UNIVERSITÉ FRANÇOIS - RABELAIS DE TOURS

ÉCOLE DOCTORALE Santé, Sciences, Technologies

INSERM U930 Imagerie et Cerveau

THÈSE présentée par :

Maureen SCHEIDNES

soutenue le : **6 février 2012**

pour obtenir le grade de : **Docteur de l'Université François - Rabelais**

Discipline/ Spécialité : Linguistique

L'acquisition du français L2 chez l'enfant :
Développement typique versus atypique

THÈSE dirigée par :

Mme TULLER Laurice	Professeure, Université François – Rabelais – Tours

RAPPORTEURS :

Mme HULK Aafke	Professeure, Université d'Amsterdam – Pays-Bas
M. MARINIS Theodoros	Reader, Université de Reading – Royaume-Uni

---

JURY :

Mme HULK Aafke	Professeure, Université d'Amsterdam – Pays-Bas
M. MARINIS Theodoros	Reader, Université de Reading – Royaume-Uni
M. PREVOST Philippe	Professeur, Université François – Rabelais – Tours
Mme TULLER Laurice	Professeure, Université François – Rabelais – Tours

To my grandparents, Joseph Scheidnes Sr., Millie Wolkerstorfer, Mary Jane Munsch, and George William Byron,

I stand on your shoulders.

Remerciements

My life has been blessed by the presence and support of so many amazing people. I would like to take a moment here to acknowledge their contribution to this dissertation.

First and foremost, I would like to thank the children and parents who participated in this study. Thank you for welcoming me and my colleagues into your homes with such warmth and enthusiasm. Thank you to the children for playing our games and for talking to us about your lives. A big thank you goes out to the parents for their patience and cooperation in sorting out logistics.

I would like to thank Laurie Tuller, directrice extraordinaire, for giving me the opportunity to be part of such a fulfilling project. I am forever grateful for her insight, patience and guidance.

Un merci tout particulier à Philippe Prévost, qui a accepté de me transmettre ses remarques, riches de toute son expertise, sur mon travail. Je lui suis sincèrement reconnaissante pour cela.

Je remercie très chaleureusement les directeurs des écoles, les enseignants, et les cliniciens pour leur aide dans le recrutement et de l'intérêt qu'ils ont porté à notre projet.

I would like to thank the members of my PhD committee, Aafke Hulk, Johanne Paradis, Philippe Prévost and Theo Marinis for agreeing to play a crucial role in this dissertation.

Merci à tous les enseignants du Groupe langage : Sandrine Ferré, Martin Haiden, Christophe Dos Santos, Cécile Monjauze, Rasha Zebib, Hélène Delage et aux étudiantes Eléonore Morin, Chloé Berruer, Claire Damourette, Mélanie Aillet, Aline Vanhaverbeke, Lucile Dupuy, Servane Galès, Sabrina Delord, Sarah Black, Camille Ternisien, Anna Filinova, Nohad Abou Melhelm, Nolwen Brunie pour leur soutien, leurs conseils et leur aide dans la collecte et dans l'analyse des données.

I am grateful to those involved in the COST Action IS0804, especially to Theo Marinis and Vicky Chondrogianni for hosting my STSM project, and to Sharon Armon-Lotem and Natalia Meir for all of their hard work.

Je remercie tous les membres de l'équipe 1 de l'unité INSERM U930 qui m'ont accompagné au fil de ce travail. Je remercie tout particulièrement Rémy Magné et Sylvie Roux pour leur travail indispensable au fonctionnement de l'équipe et Laëtitia Roché d'avoir représenté les doctorants au sein de l'équipe.

Je remercie l'Agence Nationale pour la Recherche de son intérêt et de son soutien financier pour la réalisation de ce travail.

Merci à Roselyne Barboteau, Dominique Moreau, Jacqueline Rozas et Isabelle Ansault de m'avoir guidé administrativement et d'avoir toujours répondu à mes innombrables questions.

To the folks at GRETA Touraine: Sylvie, Adam, Steve, Esther, Nadine, Eva, and Soledad, I'd work with you again in a heartbeat.

A Charles Madeline, de m'avoir montré des utilisations encore plus intéressantes des enregistreurs numériques.

Je remercie du fond du cœur Eléonore Morin et Rasha Zebib pour leur aide immense et précieuse. Merci de m'avoir remonté le moral quand j'en avais besoin. Ouf que j'ai fini. I owe you big time.

A big thank you goes out to Jane, Joe, Ellen for their proofreading skills.

Un grand merci à Solange, Noël, Sophie et JC qui m'ont soutenue de près ou de loin.

I am very thankful to my entire extended family for their support, encouragement and presence in my life.

To my dear friends Stephanie Huss, Christa Mardaus, Shannon Skrypek, and Slovic and Karen Nissen-Boryczka, thank you for reminding me of the importance of perseverance and laughter, and for showing me what it means to be tough.

I would like to thank my parents, Jane and Joe, for their encouragement, support and for the many homemade Happy Thesis cards they sent. I would also like to thank my brothers, Tom and John, who always know how to make me laugh.

Enfin, merci à Nico et merci au Cactus.

Résumé

Des recherches antérieures comparant les enfants typiques qui acquièrent une langue seconde (enfant L2) à des enfants monolingues avec trouble spécifique du langage (TSL) ont montré de fortes similarités entre les performances linguistiques des deux groupes. Par ailleurs, jusqu'à récemment, la recherche en acquisition L2 s'est fortement concentrée sur les apprenants adultes, et donc, il existe relativement peu d'informations à propos des trajectoires développementales chez l'enfant L2 sain. Ces similarités avec les enfants SLI et la pénurie d'informations concernant le développement L2 chez l'enfant typique créent un contexte dans lequel l'identification du trouble du langage chez les enfants L2 risque de ne pas être adéquate. En effet, un enfant L2 typique risque d'être sur-diagnostiqué d'un trouble du langage ou bien un enfant L2 avec TSL risque d'avoir ses difficultés langagières attribuées à son acquisition L2. Un aspect du développement L2 enfantin qui a été peu exploré concerne l'impact de la complexité computationnelle sur la performance linguistique. Bien que plusieurs études antérieures aient mis en évidence des stratégies d'évitement des propositions enchâssées chez les enfants avec TSL, seulement un nombre très réduit d'études se sont intéressées au développement de l'enchâssement, une opération syntaxique impliquant une certaine complexité, chez les enfants L2 ordinaires.

