g., Quer, 2009; Kempchinsky, 2009): the intensional context, in which use of the subjunctive is obligatory due to lexical selection, and the polarity context, in which use of the subjunctive varies with the indicative, but selection of mood is contingent upon the pragmatic notion of presupposition.
Early research on adult HS’ acquisition of subjunctive mood reported that syntactic context – intensional subjunctive versus polarity subjunctive – accounted for differences in HS’ knowledge of this structure. More recent research has shown that the acquisition of the subjunctive actually depends on modality, and not syntactic context, as its functions can be grouped into deontic, epistemic, and epistemological modal bases (Dracos & Requena, 2022; Lustres et al., 2021; Perez-Cortes, 2021a). This framework has also been maximally successful in describing the acquisitional timeline in monolingual children (Ahern & Torrens, 2021; Blake, 1983; Dracos et al., 2019; Pérez-Leroux, 1998). Given that linguistic theory has dedicated over thirty years of research to the study of the underlying structure of mood and its acquisition in monolingual and bilingual populations, it is hardly surprising that even monolingual children continue to fine-tune their knowledge of mood through the pre-adolescent or even the adolescent years (Blake, 2013; Dracos et al., 2019).

In this dissertation, I studied two contexts in which subjunctive mood is used: volitional clauses and relative clauses. Volitional clauses represent a context of intensional subjunctive in the deontic modal base that monolingual children begin to use at ceiling between ages four and five (Ahern & Torrens, 2021; Blake, 1983; Dracos et al., 2019). Previous studies have shown that these contexts of subjunctive mood are among the most stable in child (Dracos & Requena, 2022) and adult (Montrul, 2009; Montrul & Perpiñán, 2011) HS.

In contrast, the subjunctive mood in relative clauses is more complex, as the mood feature is interpretable and encodes a nonpresuppositional interpretation. Monolingual children are only able to attend to mood alterations in relative clauses once
they have acquired the Theory of Mind skill of false beliefs, which emerges as late as between six and seven years of age (Ahern & Torrens, 2021; Pérez-Leroux, 1998). Despite considerable variability in adult HS’ use of the polarity/epistemic subjunctive in relative clauses (Giancaspro, 2019a; Montrul, 2009; van Osch et al., 2017), it has not been the object of extensive research with bilingual children, save for a single sentence in Potowski’s (2007b) experiment. Given the acquisition of mood alterations in relative clauses occurs after the beginning of schooling, studying these two contexts of the subjunctive mood allows us to compare the impact of bilingual education on the development before schooling with those that emerge during the school period.

Studying the subjunctive within the context of bilingual education is particularly fruitful for two reasons. A widely-held but seldom-tested assumption is that HS children in DLI programs should exhibit higher levels of proficiency in Spanish than those individuals in monolingual English-speaking schools. As I addressed in Chapter 3, the benefits of DLI include higher academic success (e.g., Marian et al., 2013; Thomas & Collier, 2002), superior cognitive control (Barbu et al., 2019; Garraffa et al., 2021; Nicolay & Poncelet, 2015), heightened cultural sensitivity (Bearse & de Jong, 2008), and greater likelihood of completing secondary school (Christian et al., 2004). However, the assumption that HS students in immersion programs obtain higher proficiency in difficult aspects of their HL requires an experiment that tests their grammatical knowledge relative to a group of children with similar linguistic and demographic profiles who attend a monolingual school. Only one such study (Gathercole, 2002b) has taken such an approach, but this investigation focused on younger children acquiring grammatical gender, a more straightforward structure that is far more frequent and that is acquired
earlier. Therefore, the study of immersion education has lacked an experimental research agenda that compares the grammars of its HL students with those of children in a monolingual school. If DLI provides sustained exposure to the HL, and exposure affects the timing of acquisition, it would follow that particularly challenging and late-acquired structures such as the subjunctive mood would benefit most of all from this method of education.

To address this topic, this dissertation incorporated four RQs that evaluated the three levels of variability in HS’ knowledge of the Spanish subjunctive mood that I presented in Chapter 1. In RQ1, I explored between-group differences, that is, the way that HS children differ from a group of adults raised in a Spanish-speaking environment in their use of the subjunctive in volitional and relative clauses. Secondly, I addressed within-group differences in RQs 2 and 3. Specifically, I compared four groups of HS children who differed in their type of schooling (DLI versus traditional monolingual education) and age (fifth grade and seventh/eighth grade). I also evaluated the current frequency of use of Spanish across participants in these four groups. Finally, I explored intraspeaker (within-speaker) variability in RQ4 by addressing the role of the lexical frequency of the subordinate verb as well as the influence of asymmetrical knowledge between mood production and selection on participants’ use of the subjunctive mood.

One advantage of this study is that I integrated a multiple baselines design to compare groups of HS to one another in addition to a group of SDB adults. This approach allowed me to compare the variability between groups of HS who differed in age and educational exposure to the HL, which goes beyond simply using non-HS as a point of comparison. Through this work, I also compared HS of similar age groups and similar
contexts of exposure to one another. This contributes to what Giancaspro et al. (2022) term the paradigm shift in HL research, whereby we have begun to turn our attention towards the remarkable intricacies of HL grammars rather than simply comparing these bilinguals to a prescriptivist norm, which has potentially pejorative consequences.

To answer these RQs, a total of 93 participants carried out an the EPT and the FCT, which tapped their production and selection of mood, respectively. The results showed that the SDB adult baseline used more subjunctive mood than all four groups of Spanish HS children. Their use of the subjunctive in volitional clauses was at ceiling across tasks, although there was considerable variability in their production and selection of the subjunctive in relative clauses, which may imply restructuring of mood in this context. The two groups of seventh and eighth grade HS produced and selected more subjunctive than the two fifth grade groups, but there was no difference at either grade level between children from the 50/50 DLI program and those who attended a monolingual school in overall rates of subjunctive use. The DLI students at both grade levels selected the subjunctive approximately 10% more frequently in relative clauses on the FCT than monolingually-educated peers, which implies a slight advantage for immersion in the acquisition of the later-acquired structures. All four groups selected the subjunctive more frequently than they produced it, but there was no effect of lexical frequency found in these data.

By bringing together research on HL acquisition, the Spanish subjunctive mood, and DLI education, I was able to contribute to the three goals advanced in Chapter 1. Regarding the first, my study contributes to a growing body of work that shows that HS’ subjunctive mood knowledge is highly systematic, albeit different from monolingual or
SDB baselines (e.g., Bookhammer, 2013; Giancaspro, 2019a, 2019b, 2020; Giancaspro et al., 2022; Perez-Cortes, 2021a, 2021b, 2022). The HS in my experiment showed more use of the subjunctive in volitional clauses than in relative clauses, which is consistent with past research on adults (e.g., Giancaspro, 2019a; van Osch et al., 2017), and is in line with Potowski’s (2007b) smaller-scale study on this topic with seventh and eighth grade HS in a TWI program.