L'objectif général de cette étude est donc de contribuer à l'état de connaissance du développement L2 enfantin à travers l'analyse longitudinale de l'enchâssement propositionnel et des erreurs morphosyntaxiques dans le langage spontané d'un groupe de 22 enfants anglophones âgés de 6;9 à 12;7 à T1 (*M* = 9;8, *SD* = 1;9) qui acquièrent le français dans un contexte naturel. Les enfants L2 ont été comparés à un groupe d'enfants avec SLI âgés de 6;5 à 12;11 à T1 (*M* = 9;9, *SD* = 1;11). Des mesures standardisées ainsi que l'analyse de trois propriétés morphosyntaxiques dans le langage spontané (la flexion verbale, les clitiques objet, et le genre grammatical) ont également été analysées. Une attention particulière a été prêtée aux rôles des facteurs qui sont supposés influencer l'acquisition L2 : l'âge chronologique, l'âge de début d'exposition à la L2, et la durée d'exposition à la L2.

Les résultats ont révélé que les enfants L2 utilisent l'enchâssement propositionnel plus fréquemment dans le langage spontané que les enfants avec SLI. En revanche, les enfants L2 et SLI ont eu des performances comparables concernant le taux d'erreurs morphosyntaxiques, le taux de morphologie verbale correcte et le taux de production de clitiques objets. Concernant le genre grammatical, les enfants L2 ont eu des performances significativement plus faibles comparés aux enfants avec SLI, surtout en ce qui concerne l'article indéfini. De façon remarquable, l'analyse des corrélations entre la fréquence d'enchâssement et le taux d'erreurs ont mis en évidence deux profiles développementaux différents. En effet, la corrélation entre ces deux mesures est négative chez les enfants avec SLI et positive chez les enfants L2. La durée d'exposition à la L2 a été corrélée de façon significative avec les erreurs morphosyntaxiques, mais la même association n'a pas été observée entre la durée d'exposition et le taux d'enchâssement chez les enfants L2. Ces résultats amènent à la postulation de la production cible (pour l'âge) de l'enchâssement syntaxique comme outil permettant de distinguer le développement L2 typique chez l'enfant du développement L2 atypique.

Mots clés : acquisition L2 enfantine, trouble spécifique du langage (TSL), complexité syntaxique, propositions enchâssées, diagnostic différentiel

Résumé en anglais

Prior comparative research on typically-developing children acquiring a second language (L2 children) and monolingual children with SLI has revealed strong similarities in the morphosyntactic performance of these two learner groups. Moreover, research on L2 acquisition has largely focused on adult populations, and therefore, relatively little is known about typical developmental paths in child L2 acquisition. Because L2 child profiles overlap with the clinical population and because there is currently insufficient knowledge about typical child L2 development, L2 children run the risk of being either over- or under-identified for language impairment. One aspect of child L2 development that has yet to be thoroughly investigated is the impact of computational complexity on language performance. Although previous studies have shown that children with SLI tend to avoid subordinate clauses, only a small number of studies have investigated the development of clausal embedding, an arguably complex structure, in L2 children.

The general objective of this thesis is therefore to contribute to the knowledge of child L2 development through the longitudinal analysis of clausal embedding and overall morphosyntactic error rates in the spontaneous language of a group of 22 English-speaking children (aged 6;9 - 12;7; *M* = 9;8, *SD* = 1;9 at T1) who are acquiring French in a natural setting. The L2 children were compared to a group of aged-matched L1 French-speaking children with SLI (aged 6;5 - 12;11; *M* = 9;9, *SD* = 1;11 at T1). Additional points of comparison between these two learner groups included standardized tests (phonology, morphosyntax, and working memory) and rates of accuracy in verb morphology, object clitics and gender agreement in spontaneous speech. Particular attention was paid to the role of length of exposure, age of onset, and chronological age in the L2 group's performance.

The results revealed that L2 children used clausal embedding more often than the children with SLI. However, the SLI and L2 groups patterned together in terms of general error rates and more or less in terms of verb morphology and object clitics. However, the L2 children were significantly less accurate on gender agreement than the children with SLI, especially on the indefinite determiner. Interestingly, analyses of the frequency of embedding and errors revealed correlations that were positive in the L2 group and negative in the SLI. The length of exposure factor in the L2 group was more closely linked with error rates than embedding. The discussion of these results focuses on the implications of these findings for the identification of SLI in L2 children. The hypothesis is advanced that the production of clausal embedding can be used to distinguish typical from atypical development in L2 children.

Keywords: child L2 acquisition, SLI, clausal embedding, morphosyntactic accuracy

Table des matières

Remerciements 3

Résumé 5

Résumé en anglais 7

1 Introduction 17

1.1 Introduction (French) 17

1.2 Introduction (English) 23

2 Understanding L2 Acquisition 30

2.1 Introduction 30

2.2 Defining Child L2 Acquisition 31

2.2.1 Child L2 and the Critical Period Hypothesis 32

2.2.2 Ultimate Attainment and Development 33

2.2.3 Theoretical Approaches to Child L2 33

2.3 Morphosyntactic Properties in Child L2 Development 36

2.3.1 Verb Morphology 36

2.3.1.1 Morpheme order approaches 36

2.3.1.2 Verb morphology in child L2 French 37

2.3.1.3 Verb morphology in child L2 English 45

2.3.2 Object clitics 48

2.3.2.1 White (1996) 49

2.3.2.2 Belletti & Hamann (2004) 50

2.3.2.3 Haiden (2011) 50

2.3.2.4 Chondrogianni (2008) 52

2.3.3 Gender 54

2.3.3.1 Grondin & White (1996) 54

2.3.3.2 Meisel (2009) 54

2.3.3.3 Granfeldt et al. (2007) 55

2.3.3.4 Hulk (2007) and Unsworth (2008) 55

2.3.3.5 Gathercole (2002) 57

2.3.3.6 The Role of L1 Transfer in the Acquisition of Gender 59

2.3.4 Syntactic Structures in Child L2 Development 61

2.3.4.1 Emergence of CP in L2 child French 61

2.3.4.2 Emergence of CP in L2 child English 62

2.3.4.3 Pearson (2002): Clausal embedding in narratives 64
2.3.4.4 Marinis (2007): Passives 66
2.3.4.5 Unsworth (2005): Scrambling in L2 Dutch 68
2.4 Factors in L2 Acquisition 71
2.4.1 Age of Onset 71
2.4.1.1 Age of onset and verb morphology 72
2.4.1.2 Age of onset and object clitics 75
2.4.1.3 Age of onset and gender 76
2.4.1.4 Age of onset and syntactic structures 77
2.4.2 LoE 79
2.4.2.1 LoE and verb morphology 79
2.4.2.2 LoE and object clitics 81
2.4.2.3 LoE and gender 82
2.4.2.4 LoE and syntactic structures 82
2.4.3 Quantity and Quality of Input 83
2.4.3.1 Quantity and quality of input and verb morphology 83
2.4.3.2 Quantity and quality of input and gender 85
2.4.3.3 Quantity and quality of input and syntactic structures 86
2.4.4 Chronological Age (CA) 87
2.5 Conclusion 88
3 Computational Complexity and the SLI Perspective 91
3.1 Introduction 91
3.2 What is SLI? 91
3.2.1 Definition and diagnostics 91
3.2.2 Subtypes 95
3.2.3 Persistence 96
3.3 Clinical Markers 96
3.3.1 Tense-marking 97
3.3.2 Object clitics 100
3.3.3 Gender 102
3.4 Underlying Nature of SLI 105
3.4.1 Domain-general Hypotheses 105
3.4.2 Domain-specific Hypotheses 106

3.4.3 Interaction between the Language Module and Performance Systems 109
3.4.3.1 SLI and the Derivational Complexity Hypothesis 110
3.4.3.2 (Avoidance of) complexity in spontaneous speech 112
3.4.3.3 Morphosyntactic errors and complexity 115
3.5 Conclusion 117
4 Comparing L2 Children to Children with SLI 118
4.1 Introduction 118
4.2 Verb Morphology 119
4.2.1 Monolingual SLI and TD L2 119
4.2.1.1 Håkansson & Nettelbladt (1993, 1996) and Håkansson (2001) 119
4.2.1.2 Paradis & Crago (2000) 121
4.2.1.3 Paradis (2005) 125
4.2.1.4 Marinis & Chondrogianni (2010) 127
4.2.1.5 Paradis, Rice, Crago & Marquis (2008) 130
4.2.2 Bilingual SLI and TD L2 132
4.2.2.1 Paradis, Crago, Genesee & Rice (2003) 133
4.2.2.2 Orgassa (2009) 133
4.2.2.3 Armon-Lotem et al. (2007) 138
4.2.2.4 Gutiérrez-Clellen et al. (2008) 140
4.2.2.5 Paradis (2008) 143
4.3 Object Clitics 148
4.3.1 Monolingual SLI and TD L2 148
4.3.1.1 Paradis (2004) 148
4.3.1.2 Hamann & Belletti (2008) 150
4.3.1.3 Grüter (2005) 152
4.3.2 Simultaneous Bilingual and Monolingual SLI 154
4.3.2.1 Paradis, Crago & Genesee (2003) 154
4.3.2.2 Paradis et al. (2005/2006) 157
4.3.3 Gender 160
4.3.3.1 Paradis & Crago (2004) 160
4.3.3.2 Orgassa & Weerman (2008) 162
4.4 Syntactic Structures and Processing 167
4.4.1 Simon-Cereijido & Gutiérrez-Clellen (2007) 168

4.4.2 Prévost et al. (2010) ... 172
4.4.3 Kohnert et al. (2009) ... 177
4.5 Examining the Impact of L2 Factors on SLI-L2 Comparisons ... 179
4.6 Conclusion ... 181
5 A Way Forward for the SLI-L2 Comparison ... 183
5.1 Introduction ... 183
5.2 General SLI-L2 Research Agenda ... 183
5.3 Summary of Theoretical Approaches ... 185
5.3.1 Processing versus Representational Debate ... 185
5.3.2 Question of L1 Transfer ... 187
5.3.3 Integrated Approaches ... 189
5.3.4 Clausal embedding in L2 Children ... 192
5.4 Research Questions, Hypotheses and Predictions ... 193
5.4.1 Objectives ... 194
5.4.2 Research Questions ... 195
5.4.3 General Hypothesis and Predictions ... 196
5.5 Clausal Embedding and Verb Morphology in French Compared to English ... 198
5.5.1 Embedded Clauses ... 198
5.5.1.1 Adverbial clauses ... 198
5.5.1.2 Non-finite complement clauses ... 199
5.5.1.3 Finite complement clauses ... 201
5.5.1.4 Relative clauses ... 203
5.5.2 Measuring the Complexity of Embedded Clauses ... 207
5.5.3 Morphosyntactic Properties ... 208
5.5.3.1 Verb morphology ... 209
5.5.3.2 Clitics ... 214
5.5.3.3 Grammatical gender ... 221
5.6 Conclusion ... 226
6 Methodology ... 227
6.1 Introduction ... 227
6.2 Participants ... 227
6.2.1 L2 children ... 227
6.2.2 Children with SLI ... 231