The second goal of this study was to contribute to theoretical models concerning the acquisition of HLs and of bilingual competence more generally. The fact that HS appear to use quantitatively less subjunctive mood than bilingual adults is consistent with research within the framework of incomplete acquisition; however, the effect for age of acquisition is contra the predictions of this hypothesis. Furthermore, since seventh and eighth graders used more subjunctive than the younger fifth grade children, it is not clear if HS continue to acquire this structure later into childhood or into adulthood. Furthermore, the data available argue against any type of attrition of subjunctive mood in the age range studied, so the representational deficits frameworks laid out in Chapter 1 do not appear to be a neat fit for these findings.

There appear to be some differences in the contact variety to which HS receive exposure, which shows that linguistic knowledge can evolve over time (Pascual y Cabo & Rothman, 2012), but these changes cannot capture the full extent of variability in these children’s data. In this study, the HS children’s command of mood improved with age, even when the DLI-7/8 group was faced with a considerable decrease in exposure to Spanish. In contrast, there was a minute effect for frequency of use of Spanish on HS’ production and selection of the subjunctive mood, which does support this framework.
Therefore, while the data from this study partially support theories of input quality and the activation of features, they do not line up with all of the predictions that these frameworks advance. Interestingly, the school-aged children’s patterns of subjunctive mood use support some, but not all, of the predictions of each of the three theories of acquisition (when discarding attrition, which is a theory of language loss). This underscores the importance of exploring language development across the childhood and adolescent years, as this is a necessary step to understanding how HLs emerge and change over time and which theories can best account for this process.

The present study showed that the effect of lexical frequency of the subordinate verb, which Giancaspro (2020) demonstrated affects adult HS’ knowledge of subjunctive mood, does not extend to pre-adolescent and adolescent children. However, the differences between production and receptive knowledge that multiple previous studies have found to impact adult HS (e.g., Giancaspro & Sánchez, 2021; Perez-Cortes, 2016; Sherkina-Lieber, 2015) also appeared to affect children’s within-speaker knowledge of this complex morphosyntactic structure, as hypothesized. Therefore, some of the variables that appear to affect adult HS’ grammars, such as asymmetrical knowledge between production and receptive knowledge and, to a lesser degree, current frequency of use of the HL, also impacted the bilingual children in this study. However, lexical frequency did not affect this group’s knowledge of subjunctive mood in either task. Thus, the HS in this study showed some similarities to adults, but also some differences.

The third goal of HL acquisition concerns the ways through which these findings can inform parallel fields such as bilingual education and language pedagogy. In this chapter, I discussed how these findings have implications for our knowledge of language
development in DLI programs. One important finding in comparing this study to previous research is that quantity of exposure to the HL may affect its acquisition. When comparing the lower rates of subjunctive production in this study with those in Potowski (2007b), whose participants had more exposure to Spanish, a logical conclusion is that a greater quantity of immersion is needed to maximize the acquisition of complex morphosyntactic structures such as subjunctive mood. Implementing a greater number of immersion programs that have a 90/10 balance of instruction requires the formation of a pipeline for teacher preparation, which in turn entails investing in their academic language proficiency and pedagogical skills.

It is also possible that for some HS children, the acquisition of the subjunctive mood in the HL depends on support through explicit instruction. Harley (1993) argues that some degree of form-focused instruction is useful for teaching the partner language in DLI programs. Further, Hulstijn (2001) described that, even in monolingual contexts, infrequent morphosyntactic structures that have low communicative value and that predominantly occur in academic registers are part of higher language cognition, which develops through formal education. The subjunctive may be one such property, so dedicating time to explicit instruction in DLI is essential. Since there is limited research on the best pedagogical practices for teaching grammar in bilingual education, or for integrating language into content area learning, it is imperative to propose possible strategies for HL instruction in immersion classrooms. Selecting appropriate pedagogies relies on straddling the balance between separation of content areas and encouraging pedagogical translanguaging in a way that facilitates the acquisition of English and the partner language. Teaching for biliteracy (Urow & Beeman, 2013) and Processing
Instruction (VanPatten, 1996, 2002, 2004, 2015) are possible techniques that can be integrated into the content areas or used during language arts instruction and that may prove fruitful in teaching grammar explicitly while actively encouraging translanguaging practices.

As I described in this chapter, there were multiple limitations to this experiment. Firstly, it would have been preferable to administer these tasks to a broader age range, but doing so would have come at the expense of addressing lexical frequency and production-interpretation asymmetries. Secondly, the impact of the COVID-19 pandemic on language development is nearly impossible to quantify, so the present dissertation may not be an ideal reflection of DLI education under more typical circumstances. Furthermore, technology was useful in navigating the challenges of data collection during the tail end of the COVID-19 pandemic, and had some important advantages for future research. However, with the computerization of tasks came some limitations in experimental design. This included the administration of a written receptive task and a short questionnaire that participants completed independently. While older children’s own perceptions of their language use are likely more accurate than their parents’, their limited attention spans meant that asking questions about output or multiple contexts of family language exposure was not feasible, although it may have been necessary to capture the full extent of variability between participants.

In addition, these results merely comprise an early investigation into the role of immersion schooling relative to monolingual education, as there are many programmatic factors that may affect results. Finally, the two contexts of subjunctive mood integrated into the experimental tasks differed both in their syntactic-pragmatic representation and
their modal base, which means that they cannot contribute to the recent discussion concerning the factors affecting mood acquisition more generally. Despite these limitations, the present dissertation has made novel contributions to HL theory and bilingual education in the ways laid out throughout this chapter, and these limitations create opportunities for future research.

These limitations aside, the present dissertation is but a first step in the process of better understanding the impact of bilingual education on HL acquisition and maintenance through a comparative study of grammatical development in school-aged populations. By using linguistic methods that are traditionally employed in research with adults, the findings advance our knowledge of HL acquisition in childhood populations. More importantly, they highlight that a widespread assumption about DLI education, that HS enrolled in immersion programs automatically develop higher levels of proficiency in the HL when compared to peers who attend monolingual schools, is not necessarily true for all children and all linguistic structures. Furthermore, these findings make inroads into applying recent methodologies used with adult HS to children, thereby making contributions to HL acquisition theory. For this reason, and perhaps of greatest importance, the present study puts a foundation in place upon which we can explore the best practices and policies for supporting HL development in DLI, with the goal of creating more equitable and linguistically just practices for bilingual children.
REFERENCES


Moreno-Villamar, & A. Soto-Corominas (Eds.), *Romance languages and linguistic theory: Selected papers from the 44th Linguistic Symposium on Romance Languages* (pp. 209–227). John Benjamins.


Barac, R., & Bialystok, E. (2012). Bilingual effects on cognitive and linguistic development: Role of language, cultural background, and education: Language, culture, education, and bilingualism. *Child Development*, 83(2), 413–422. https://doi.org/10.1111/j.1467-8624.2011.01707.x


https://www.pearsonassessments.com/store/usassessments/en/Store/Professional-


Language Acquisition, 25(1), 72–84. https://doi.org/10.1080/10489223.2016.1192636


https://doi.org/10.1017/S0142716403000158


https://doi.org/10.1017/S0272263100011980


(Eds.), *Pathways to multilingualism* (pp. 177–200). Multilingual Matters. https://doi.org/10.21832/9781847690371-012


Conference on the Acquisition of Spanish and Portuguese as First and Second Languages (pp. 123–136). Cascadilla Proceedings Project.