6.2.3 L2 and SLI Age Groups 233
6.2.4 Control Population 235
6.3 Materials 236
6.3.1 Standardized Tools 236
6.3.1.1 Sentence completion 237
6.3.1.2 Word repetition 237
6.3.1.3 Digit Span 237
6.3.1.4 CELF-4 237
6.3.2 Procedure for Standardized Tests 238
6.3.3 Spontaneous Language 239
6.3.3.1 Data collection 239
6.3.3.2 Transcription 239
6.3.3.3 Coding and Measures 241
6.3.3.4 Accuracy and embedding measures 249
6.3.4 Statistics 249
7 Results 252
7.1 Introduction 252
7.2 Standardized Tests 252
7.2.1 Sentence Completion 253
7.2.2 Word Repetition 255
7.2.3 Digit Span (French) 256
7.2.4 Digit Span (English) 258
7.2.5 L1 Skills (CELF) 259
7.2.6 L2 Factors 261
7.2.6.1 LoE 261
7.2.6.2 AoO 262
7.2.6.3 Working Memory 262
7.2.6.4 L1 Skills 263
7.3 Spontaneous language results 265
7.3.1 MLU 265
7.3.1.1 MLU group results 265
7.3.1.2 MLU individual results 268
7.3.1.3 MLU and age groups 269

7.3.2 Clausal Embedding Measures 270
7.3.2.1 Clausal embedding group results 270
7.3.2.2 Clausal embedding measures individual results........ 273
7.3.2.3 Clausal embedding and age groups 276
7.3.3 Subordinate clause types 278
7.3.4 Interim Summary: MLU and Clausal Embedding Measures 285
7.3.5 Morphosyntactic Properties........ 286
7.3.5.1 Overall morphosyntactic accuracy 288
7.3.5.2 Verb morphology 290
7.3.5.3 Object clitics........ 309
7.3.5.4 Gender 314
7.3.6 Errors and Clausal Embedding........ 327
7.3.6.1 Rate of erroneous complex and erroneous simple utterances 327
7.3.6.2 Target relative clauses 331
7.3.6.3 Errors occurring in complex versus simple utterances........ 332
7.3.6.4 Correlations between embedding and errors 334
7.4 L2 Factors........ 340
7.4.1 LoE and Measures of Clausal Embedding 341
7.4.2 LoE and morphosyntactic properties........ 345
7.4.3 Age of Onset........ 348
7.4.4 Age of Onset and Clausal Embedding Measures 348
7.4.5 Age of Onset and Morphosyntactic Properties 349
7.4.6 L1 Skills 350
7.4.7 Working Memory........ 350
7.5 Interpretation of Clausal Embedding in Light of Measures Standardized Tests.... 351
7.6 Conclusion........ 356
8 Discussion 359
8.1 Introduction 359
8.2 Research Questions and Predictions Revisited 359
8.2.1 What is the Impact of Computational Complexity on Child L2 Development? 359
8.2.1.1 Evidence from clausal embedding 359
8.2.1.2 Evidence from the link between errors in morphosyntax and clausal embedding 362

8.2.1.3 Chronological age and LoE in the SLI and L2 comparison 364
8.2.2 L2 Factors 368
8.2.2.1 Impact of LoE on L2 performance 368
8.2.2.2 Impact of AoO on L2 performance 371
8.2.2.3 Impact of working memory on L2 performance 371
8.2.2.4 Impact of L1 skills on L2 performance 372
8.3 Delineation of healthy developmental paths in child L2 373
8.3.1 Frequency of embedding in L2 children 373
8.3.2 Morphosyntactic Accuracy 374
8.4 Remarks on Methodology 375
8.4.1 Clausal embedding and spontaneous language 375
8.4.2 Comparing spontaneous language and elicitation results 376
8.5 Conclusion 378
9 Conclusion 380
9.1 Conclusion (English) 380
9.2 Conclusion (French) 381
Bibliographie 386
Annexes 407
Annexe A Initial Language Profile 408
Annexe B Family Questionnaire 409
Résumé 414
Résumé en anglais 414

1 Introduction

1.1 Introduction (French)

Cette thèse est une étude comparative entre des enfants anglophones qui acquièrent le français comme langue seconde (enfants L2) et des enfants francophones monolingues présentant un trouble spécifique du langage (enfants avec TSL). Il s'agit d'une étude longitudinale s'appuyant sur les scores des enfants à des tests standardisés ainsi que sur une analyse de leur langage spontané (fréquence de subordination, production cible de flexions morphologiques, de pronoms clitiques objet et de genre).

Des études antérieures comparant des enfants L2 au développement typique à des enfants avec TSL appariés en âge ont révélé d'importantes similarités entre les performances linguistiques de ces deux groupes (Håkansson & Nettelbladt 1993, 1996; Paradis & Crago 2000, 2004; Grüter 2005). Dans le même temps, l'expansion de l'Union Européenne et l'augmentation conséquente de la migration à travers les pays d'Europe a abouti à une importante augmentation du nombre d'apprenants d'une langue seconde dans les écoles, ainsi qu'à une augmentation du nombre de ces enfants suivis en orthophonie. Cette augmentation, associée au chevauchement observé entre les profils des enfants L2 et ceux des enfants avec TSL, engendre des cas de sous-diagnostic ou de sur-diagnostic de TSL chez les enfants L2 (cf. Paradis 2005). Aussi, l'élaboration d'outils d'évaluation permettant aux cliniciens de distinguer les enfants L2 au développement typique des enfants L2 avec TSL devient une urgence.

Malgré le fait que les enfants L2 sont probablement aussi nombreux dans le monde que les enfants monolingues (Tucker 1998), les connaissances actuelles sur l'acquisition typique d'une langue seconde durant l'enfance demeurent beaucoup moins développées que celles concernant le développement du langage chez l'enfant monolingue. Une difficulté souvent relevée dans la littérature sur les enfants L2 concerne l'hétérogénéité retrouvée parmi ces enfants, hétérogénéité souvent liée aux différences interindividuelles quant à la quantité et à la qualité de l'input dans la langue seconde, à l'âge d'exposition à la L2, à l'âge chronologique, à la durée d'exposition à la L2, aux propriétés grammaticales de la L1, à la mémoire de travail et aux fonctions exécutives, au statut sociolinguistique de la L1, etc. (cf. Paradis, 2008). De plus, il est actuellement reconnu qu'il existe différentes voies normales et saines permettant l'acquisition réussie d'une langue seconde (Paradis, Genesee, & Crago 2011). Un des objectifs de cette étude est d'identifier et de décrire ces voies d'acquisition typique afin de les distinguer de celles liées à un trouble du langage. L'objectif ultime de cette thèse est alors de contribuer à la recherche sur la comparaison L2-TSL en essayant de mieux comprendre le développement typique d'une langue seconde. Cette comparaison L2-TSL est nécessaire pour identifier les caractéristiques linguistiques propres à chacun de ces deux groupes.

Le cadre théorique de cette thèse se base sur l'hypothèse selon laquelle la complexité computationnelle contraint l'acquisition du langage. Certaines études antérieures portant sur l'acquisition normale et pathologique de la L1 avancent en effet la complexité computationnelle comme une explication à l'ordre d'émergence de certaines structures linguistiques dans le développement du langage (Guasti 2002; Rizzi 2002; Van Kampen 1997; Zuckerman 2001; Jakubowicz 2005 ; a.o.). L'idée est que la complexité computationnelle contraint l'acquisition du langage parce que les structures complexes, qui présentent une charge de traitement plus importante, apparaissent plus tard dans le développement normal et sont sources de difficultés dans les cas d'acquisition atypique du langage (Jakubowicz 2005). L'hypothèse de la complexité dérivationnelle (« Derivational Complexity Hypothesis » 'DCH') de Jakubowicz (2005, 2011) suggère que les séquences développementales peuvent être expliquées par la manière dont les systèmes computationnels interagissent avec les systèmes de performance linguistique (ex : mémoire de travail) pour traiter les structures complexes. Bien que la définition de la notion de complexité demeure peu précise et controversée, les études antérieures réalisées dans le cadre de cette approche soutiennent cette hypothèse et cela en s'appuyant sur la production induite de questions-qu, de clitiques accusatifs et de relatives ainsi que sur l'analyse de la fréquence de subordination dans le langage spontané. L'exploration de ces structures a fourni des résultats fructueux concernant l'acquisition du langage chez les enfants présentant un développement typique ainsi que chez les enfants et les adolescents avec TSL, chez les enfants et les adolescents malentendants ou présentant une épilepsie Rolandique (voir par exemple, Jakubowicz & Strik 2007; Tuller, Henry, Sizaret & Barthez 2012; Hamann, Tuller, Monjauze, Delage & Henry 2007; Friedmann, Belletti, & Rizzi 2009; Soares 2006; Delage 2008; Monjauze 2007). De plus, la fréquence d'enchâssement dans le langage spontané semble être particulièrement discriminante entre les populations au développement typique et les populations pathologiques, en particulier parce que les populations pathologiques ont tendance à éviter la syntaxe complexe (Tuller et al. 2012; Tuller & Hamann 2010).

L'hypothèse de la complexité computationnelle (telle qu'elle a été formulée par Jakubowicz, 2004) n'a été appliquée à l'étude de l'acquisition de la langue seconde que récemment (Prévost et al. 2010). L'approche générativiste était jusque là concentrée principalement sur la question du statut des catégories fonctionnelles chez cette population. Bien que les connaissances sur l'influence de la complexité sur le développement de l'enfant L2 demeurent réduites, un petit nombre d'études a révélé que les enfants L2 ne présentent pas de difficulté particulière au niveau de la production de propositions enchâssées (Haznedar 2003; Gavruseva and Lardiere 1996; Lakshmanan and Selinker 1994). Vu l'objectif de cette étude de distinguer les effets des TSL des effets du bilinguisme et vu les données de la littérature selon lesquelles les enfants L2 et les enfants avec TSL se comportent différemment au niveau de l'enchâssement, une comparaison directe de la fréquence d'enchâssement entre les deux groupes semble particulièrement importante.

De manière générale, on considère que la fréquence d'utilisation d'une structure syntaxique donnée constitue un indice de son niveau d'acquisition par l'apprenant. Cette acquisition peut également être appréhendée à travers le taux auquel cette structure est produite sans erreur morphosyntaxique. La question des liens potentiels entre le degré de complexité syntaxique et la production d'erreurs a fait l'objet de plusieurs études chez les enfants avec TSL. Celles-ci ont mis en évidence la production plus fréquente d'erreurs au sein des structures syntaxiquement complexes (Tuller et al. 2012; Gillam & Johnston 1992; Pizzioli & Schelstraete 2008). Chez les enfants L2 en revanche, cette dimension a été relativement peu explorée (Simon-Cereijido & Gutiérrez-Clellen 2007; Prévost, Morin & Tuller 2011).

La question plus générale de l'acquisition de certaines propriétés morphosyntaxiques a été au cœur de nombreuses études TSL-L2. Plusieurs propriétés, comme la morphologie verbale, les pronoms clitiques objet et l'accord en genre, ont ainsi été identifiées comme étant source d'erreurs chez les enfants TSL et L2. Toutefois, les groupes d'enfants comparés dans ces études présentaient une étendue d'âge limitée (souvent 6-9 ans) et les enfants L2 étaient également limités quant au nombre d'années d'exposition à leur L2 (en général autour de 2;6 voire moins). Dans ce travail, il a donc été décidé de prêter une attention particulière à la production spontanée de ces différentes propriétés morphosyntaxiques au sein d'un groupe d’enfants présentant une étendue d’âge et de durée d’exposition plus importante que dans la plupart des études antérieures.

La question principale de recherche adoptée dans cette étude concerne l’impact de la complexité computationnelle sur l’acquisition d’une L2 chez l’enfant sain. Afin d’apporter une réponse à cette question, des échantillons de langage spontanés ont été recueillis de façon longitudinale chez un groupe d’enfants L2 et un groupe d’enfants avec TSL. Ces échantillons ont ensuite été analysés pour déterminer la fréquence des propositions enchâssées, structures qui sont considérées comme impliquant une certain degré de complexité syntaxique. L’objectif de cette comparaison directe entre les enfants L2 et TSL est d’aboutir à une meilleure compréhension du développement L2 typique. L’idée est que lorsque ces deux groupes d’apprenants se comportent de manière différente pour une propriété donnée, le comportement des enfants L2 vis à vis de cette propriété peut être considéré comme typique et celui des enfants avec TSL comme atypique (étant donné que ces enfants constituent une population clinique). Cette propriété pourrait ensuite être utilisée pour dépister les TSL chez les enfants L2. Malheureusement, aucune propriété robuste appartenant au groupe atypique et pas au groupe L2 typique n’a encore été objectivée. Par ailleurs, l’hétérogénéité qui est commune aux enfants L2 et aux enfants avec TSL complique la caractérisation de ce type de propriété. En particulier, une connaissance plus profonde de l’impact que des facteurs tels que la durée d’exposition, l’âge de début d’exposition, et l’âge chronologique peuvent avoir sur le développement typique chez l’enfant L2 est nécessaire.