Putnam, M. T., & Sánchez, L. (2013). What’s so incomplete about incomplete acquisition?: A prolegomenon to modeling heritage language grammars. Linguistic Approaches to Bilingualism, 3(4), 478–508. https://doi.org/10.1075/lab.3.4.04put


The College of New Jersey. (n.d.). *The College of New Jersey academic evaluation requirements for the certification program: Bilingual certification.* https://tesl.tcnj.edu/certification/bilingual-certification/


World-Class Instructional Design and Assessment. (n.d.). *ACCESS for ELLs*. https://wida.wisc.edu/assess/access


## APPENDIX A: Previous Research on the Acquisition of Subjunctive Mood in Spanish as a Heritage Language

<table>
<thead>
<tr>
<th>STUDY</th>
<th>n</th>
<th>CONTEXT</th>
<th>TASKS</th>
<th>FACTORS</th>
<th>SUMMARY</th>
</tr>
</thead>
</table>
| Dracos & Requena (2022)| 50 | Volition| Elicited production            | Proficiency SPA use Context  | • Proficiency and amount of use of Spanish affected rates of production of subjunctive in 3 contexts  
• Greater production of subjunctive in volitional clauses than in both adverbial clauses  
• No difference in production in intensional versus polarity contexts in adverbial clauses  
• Age at time of experiment did not modulate results (participants between 5 and 15 years) |
| Giancaspro (2017)      | 42 | Purpose clauses Relative clauses| Elicited production Acceptability judgment Forced choice | AoA Proficiency Syntax LexFreq | • HS were more likely to use intensional subjunctive (purpose clauses) than polarity subjunctive (relative clauses) |

---

54 See also Giancaspro (2019a, 2019b, 2020).

55 Note that Ahern and Torrens (2021) and Perez-Cortes (2021b) describe that purpose clauses pertain to deontic modality, despite other sources (Dracos et al., 2019; Pérez-Leroux, 1998) that claim that all adverbial clauses pertain to epistemic modality.
<table>
<thead>
<tr>
<th>STUDY</th>
<th>n</th>
<th>CONTEXT</th>
<th>TASKS</th>
<th>FACTORS</th>
<th>SUMMARY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Context</td>
<td>Syntax</td>
<td>Type</td>
<td>Base</td>
</tr>
<tr>
<td>Giancaspro, Perez-Cortes, &amp; Higdon (2022)</td>
<td>42</td>
<td>Purpose clauses</td>
<td>Adv</td>
<td>INT</td>
<td>DEON</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>López-Beltrán Forcada (2021)</td>
<td>33</td>
<td>Lexical subj. Negation</td>
<td>Nom Adv</td>
<td>INT</td>
<td>POL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STUDY</td>
<td>n</td>
<td>CONTEXT</td>
<td>TASKS</td>
<td>FACTORS</td>
<td>SUMMARY</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>----</td>
<td>----------</td>
<td>---------------------------</td>
<td>------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Context</td>
<td>Syntax Type Base</td>
<td></td>
<td>and processing of subjunctive</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Frequency of matrix verb affected production and processing of subjunctive</td>
</tr>
<tr>
<td>Lustres (2018) (^{56})</td>
<td>20</td>
<td>Concessives</td>
<td>Adv Adv Both EPIS EPIS</td>
<td>Sentence completion Acceptability judgment Forced choice</td>
<td>Syntax No effect for intensional versus polarity subjunctive within epistemic modality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Antes de que Cuando</td>
<td>Adv Adv INT POL EPIS EPIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Martínez Mira (2006) (^{57})</td>
<td>139</td>
<td>Concessives</td>
<td>POL INT Adv EPIS EPIS</td>
<td>Written questionnaire Oral interview</td>
<td>Context Task Generation HS were most likely to use the subjunctive in purpose and concessive clauses Greatest variability in production of 'cuando', especially in aspectual contexts HS in New Mexico who were later generations of Spanish speakers were less likely to use the subjunctive Oral production resulted in overall fewer contexts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Purpose clauses</td>
<td>Cuando</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>See also Lustres et al. (2020).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>See also Martínez Mira (2009a, 2009b, 2010).</td>
</tr>
<tr>
<td>STUDY</td>
<td>n</td>
<td>CONTEXT</td>
<td>TASKS</td>
<td>FACTORS</td>
<td>SUMMARY</td>
</tr>
<tr>
<td>------------------------------</td>
<td>----</td>
<td>---------</td>
<td>------------------------</td>
<td>-------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Montrul (2009)(^{58})</td>
<td>65</td>
<td>Volition</td>
<td>Cloze passage</td>
<td>Proficiency</td>
<td>of subjunctive use than in the written questionnaire</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Relative clauses</td>
<td>Oral elicitation</td>
<td>Context</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cuando De manera que</td>
<td>Sentence conjunction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nom</td>
<td>INT</td>
<td>DEON</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adj</td>
<td>POL</td>
<td>EPIS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adv</td>
<td>POL</td>
<td>EPIS</td>
<td></td>
</tr>
<tr>
<td>Montrul &amp; Perpiñán (2011)</td>
<td>60</td>
<td>Volition</td>
<td>Cloze passage</td>
<td>Proficiency</td>
<td>Volitional clauses addressed in cloze task and other conditions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Relative clauses</td>
<td>Oral elicitation</td>
<td>Context</td>
<td>difficult to compare results between intensional and polarity contrasts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cuando De manera que</td>
<td>Sentence conjunction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nom</td>
<td>INT</td>
<td>DEON</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adj</td>
<td>POL</td>
<td>EPIS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adv</td>
<td>POL</td>
<td>EPIS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adv</td>
<td>POL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^{58}\) See also Montrul (2007).
<table>
<thead>
<tr>
<th>STUDY</th>
<th>$n$</th>
<th>CONTEXT</th>
<th>TASKS</th>
<th>FACTORS</th>
<th>SUMMARY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Context</td>
<td>Syntax</td>
<td>Type</td>
<td>Base</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Felicity judgment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Interface</td>
<td>Proficiency</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Proficiency</td>
<td>AoA</td>
<td>SPA use</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Syntax</td>
<td>LexFreq</td>
<td>Regularity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pascual y Cabo et al. (2012)</td>
<td>47</td>
<td>Negation</td>
<td>Adv</td>
<td>POL</td>
<td>ELOG</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Proficiency</td>
</tr>
<tr>
<td>Perez-Cortes (2016)&lt;sup&gt;59&lt;/sup&gt;</td>
<td>69</td>
<td>Volition Directives</td>
<td>Nom</td>
<td>INT</td>
<td>POL</td>
</tr>
</tbody>
</table>

---

<sup>59</sup> See also Perez-Cortes (2021a, 2021b, 2022).
<table>
<thead>
<tr>
<th>STUDY</th>
<th>$n$</th>
<th>CONTEXT</th>
<th>TASKS</th>
<th>FACTORS</th>
<th>SUMMARY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Context</td>
<td>Syntax Type Base</td>
<td></td>
<td>• Greater recognition of subjunctive on receptive tasks than production</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Frequency of directive matrix verbs affected subjunctive production</td>
<td>• Morphological regularity of subordinate verb affected subjunctive production in directives</td>
</tr>
<tr>
<td>van Osch &amp; Sleeman (2018)</td>
<td>17</td>
<td>Volition Negation</td>
<td>Nom Adv INT POL DEON ELOG EPIS</td>
<td>• Elicited production • Acceptability judgment Context Task HS/L2L</td>
<td>• HS accepted subjunctive most frequently following volitional clauses, less frequently in relative clauses, and least with negated epistemic verbs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Relative clauses</td>
<td></td>
<td></td>
<td>• Results support “strong” Interface Hypothesis (Sorace &amp; Filiaci, 2006): core syntax &gt; syntax/semantics &gt; syntax/pragmatics</td>
</tr>
</tbody>
</table>

---

60 See also van Osch et al. (2017, 2018).

61 As mentioned in Ch. 1, the notion of interface has been difficult to define precisely. van Osch et al. (2017) describe that relative clauses pertain to the internal interface between syntax and semantics, rather than the pragmatics interface in which speakers’ perspectives are encoded through mood selection. However, Pérez-Leroux (1998) found that mood selection in relative clauses is contingent upon the development of Theory of Mind, which is an extralinguistic (and therefore pragmatic) factor. The authors do not make specific mention of this discrepancy in the research literature.
<table>
<thead>
<tr>
<th>STUDY</th>
<th>n</th>
<th>CONTEXT</th>
<th>TASKS</th>
<th>FACTORS</th>
<th>SUMMARY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Context</td>
<td>Syntax</td>
<td>Type</td>
<td>Base</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Abbreviations used in Appendix A

<table>
<thead>
<tr>
<th>Clause types</th>
<th>Subjunctive type</th>
<th>Modal bases</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adj</td>
<td>Adjecival clause</td>
<td>DEON Deontic modality</td>
<td>AoA Age of English acquisition</td>
</tr>
<tr>
<td>Adv</td>
<td>Adverbial clause</td>
<td>INT Intensional</td>
<td>HS/L2L Comparison of HS and L2L</td>
</tr>
<tr>
<td>Nom</td>
<td>Nominal clause</td>
<td>POL Polarity</td>
<td>LexFreq Lexical frequency</td>
</tr>
<tr>
<td>SC</td>
<td>Sentential complement</td>
<td>EPIS Epistemic modality</td>
<td>SPA use Frequency of use of Spanish</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ELOG Epistemological modality</td>
<td></td>
</tr>
</tbody>
</table>


## APPENDIX B: Previous Research on the Acquisition of Spanish in Dual-Language Immersion

<table>
<thead>
<tr>
<th>Property</th>
<th>Age group</th>
<th>Model</th>
<th>Study</th>
<th>Tasks</th>
<th>Summary of results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grammatical gender</td>
<td>2(^{\text{nd}})/5(^{\text{th}}) grade; HS in monolingual schools (n = 106) and HS in TWI programs (n = 106)</td>
<td>Not specified</td>
<td>Gathercole (2002a)</td>
<td>Grammaticality judgment</td>
<td>Fifth-grade HS who used Spanish at home and in TWI were more accurate in judgments of opaque gender morphology than younger, monolingually-educated HS.</td>
</tr>
<tr>
<td></td>
<td>1(^{\text{st}})/3(^{\text{rd}})/5(^{\text{th}}) grade; sequential (n = 22) and simultaneous (n = 16) HS</td>
<td>80/20</td>
<td>Montrul &amp; Potowski (2007)</td>
<td>Oral retell</td>
<td>HS were accurate in the oral retell task; simultaneous HS were less accurate than sequential HS in feminine gender production in the oral picture description task.</td>
</tr>
<tr>
<td>Subjunctive mood</td>
<td>7(^{\text{th}})/8(^{\text{th}}) grade (n = 30)</td>
<td>50/50</td>
<td>Potowski (2007a,b)</td>
<td>Written cloze passage</td>
<td>HS obtained average accuracy scores within the range of Spanish-dominant participants for present subjunctive, but not imperfect subjunctive.</td>
</tr>
<tr>
<td>Conditional</td>
<td>7(^{\text{th}})/8(^{\text{th}}) grade (n = 30)</td>
<td>80/20</td>
<td>Potowski (2007a,b)</td>
<td>Written cloze passage</td>
<td>HS obtained similar average accuracy scores to Spanish-dominant participants.</td>
</tr>
<tr>
<td>Sociolinguistic competence</td>
<td>7(^{\text{th}})/8(^{\text{th}}) grade (n = 30)</td>
<td>80/20</td>
<td>Potowski (2007a,b)</td>
<td>Informal email</td>
<td>HS obtained lower difference in formality scores than Spanish-dominant speakers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Formal letter</td>
<td></td>
</tr>
<tr>
<td>Person/number agreement</td>
<td>4(^{\text{th}}) grade (n = 41)</td>
<td>50/50</td>
<td>Fernández-Dobao &amp; Herschensohn (2020)</td>
<td>Written email</td>
<td>HS obtained accuracy scores within the range of Spanish-dominant speakers across all tasks.</td>
</tr>
<tr>
<td>Property</td>
<td>Age group</td>
<td>Model</td>
<td>Study</td>
<td>Tasks</td>
<td>Summary of results</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>----------------------------------------------</td>
<td>-------</td>
<td>--------------------------------------------</td>
<td>--------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Preterit/imperfect aspectual contrast</td>
<td>$7^{th}/8^{th}$ grade ($n=30$)</td>
<td>80/20</td>
<td>Potowski (2005)</td>
<td>Oral retell</td>
<td>HS tended to produce states with imperfect morphology and achievements with preterit morphology; highly infrequent use of accomplishments or activities with either aspect.</td>
</tr>
<tr>
<td>Stem-changing verbs</td>
<td>$4^{th}$ grade ($n=41$)</td>
<td>50/50</td>
<td>Fernández-Dobao &amp; Herschensohn (2020)</td>
<td>Oral picture description</td>
<td>HS obtained 56% accuracy in the picture task and 89% accuracy in the email task, below the range of Spanish-dominant controls.</td>
</tr>
<tr>
<td>Irregular verbs</td>
<td>$4^{th}$ grade ($n=41$)</td>
<td>50/50</td>
<td>Fernández-Dobao &amp; Herschensohn (2021)</td>
<td>Oral picture description</td>
<td>HS obtained accuracy rates within the range of Spanish-dominant controls.</td>
</tr>
<tr>
<td>Dative experiencer verbs</td>
<td>$7^{th}/8^{th}$ grade ($n=30$)</td>
<td>80/20</td>
<td>Potowski (2007a)</td>
<td>Written cloze passage</td>
<td>HS made frequent number agreement errors with the dative clitic and with the verbal inflection, implying syntactic transfer from English.</td>
</tr>
<tr>
<td>Infinitival subjects</td>
<td>$7^{th}/8^{th}$ grade ($n=30$)</td>
<td>80/20</td>
<td>Potowski (2007a)</td>
<td>Written cloze passage</td>
<td>HS almost always substituted gerunds for infinitives in subject position, suggesting syntactic transfer from English.</td>
</tr>
<tr>
<td>Property</td>
<td>Age group</td>
<td>Model</td>
<td>Study</td>
<td>Tasks</td>
<td>Summary of results</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------</td>
<td>-------</td>
<td>----------------------</td>
<td>------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Null subjects</td>
<td>Kindergarten (n = 30)</td>
<td>50/50</td>
<td>Sánchez et al. (2023)</td>
<td>Acceptability judgment Forced choice task</td>
<td>HS preference for null subjects in continuous contexts was driven by level of HL output, but there was no evidence of transfer of the null subject parameter to English.</td>
</tr>
</tbody>
</table>
APPENDIX C: Transcript of Language Use Questionnaire