Etant donné ces objectifs principaux et le cadre théorique présenté ci-dessus, cette thèse vise à porter une réponse aux questions suivantes :

1. Comment l’enchâssement propositionnel se développe-t-il chez les enfants L2 par rapport aux enfants avec TSL ?
2. S’il existe, quel est le lien entre le développement de l’enchâssement propositionnel et le taux d’erreurs morphosyntaxiques dans ces populations ?
3. A quoi le développement L2 enfantin typique ressemble-t-il ? Plus précisément, comment les facteurs de durée d’exposition, d’âge de début d’acquisition et d’âge chronologique influent-ils sur les performances linguistiques des enfants L2 ?

Afin de répondre à ces questions, des scores à des tests standardisés et des échantillons de langage spontané ont été recueillis au sein d’un groupe de 22 enfants anglophones âgés de 6 à

12 ans acquérant le français en tant que L2 et de 19 enfants monolingues francophones avec TSL. Conformément à la littérature, nous avons considéré qu'un enfant L2 se définit par un début d'exposition au français après l'âge minimum de 4 ans. En effet, les chercheurs en acquisition s'accordent pour dire qu'à cet âge, les composantes principales de la grammaire de la L1 sont acquises (Guasti 2002). Aussi, le développement d'une L2 après cet âge a lieu sous l'influence potentielle d'une L1 déjà en place.

Afin de déterminer l'effet des facteurs évoqués dans la littérature sur les performances linguistiques des enfants L2 en anglais et en français, nous avons essayé de recruter des enfants qui variaient au niveau de leur durée d'exposition à la L2, de leur âge de début d'exposition, et de leur âge chronologique. Les caractéristiques du groupe L2 sont suivantes : 1) âge chronologique moyen: 9;8, *ET* = 1;9 ; étendue: 6;9 - 12;7; 2) âge moyen de début d'acquisition: 7;0, *ET* = 1;0, étendue: 4;6-10;9; 3) durée moyenne d'exposition: 2;6; *ET* = 1;1; étendue: 0;11-3;11). Des enfants avec TSL ont ensuite été appariés aux enfants L2 sur la base de l'âge moyen (9;9 *ET* = 1;11 ; range : 6 ;5-12;11). Etant donné que l'évaluation du langage est fortement liée à l'âge chronologique, l'appariement en âge nous permet de voir à quel point les performances des enfants L2 ressemblent à celles des enfants du même âge appartenant à une population clinique. Les échantillons du langage spontané ont ensuite été analysés pour la fréquence de propositions enchâssées, pour le taux d'erreurs morphosyntaxiques global, et pour la production correcte de trois propriétés morphosyntaxiques : la morphologie verbale, les pronoms clitiques objet et le genre grammatical.

Cette thèse s'organise de la manière suivante : le chapitre 2 est consacré à une revue de littérature psycholinguistique concernant le développement L2 chez l'enfant. Nous y présenterons plus particulièrement les travaux qui se sont intéressés aux trois propriétés morphosyntaxiques mentionnées ci-dessus. Nous rapporterons également les résultats d'études centrées sur d'autres propriétés morphosyntaxiques comme le *scrambling* ou les formes passives. Une attention particulière sera portée à l'impact des différents facteurs que l'on suppose jouer un rôle dans le développement L2, à savoir la durée d'exposition, l'âge de début d'exposition, l'âge chronologique, le transfert L1, ainsi que la quantité et qualité d'input de la L1 et de la L2. Bien que la présente étude traite principalement du développement langagier, nous ferons également référence à certaines études portant sur le stade ultime d'acquisition L2.

Le **chapitre 3** présente des tendances dans la recherche en acquisition du langage dans le contexte d'un TSL, en regardant plus particulièrement les études qui portent sur la morphologie verbale, les clitiques objet, le genre grammatical, ainsi que le développement des structures complexes chez les enfants et adolescents avec TSL. La notion de la complexité computationnelle et les résultats des études ayant adopté cette approche théorique seront présentés. Nous nous intéresserons plus particulièrement aux travaux ayant trouvé des résultats intéressants concernant l'évitement des structures syntaxiques complexes chez les apprenants avec TSL. L'analyse de la fréquence des structures complexes étant une méthode prometteuse pour la caractérisation linguistique des enfants avec TSL, nous développerons l'idée que cette méthode devrait être appliquée à la comparaison TSL-L2.

Le **chapitre 4** passe en revue les études antérieures portant sur la comparaison TSL-L2. L'objectif de ce chapitre est de décrire l'état actuel de cette littérature comparative et de montrer quelles pistes de recherche n'ont pas encore été abordées. Une attention particulière sera prêtée aux caractéristiques des populations expérimentales et aux propriétés linguistiques examinées.

Dans le **chapitre 5**, les objectifs précis, les questions de recherche et les hypothèses et prédictions de la présente étude seront exposés. Ce chapitre décrira également les analyses linguistiques qui serviront de base pour les propriétés étudiées dans cette thèse ainsi que leur instanciation en français et en anglais.

La méthodologie sera explicitée dans le **chapitre 6**. Nous présenterons d'abord les caractéristiques générales des enfants L2, TSL et témoins ayant participé à notre étude, ainsi que les critères de sélection utilisés pour recruter ces groupes expérimentaux. Ce chapitre présentera également le questionnaire familial utilisé pour le recueil des informations concernant la quantité et qualité d'input linguistique auquel les enfants L2 sont exposés. Les tâches standardisées et l'analyse du langage spontané seront ensuite décrites. Le système codage du langage spontané et le calcul des mesures morphosyntaxiques seront détaillés.