Note: questions marked with * were administered to the SDB adult participants only.

1. How old were you when you first started learning English?

2. From which country/territory did you or your family members who were born outside of the mainland U.S. come from?*

3. Were you born in the United States? If not, when did you move to the U.S.?*

4. Have you spent time in a Spanish-speaking nation after childhood (adolescence, adulthood)? If so, where and for how long?*

5. Please check off all of the people in your family who speak English.
   a. Mother
   b. Father
   c. Brothers and sisters
   d. Other

6. Please check off all of the people in your family who speak Spanish.
   a. Mother
   b. Father
   c. Brothers and sisters
   d. Other

7. About how many friends do you use Spanish with?

8. How many people do you use Spanish with in your house?*

9. How many family members do you use Spanish with?

10. How often do you use Spanish in the following situations? (0-5 Likert scale)
    a. With parents
    b. With other family members
    c. With friends
    d. At school/work
    e. In public
    f. While watching T.V. or using the Internet

11. Is Spanish useful in your future?* (4-level Likert scale)

12. Is Spanish important in your daily life?* (4-level Likert scale)

13. Is Spanish interesting to learn?* (4-level Likert scale)
APPENDIX D: Transcript of Full Adult Elicited Production Task

1. Juan está un poco preocupado porque es difícil hacer amigos en el campamento y a veces es tímido. ¿Qué le preocupa? Tiene miedo de _______ (HABLAR) con personas desconocidas.

2. 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.


4. La mamá piensa que es importante cenar como familia. Sabe que todos los niños en el campamento pueden cenar juntos. ¿Qué sabe la mamá? Sabe que hay personas que ________ (CENAR) con Juanito.

5. Juanito disfruta de la naturaleza. Camina en el bosque con frecuencia. ¿Qué le gusta? Le gusta ________ (ANDAR) en el bosque.

6. La mamá cree que las hermanas son muy generosas con sus amigas. ¿Qué cree la mamá? Cree que las hermanas ________ (CUIDAR) los otros niños bien.

7. Las hermanas aprenden mucho cuando juegan con sus amigas. ¿Qué hacen las hermanas? Aprenden mucho ________ (JUGAR) con sus amigos.


9. Juanito cree que se va a poner muy triste al llegar al campamento. ¿Qué le preocupa? Tiene miedo de ________ ( LLORAR).

10. La mamá se preocupa porque Juanito no sabe nadar bien. ¿Qué no sabe la mamá? No sabe si hay personas que ________ (NADAR) con Juanito.

11. Juanito habla mucho con las hermanas. ¿Qué le gusta? Le gusta ________ (PASAR) tiempo con ellas.

12. Los tres hermanos tienen muy buena relación. ¿Qué cree la mamá? Cree que las hermanas ________ (AMAR) Juanito.


15. Juanito siempre canta cuando está en casa. Normalmente es tímido, pero no tiene miedo de cantar. ¡Qué dice Juanito? *Dice que _________ (CANTAR) con los amigos es muy divertido.*

16. Las hermanas disfrutan de bailar. Todos los campamentos tienen clases de baile. ¿Qué sabe la mamá? *Sabe que hay personas que _________ (BAILAR) en el campamento.*

17. Las hermanas son muy inteligentes. ¿Qué hacen las hermanas? *Aprenden mucho _________ (PENSAR) sobre la vida.*

18. La mamá sabe que las hermanas juegan bien con los demás niños. ¿Qué cree la mamá? *Cree que las hermanas _________ (MIRAR) los amigos cuando juegan.*


20. Aunque se aman, a veces Sara y María pelean con su hermanito. ¿Qué quiere la mamá? *Quiere que las hermanas _________ (TRATAR) Juanito con respeto.*


22. La mamá se preocupa porque no sabe si Juanito va a tener amigos. ¿Qué no sabe la mamá? *No sabe si hay personas que _________ (HABLAR) con Juanito.*

23. Si Juanito está triste, se pone a pensar. ¿Qué le gusta? *Le gusta _________ (PENSAR) sobre su familia.*

24. La mamá ve que las hermanas pintan muchas cosas en las clases de arte de su escuela. ¿Qué cree la mamá? *Cree que las hermanas _________ (PINTAR) su familia bien.*

25. Las hermanas hablan mucho con sus abuelos cuando necesitan consejos. ¿Qué hacen las hermanas? *Aprenden mucho _________ (HABLAR) con sus abuelos.*

26. La mamá sabe que Juanito no sabe nadar muy bien. Juanito se pondría feliz si sus hermanas lo miran mientras está en la piscina. ¿Qué quiere la mamá? *Quiere que las hermanas _________ (MIRAR) Juanito en la piscina.*

27. Juanito siempre quiere aprender nuevas cosas. ¿Qué dice Juanito? *Dice que _________ (BUSCAR) nuevos pasatiempos es muy divertido.*

28. Juanito tiene miedo de la piscina. Si juega con los amigos, se va a divertir mucho. ¿Qué sabe la mamá? *Sabe que hay personas que _________ (JUGAR) con Juanito en la piscina.*
29. Juanito habla mucho cuando se pone nervioso. ¿Qué le gusta? Le gusta _________
(CAMBIAR) de tema con frecuencia.

30. La mamá ve que las hermanas se divierten cuando están con sus amigos. ¿Qué cree la
mamá? Cree que las hermanas _________ (TRATAR) los otros niños bien.

31. Juanito es muy simpático y no provoca problemas con otros niños. ¿Qué le preocupa?
Tiene miedo de _________ (CAUSAR) problemas.

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

33. Cuando está estresado, Juanito juega en la computadora. ¿Qué dice Juanito? Dice que
_________ (USAR) la computadora es muy divertido.

34. Juanito tiene miedo de alturas y la mamá se preocupa porque cree que va a tener miedo
si sube el tobogán. ¿Qué no sabe la mamá? No sabe si hay personas que _________
(BAJAR) con Juanito.

35. Juanito es muy creativo y dibuja bien. ¿Qué le gusta? Le gusta _________ (CREAR)
nuevos dibujos.

36. La mamá sabe que las hermanas usan sus móviles para hablar con sus amigas. ¿Qué
cree la mamá? Cree que las hermanas _________ (LLAMAR) muchos amigos todos los
días.

37. Hay muchas cosas que Juanito no come. ¿Qué le preocupa? Juanito tiene miedo de
_________ (PROBAR) nuevas comidas.

38. La mamá sabe que el amor entre los hermanos es bien importante. ¿Qué quiere la
mamá? Quiere que las hermanas _________ (AMAR) Juanito.

39. Juanito habla mucho con las personas de confianza. ¿Qué dice Juanito? Dice que
_________ (CHARLAR) con los amigos es muy divertido.

40. Juanito quiere hablar con las personas. No quiere estar solito. ¿Qué sabe la mamá? Sabe
que hay personas que _________ (CHARLAR) con Juanito durante el día.

41. Juanito es muy musical. ¿Qué le gusta? Le gusta _________ (TOCAR) la guitarra.

42. En general, la mamá sólo tiene una regla para sus hijas. ¿Qué quiere la mamá? Quiere
que las hermanas _________ (CUIDAR) Juanito mientras está lejos de casa.

43. Juanito está preocupado porque no sabe si los otros niños van a saber usar los barcos
en el lago. ¿Qué le preocupa? Tiene miedo de _________ (REMAR) el barco.
44. La mamá quiere saber que Juanito está bien en su residencia. *No sabe si hay personas que ________ (ENTRAR) en el dormitorio con Juanito.*

45. Juanito es un niño muy gracioso. ¿Qué dice Juanito? * Dice que ________ (MIRAR) películas de comedia es muy divertido.*

46. Las hermanas son buenas artistas y se expresan mucho con el arte. ¿Qué hacen las hermanas? *Aprenden mucho ________ (PINTAR) en la clase de arte.*

47. Por último, Juanito es muy puntual. ¿Qué le gusta? *Le gusta ________ (LLEGAR) temprano.*
APPENDIX E: Transcript of Children’s Elicited Production Task

Note: The number in brackets indicates the corresponding stimulus on the full version of the FCT shown in Appendix D.

[2] 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.*


[10] La mamá se preocupa porque Juanito no sabe nadar bien. ¿Qué no sabe la mamá? *No sabe si hay personas que _________ (NADAR) con Juanito.*

[12] Los tres hermanos tienen muy buena relación. ¿Qué cree la mamá? *Cree que las hermanas _________ (AMAR) Juanito.*


[16] Las hermanas disfrutan de bailar. Todos los campamentos tienen clases de baile. ¿Qué sabe la mamá? *Sabe que hay personas que _________ (BAILAR) en el campamento.*

[20] Aunque se aman, a veces Sara y María pelean con su hermanito. ¿Qué quiere la mamá? *Quiere que las hermanas _________ (TRATAR) Juanito con respeto.*

[22] La mamá se preocupa porque no sabe si Juanito va a tener amigos. ¿Qué no sabe la mamá? *No sabe si hay personas que _________ (HABLAR) con Juanito.*

[24] La mamá ve que las hermanas pintan muchas cosas en las clases de arte de su escuela. ¿Qué cree la mamá? *Cree que las hermanas _________ (PINTAR) su familia bien.*

[26] La mamá sabe que Juanito no sabe nadar muy bien. Juanito se pondría feliz si sus hermanas lo miran mientras está en la piscina. ¿Qué quiere la mamá? *Quiere que las hermanas _________ (MIRAR) Juanito en la piscina.*


[34] Juanito tiene miedo de alturas y la mamá se preocupa porque cree que va a tener miedo si sube el tobogán. ¿Qué no sabe la mamá? *No sabe si hay personas que _________ (BAJAR) con Juanito.*
La mamá sabe que el amor entre los hermanos es bien importante. ¿Qué quiere la mamá? *Quiere que las hermanas ________ (AMAR) Juanito.*

Juanito quiere hablar con las personas. No quiere estar solito. ¿Qué sabe la mamá? *Sabe que hay personas que ________ (CHARLAR) con Juanito durante el día.*

En general, la mamá sólo tiene una regla para sus hijas. ¿Qué quiere la mamá? *Quiere que las hermanas ________ (CUIDAR) Juanito mientras está lejos de casa.*

La mamá quiere saber que Juanito está bien en su residencia. *No sabe si hay personas que ________ (ENTRAR) en el dormitorio con Juanito.*
APPENDIX F: Transcript of Full Adult Forced Choice Task

1. Juanito está muy emocionado porque puede disfrutar de la naturaleza en el campamento. ¿Qué dice Juanito?
   a. Dice que buscar animales en el bosque es muy divertido.
   b. Dice que buscando animales en el bosque es muy divertido.

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

3. ¿Qué tienen que hacer las hermanas?
   a. Tienen que mirar Juanito mientras hablan con él.
   b. Tienen que mirar a Juanito mientras hablan con él.

4. Juanito es muy puntual. ¿Qué le gusta?
   a. Le gusta llegando antes de todos.
   b. Le gusta llegar antes de todos.

5. La mamá dice que las hermanas siempre quieren cenar con Juanito. ¿Qué sabe la mamá?
   a. Sabe que hay personas que cenan con Juanito.
   b. Sabe que hay personas que cenan con Juanito.

6. Las hermanas son buenas con la conversación. ¿Qué aprenden las hermanas?
   a. Aprenden mucho hablar con la gente.
   b. Aprenden mucho hablando con la gente.

7. Juanito es muy respetuoso y no quiere problemas en el campamento. ¿Qué le preocupa?
   a. Tiene miedo de causar un problema en el campamento.
   b. Tiene miedo de causando un problema en el campamento.

8. Las hermanas no tienen miedo ninguno de alturas y siempre se tiran al agua en la piscina. ¿Qué cree la mamá?
   a. Cree que las hermanas saltan al agua.
   b. Cree que las hermanas salten al agua.

9. Juanito siempre habla sobre el teatro. ¿Qué dice Juanito?
   a. Dice que actuando en los espectáculos es muy divertido.
   b. Dice que actuar en los espectáculos es muy divertido.

10. La mamá sabe que Juanito tiene miedo de alturas. No quiere subir al tobogán en el parque de juegos solito. ¿Qué quiere la mamá?
a. Quiere que las hermanas lo lleven para subir al tobogán.
b. Quiere que las hermanas lo lleven para subir al tobogán.

11. ¿Qué tienen que hacer las hermanas?
   a. Tienen que llevar a Juanito para subir al tobogán.
   b. Tienen que llevar Juanito para subir al tobogán.

12. Juanito es muy creativo y quiere mandar cartas a casa. ¿Qué le gusta?
   a. Le gusta crear cartas para mandar a su casa.
   b. Le gusta creando cartas para mandar a su casa.