Les résultats principaux concernant les tests standardisés et le langage spontané seront présentés dans le **chapitre 7**. Les données concernant la fréquence d'enchâssement nous permettront de voir que les enfants L2 se comportent comme les enfants témoins de même d'âge moyen, contrairement aux enfants avec TSL. En revanche, nous verrons que l'analyse des erreurs et des propriétés morphosyntaxiques révèle des similarités et des différences entre les enfants L2 et enfants avec TSL. De façon remarquable, l’étude des liens entre le taux d’erreurs global et le taux d’enchâssement fait apparaître des patterns développementaux différents entre les deux groupes : Les enfants L2 produisent des propositions enchâssées de façon précoce dans leur développement et celles-ci s’accompagnent d’un taux d’erreurs élevé alors qu’au sein des enfants avec TSL, les propositions enchâssées sont associées à des taux d’erreurs moins élevés. Chez les enfants L2, la durée d’exposition est corrélée avec le taux d’erreurs, mais aucun lien entre la durée d’exposition et la fréquence d’enchâssement n’a été observé.

Le **chapitre 8** examine les différences et similarités de profil observées entre les enfants avec TSL et les enfants L2. Des données expérimentales antérieures obtenues de ce même groupe d’enfants L2 seront comparées aux données présentées dans le chapitre 7 afin de comprendre l’implication possible des facteurs méthodologiques sur les résultats observés. Par ailleurs, les implications cliniques de cette recherche concernant le diagnostic, et plus particulièrement, la création d’outils d’évaluation du langage chez les enfants L2 seront discutées. L’impact des facteurs L2 supposés influencer l’acquisition L2 enfantine sera évalué. La conclusion présentée dans le **chapitre 9** propose de considérer que le développement L2 typique se caractérise par une mise en œuvre précoce de la subordination.

1.2 Introduction (English)

The focus of this thesis is the comparison of English-speaking children acquiring French as a second language (henceforth, L2 children) with French-speaking monolingual children with specific language impairment (henceforth, SLI). Standardized test scores and spontaneous language measures, including the frequency of clausal embedding and the target-like production of inflectional morphology, object clitics, and grammatical gender, were analyzed longitudinally and constituted the empirical basis for this comparison.

Previous research comparing typically-developing (TD) L2 children to age-matched children with SLI has revealed many similarities in the linguistic performance of these two groups (Håkansson & Nettelbladt 1993, 1996; Paradis & Crago 2000, 2004; Grüter 2005; among others). At the same time, the expansion of the European Union and the subsequent increase in migration across European nations has lead to a dramatic increase in the number of second language learners in schools across Europe as well as to the number of L2 children in the caseloads of speech-language therapists. The combination of overlapping profiles between L2 children and children with SLI as well as the increase of L2 children in schools worldwide creates a situation in which many L2 children could potentially be either missed or incorrectly diagnosed with language impairment (see Paradis 2005 and citations therein). Thus, there is a pressing need to develop diagnostic tools which allow clinicians to distinguish between a typically-developing L2 child and an L2 child with SLI.

Although there are most likely as many children who speak a second language as there are monolingual children in the world (Tucker 1998), much less is known about how typical second language acquisition proceeds in childhood compared to monolingual acquisition. One obstacle that is often referred to in the literature on L2 children is the heterogeneity found among these children, which is often attributed to differences such as quantity and quality of L2 input, age of at first exposure to the L2, chronological age, length of exposure to the L2, grammatical properties of the L1, working memory and executive functions, and sociolinguistic status of the L1, to name a few (e.g., Paradis 2008). Furthermore, it has been acknowledged that there are conceivably several normal and healthy paths that can lead to successful L2 acquisition (Paradis, Genesee, & Crago 2011). One objective of the study of L2 acquisition in children is to identify and characterize these typical, healthy paths in order to distinguish them from those which are indicative of language impairment. The overall objective of this thesis is therefore to contribute to research on the L2-SLI comparison by trying to better understand what typical L2 acquisition looks like. The L2-SLI comparison is a necessary part of determining which linguistic characteristics belong to one group only and which belong to both.

The theoretical background for this thesis is based on the notion that computational complexity constrains language acquisition. Previous research on typical and impaired L1 language development has often pointed to computational complexity as an explanation for the order of emergence of certain structures in language development (Guasti 2002; Rizzi 2002; Van Kampen 1997; Zuckerman 2001; Jakubowicz 2005, among others). The idea is that computational complexity impacts language acquisition because complex structures are more costly to process and therefore, emerge later in typical acquisition and create difficulty for learners in atypical contexts (Jakubowicz 2005). Jakubowicz's DCM hypothesis (2005, 2011) asserts that developmental sequences can be explained by the way that the computational system interacts with linguistic performance systems (e.g., working memory) to derive complex structures. Although a precise, uncontroversial definition of complexity remains elusive, previous work conducted under this approach has provided evidence in favor of this general claim based on the elicited production of wh-questions, accusative clitics and relative clauses and on the analysis of frequency of subordinate clauses in spontaneous language. The investigation of these structures have led to fruitful results in acquisition research on young TD children, children and adolescents with SLI, hearing loss and Rolandic epilepsy (see for example, Jakubowicz & Strik 2007; Tuller, Henry, Sizaret & Barthez 2012; Hamann, Tuller, Monjauze, Delage & Henry 2007; Friedmann, Belletti, & Rizzi 2009; Soares 2006; Delage 2008; Monjauze 2007). Interestingly, the frequency of embedded clauses in spontaneous language has been shown to be particularly useful in distinguishing between impaired and unimpaired populations, in part because atypically-developing populations tend to avoid complex syntax (Tuller et al. 2012; Tuller & Hamann 2010).