13. Si las hermanas no están con Juanito, la mamá no sabe si Juanito quiere bajar el tobogán solo. ¿Qué no sabe la mamá?
   a. No sabe si hay personas que bajan el tobogán con Juanito.
   b. No sabe si hay personas que bajen el tobogán con Juanito.

14. Juanito se pone muy callado cuando está preocupado. ¿Qué le preocupa?
   a. Juanito tiene miedo de hablando cuando está preocupado.
   b. Juanito tiene miedo de hablar cuando está preocupado.

15. Las hermanas se vistén solas. ¿Qué cree la mamá?
   a. Cree que las hermanas aten bien sus cordones.
   b. Cree que las hermanas atan bien sus cordones.

16. Cada noche, Juanito va a mirar el cielo porque le gustan las estrellas. ¿Qué dice Juanito?
   a. Dice que mirar las estrellas es muy divertido.
   b. Dice que mirando las estrellas es muy divertido.

17. Juanito siempre lleva gel en su pelo. ¿Qué quiere la mamá?
   a. Quiere que las hermanas lo peinen cada mañana.
   b. Quiere que las hermanas lo peinen cada mañana.

18. ¿Qué tienen que hacer las hermanas?
   a. Tienen que peinar Juanito cada mañana.
   b. Tienen que peinar a Juanito cada mañana.

19. Juanito se disfraza mucho porque cree que es divertido. ¿Qué le gusta?
   a. Le gusta cambiando de ropajes.
   b. Le gusta cambiar de ropajes.

20. La mamá siempre habla con Juanito mientras come. Hay muchas personas con las que puede hablar en el campamento. ¿Qué sabe la mamá?
   a. Sabe que hay personas que charlan con Juanito mientras come.
   b. Sabe que hay personas que charlen con Juanito mientras come.
21. Las hermanas son muy competitivas. ¿Qué aprenden las hermanas?
   a. Las hermanas aprenden mucho jugando con sus amigas.
   b. Las hermanas aprenden mucho jugar con sus amigas.

22. A veces Juanito quiere seguir la misma rutina. ¿Qué le preocupa?
   a. Le preocupa probar nuevas actividades.
   b. Le preocupa probando nuevas actividades.

23. Las hermanas se emocionan mucho. A veces son muy ruidosas. ¿Qué cree la mamá?
   a. Cree que las hermanas gritan cuando se emocionan.
   b. Cree que las hermanas griten cuando se emocionan.

24. Juanito siempre habla con las hermanas. ¿Qué dice Juanito?
   a. Dice que charlando con sus hermanas es muy divertido.
   b. Dice que charlar con sus hermanas es muy divertido.

25. Juanito se pone feliz si las hermanas le prestan atención. ¿Qué quiere la mamá?
   a. Quiere que las hermanas lo llamen cada día.
   b. Quiere que las hermanas lo llamen cada día.

26. ¿Qué tienen que hacer las hermanas?
   a. Tienen que llamar a Juanito cada día.
   b. Tienen que llamar Juanito cada día.

27. Juanito siempre disfruta de mirar el agua, aunque no nada bien. ¿Qué le gusta?
   a. Le gusta andar al lado del agua.
   b. Le gusta andando al lado del agua.

28. Si Juanito está en el campamento y se siente solo, necesita hablar con otras personas. ¿Qué no sabe la mamá?
   a. No sabe si hay personas que hablen con Juanito.
   b. No sabe si hay personas que hablan con Juanito.

29. Juanito es muy humilde y no piensa ganar si juega con sus compañeros. ¿Qué le preocupa?
   a. Tiene miedo de ganando si juega con sus compañeros del campamento.
   b. Tiene miedo de ganar si juega con sus compañeros del campamento.

30. A veces las hermanas no hablan con los adultos porque usan sus móviles. ¿Qué cree la mamá?
   a. Cree que las hermanas usen sus móviles demasiado.
   b. Cree que las hermanas usan sus móviles demasiado.

31. Juanito juega con el móvil de su padre con frecuencia. ¿Qué dice Juanito?
   a. Dice que usar el móvil de otra persona es muy divertido.
   b. Dice que usando el móvil de otra persona es muy divertido.
32. La mamá cree que Juanito puede preocuparse mucho. ¿Qué quiere la mamá?
   a. Quiere que las hermanas lo cuiden.
   b. Quiere que las hermanas lo cuiden.

33. ¿Qué tienen que hacer las hermanas?
   a. Tienen que cuidar Juanito.
   b. Tienen que cuidar a Juanito.

34. Juanito dice que le importa mucho su familia. ¿Qué le gusta?
   a. Le gusta pasando tiempo con la familia.
   b. Le gusta pasar tiempo con la familia.

35. Todos los campamentos tienen clases de baile, porque muchos niños quieren bailar. ¿Qué sabe la mamá?
   a. Sabe que hay personas que bailen con Juanito.
   b. Sabe que hay personas que bailan con Juanito.

36. Las hermanas son responsables y cuidan de Juanito. ¿Qué aprenden las hermanas?
   a. Aprenden mucho cuidando de Juanito.
   b. Aprenden mucho cuidar de Juanito.

37. Juanito puede hacerse daño si levanta cosas muy pesadas al llegar al campamento. ¿Qué le preocupa?
   a. Tiene miedo de llevar la mochila si está muy llena.
   b. Tiene miedo de llevando la mochila si está muy llena.

38. Las hermanas también bailan y cantan. ¿Qué cree la mamá?
   a. Cree que las hermanas bailan muy bien.
   b. Cree que las hermanas bailen muy bien.

39. Juanito disfruta de los cuentos de hadas. ¿Qué dice Juanito?
   a. Dice que contando cuentos de hadas es muy divertido.
   b. Dice que contar cuentos de hadas es muy divertido.

40. Las hermanas pintan mucho y la mamá cree que Juanito quiere un retrato. ¿Qué quiere su mamá?
   a. Quiere que las hermanas lo pintent.
   b. Quiere que las hermanas lo pinten.

41. ¿Qué tienen que hacer las hermanas?
   a. Las hermanas tienen que pintar a Juanito.
   b. Las hermanas tienen que pintar Juanito.

42. Juanito es muy científico y siempre está pensando. ¿Qué le gusta?
   a. Le gusta pensar en nuevos inventos.
b. Le gusta pensando en nuevos inventos.

43. Juanito está preocupado porque no nada con mucha confianza. La mamá no sabe que los campamentos tienen profesores de natación. ¿Qué no sabe la mamá?
   a. No sabe si hay personas que nadan con Juanito en el campamento.
   b. No sabe si hay personas que naden con Juanito en el campamento.

44. Juanito también se preocupa porque normalmente hay lagos en los campamentos. ¿Qué le preocupa?
   a. Tiene miedo de remando solo en el barco.
   b. Tiene miedo de remar solo en el barco.

45. La mamá insiste en el buen trato de su niño. ¿Qué quiere la mamá?
   a. Quiere que las hermanas lo traten con cariño.
   b. Quiere que las hermanas lo traten con cariño.

46. ¿Qué tienen que hacer las hermanas?
   a. Tienen que tratar Juanito bien.
   b. Tienen que tratar a Juanito bien.

47. Juanito es muy buen cantante. ¿Qué dice Juanito?
   a. Dice que cantar una canción nueva es muy divertido.
   b. Dice que cantando una canción nueva es muy divertido.

48. La mamá ve que las hermanas siempre se divierten juntas. ¿Qué cree la mamá?
   a. Cree que las hermanas juegan bien juntas.
   b. Cree que las hermanas jueguen bien juntas.

49. Juanito siempre está contento si está con los animales. ¿Qué le gusta?
   a. Le gusta tocando los animales que viven en el campamento.
   b. Le gusta tocar los animales que viven en el campamento.

50. Juanito juega muchos juegos de mesa. Es muy popular jugarlos en el campamento todas las tardes. ¿Qué sabe la mamá?
   a. Sabe que hay niños que juegan con Juanito en la residencia.
   b. Sabe que hay niños que juegan con Juanito en la residencia.

51. Las hermanas miran mucho la televisión. ¿Qué hacen las hermanas?
   a. Aprenden mucho mirar la televisión.
   b. Aprenden mucho mirando la televisión.

52. Juanito tiene miedo de las tormentas. ¿Qué le preocupa?
   a. Tiene miedo de llorar si hay una tormenta.
   b. Tiene miedo de llorando si hay una tormenta.
53. La mamá cree que Juanito tiene miedo de estar solo si hay tormentas. Como va a estar en el campamento, va a haber otros niños con él también. ¿Qué no sabe la mamá?
   a. No sabe si hay personas que entren en la residencia con Juanito si hay tormentas.
   b. No sabe si hay personas que entran en la residencia con Juanito si hay tormentas.

54. En general, sólo hay una cosa que es muy importante para Juanito. ¿Qué quiere la mamá?
   a. Quiere que las hermanas lo amen.
   b. Quiere que las hermanas lo aman.

55. ¿Qué tienen que hacer las hermanas?
   a. Tienen que amar a Juanito.
   b. Tienen que amar Juanito.
APPENDIX G: Transcript of Children’s Forced Choice Task

Note: The number in brackets indicates the corresponding stimulus on the full version of the FCT shown in Appendix F.

[2] La mamá sabe que las hermanas no siempre hablan con Juanito. ¿Qué quiere la mamá?
   a. Quiere que las hermanas lo miran cuando hablan con él.
   b. Quiere que las hermanas lo miren cuando hablan con él.

[3] ¿Qué tienen que hacer las hermanas?
   a. Tienen que mirar Juanito mientras hablan con él.
   b. Tienen que mirar a Juanito mientras hablan con él.

[8] Las hermanas no tienen miedo ninguno de alturas y siempre se tiran al agua en la piscina. ¿Qué cree la mamá?
   a. Cree que las hermanas saltan al agua.
   b. Cree que las hermanas salten al agua.

[10] La mamá sabe que Juanito tiene miedo de alturas. No quiere subir al tobogán en el parque de juegos solito. ¿Qué quiere la mamá?
   a. Quiere que las hermanas lo lleven para subir al tobogán.
   b. Quiere que las hermanas lo lleven para subir al tobogán.

[11] ¿Qué tienen que hacer las hermanas?
   a. Tienen que llevar a Juanito para subir al tobogán.
   b. Tienen que llevar Juanito para subir al tobogán.

[13] Si las hermanas no están con Juanito, la mamá no sabe si Juanito quiere bajar el tobogán solo. ¿Qué no sabe la mamá?
   a. No sabe si hay personas que bajan el tobogán con Juanito.
   b. No sabe si hay personas que bajen el tobogán con Juanito.

[17] Juanito siempre lleva gel en su pelo. ¿Qué quiere la mamá?
   a. Quiere que las hermanas lo peinan cada mañana.
   b. Quiere que las hermanas lo peinen cada mañana.

[18] ¿Qué tienen que hacer las hermanas?
   a. Tienen que peinar Juanito cada mañana.
   b. Tienen que peinar a Juanito cada mañana.

[23] Las hermanas se emocionan mucho. A veces son muy ruidosas. ¿Qué cree la mamá?
   a. Cree que las hermanas gritan cuando se emocionan.
   b. Cree que las hermanas giten cuando se emocionan.
Juanito se pone feliz si las hermanas le prestan atención. ¿Qué quiere la mamá?
   a. Quiere que las hermanas lo llamen cada día.
   b. Quiere que las hermanas lo llamen cada día.

¿Qué tienen que hacer las hermanas?
   a. Tienen que llamar a Juanito cada día.
   b. Tienen que llamar Juanito cada día.

Si Juanito está en el campamento y se siente solo, necesita hablar con otras personas. ¿Qué no sabe la mamá?
   a. No sabe si hay personas que hablen con Juanito.
   b. No sabe si hay personas que hablan con Juanito.

La mamá cree que Juanito puede preocuparse mucho. ¿Qué quiere la mamá?
   a. Quiere que las hermanas lo cuidan.
   b. Quiere que las hermanas lo cuiden.

¿Qué tienen que hacer las hermanas?
   a. Tienen que cuidar Juanito.
   b. Tienen que cuidar a Juanito.

Las hermanas también bailan y cantan. ¿Qué cree la mamá?
   a. Cree que las hermanas bailan muy bien.
   b. Cree que las hermanas bailen muy bien.

Las hermanas pintan mucho y la mamá cree que Juanito quiere un retrato. ¿Qué quiere su mamá?
   a. Quiere que las hermanas lo pinten.
   b. Quiere que las hermanas lo pintan.

¿Qué tienen que hacer las hermanas?
   a. Las hermanas tienen que pintar a Juanito.
   b. Las hermanas tienen que pintar Juanito.

Juanito está preocupado porque no nada con mucha confianza. La mamá no sabe que los campamentos tienen profesores de natación. ¿Qué no sabe la mamá?
   a. No sabe si hay personas que nadan con Juanito en el campamento.
   b. No sabe si hay personas que naden con Juanito en el campamento.

La mamá insiste en el buen trato de su niño. ¿Qué quiere la mamá?
   a. Quiere que las hermanas lo tratan con cariño.
   b. Quiere que las hermanas lo traten con cariño.

¿Qué tienen que hacer las hermanas?
a. Tienen que tratar Juanito bien.
b. Tienen que tratar a Juanito bien.

[53] La mamá cree que Juanito tiene miedo de estar solo si hay tormentas. Como va a estar en el campamento, va a haber otros niños con él también. ¿Qué no sabe la mamá?
   a. No sabe si hay personas que entren en la residencia con Juanito si hay tormentas.
   b. No sabe si hay personas que entran en la residencia con Juanito si hay tormentas.

[54] En general, sólo hay una cosa que es muy importante para Juanito. ¿Qué quiere la mamá?
   a. Quiere que las hermanas lo amen.
   b. Quiere que las hermanas lo aman.

[55] ¿Qué tienen que hacer las hermanas?
   a. Tienen que amar a Juanito.
   b. Tienen que amar Juanito.