The computational complexity hypothesis (as formulated by Jakubowicz 2004) has only recently been applied to the study of child L2 acquisition (Prévost et al. 2010). The generative approach to child L2 acquisition has been focused mainly on the question of the status of functional categories in these learners. Although little is known about the impact of complexity on child L2 development, a small number of studies have noted that L2 child learners do not have particular difficulty producing embedded clauses (Haznedar 2003; Gavruseva and Lardiere 1996; Lakshmanan and Selinker 1994). Given the research goal of disentangling the effects of SLI from the effects of bilingualism and the evidence from the literature that the L2 and SLI behave differently with respect to clausal embedding, a direct comparison of the frequency of clausal embedding in both groups was in order.

The frequency of use of a particular structure can be considered an indicator of the relative ease and efficiency with which the learner produces a certain structure. Another indicator of how well a structure has been mastered is the rate at which the structure is produced without errors in morphosyntax. The link between morphosyntactic accuracy and complexity has been the subject of previous studies on children with SLI. These have shown that errors tend to occur more often during the production of complex structures (Tuller et al. 2012; Gillam & Johnston 1992; Pizzioli & Schelstraete 2008). This particular question has received rather limited attention in the child L2 literature (Simon-Cereijido & Gutiérrez-Clellen 2007; Prévost, Morin & Tuller 2011).

The overall question of accuracy with certain morphosyntactic properties has, however, received the most attention in SLI-L2 studies. Phenomena such as verb morphology, object clitics, and gender agreement have been shown to be prone to error in the L2 and SLI populations. However, these prior comparative studies have tended to focus on groups of children with limited age ranges (6-9 years approximately) and on L2 children with somewhat limited length of exposure to the L2 (typically around 2 years or less). Therefore, particular attention was paid to the accuracy with which the present groups of children, who have a wider range of age and exposure to the L2, produce these forms in spontaneous speech.

The principal research question of this thesis concerns the impact that computational complexity has on child L2 acquisition. In order to respond to this question, spontaneous language collected longitudinally from a group of children with SLI and a group of L2 children was analyzed for the frequency of clausal embedding, an arguably complex syntactic structure. The L2-SLI direct comparison provides an opportunity for better understanding typical L2 development. The idea here is that, if the SLI and the L2 behave differently for a specific property, then the behavior of the L2 would be considered typical and the behavior of the SLI would be considered atypical, seeing as the SLI belong to a clinical population. This particular property, then, could be used to identify L2 children with language impairment. Unfortunately, the literature so far has not discovered a robust property for which the SLI and L2 have different performance. Furthermore, the heterogeneity of both the L2 and SLI make this type of discovery quite challenging. In particular, more needs to be known about the impact that factors such as length of exposure (LoE), age of onset (AoO), and chronological age (CA) have on the variability observed in L2 learners.

Given the main objectives and the theoretical background stated above, this thesis aims to address the following additional research questions:

1. How does clausal embedding develop in child L2 acquisition compared to SLI?
2. What, if any, is the link between the development of clausal embedding and morphosyntactic accuracy?
3. What does typical L2 child development look like? More specifically, how do the factors of length of exposure (LoE), age of onset (AoO), and chronological age (CA) impact language performance in L2 children?

In order to provide answers to these questions, standardized tests scores and spontaneous language samples were collected longitudinally from a group of 22 6-12-year-old English-speaking children who were acquiring French as an L2 and from 19 6-12-year-old monolingual French-speaking children with SLI. The definition of an L2 child adopted for this study included children whose first exposure to French occurred at age 4 or later. There is wide consensus that the major morphosyntactic and phonological components of the L1 grammar are in place by age four in typical language development (see Guasti 2002, for example), and therefore L2 development after age 4 occurs with the potential influence of what is assumed to be a fully-acquired L1. An attempt was made in the selection of the L2 children to vary certain criteria such as CA, AoO, LoE in order to observe the effect that these factors have on linguistic performance in the L2 and the L1. The L2 group has the following characteristics at T1: 1) mean CA = 9;8**,** *SD* = 1;9; range: 6;9-12;7; 2) mean AoO = 7;0, *SD* = 1;0, range: 4;6-10;9; 3) *LoE* = 2;6; *SD* = 1;1; range: 0;11-3;11). The children with SLI were matched to the L2 group by mean age (9;9, *SD* = 1;11 ; range : 6;5-12;11). Because language development in children is generally assessed with respect to CA, the L2 and SLI are age-matched in order to see to what extent L2 performance resembles that of a clinical population of the same age. The spontaneous language samples were analyzed for frequency of subordinate clauses embedded in a matrix clause (clausal embedding), error rates, and the accuracy with which specific morphosyntactic forms (verb morphology, object clitics, and gender agreement) were produced.

This thesis is organized as follows: **Chapter 2** presents a review of the child L2 literature centered around previous studies looking at verb morphology, object clitics, and gender, as well as work on the development of other syntactic phenomena such as scrambling and passives. Particular attention will be paid to what is known about the role of such factors such as CA, AoO, LoE, L1 transfer, and quality and quantity of L1 and L2 input, which are assumed to influence L2 development to varying degrees. Although the present study is about linguistic development, studies on the ultimate attainment question will be referred to when relevant.

In **Chapter 3**, trends in research on SLI will be reviewed, with a particular focus on verb morphology, object clitics and gender, and on the development of complex structures in children and adolescents with SLI. The notion of computational complexity and the results from studies which have adopted this perspective in some form will be discussed. Studies which found that the frequency of complex syntax was a fruitful method of distinguishing between healthy and impaired individuals will be described. It will become clear that this method was successful for the characterization of impaired monolinguals and has potential to contribute to the distinction between typical and atypical L2 acquisition in children.

Chapter 4 reviews previous direct SLI-L2 comparisons. The goal of this chapter is to review what is known about SLI and L2 learners and to show where there are gaps in the literature concerning this comparison. Particular attention will also be paid to the characteristics of the experimental populations and to the grammatical phenomena examined in these studies.

In **Chapter 5**, the precise goals, research questions, hypotheses and predictions of the present study will be spelled out. This chapter also describes the linguistic basis for the properties of interest to this study (embedded clauses, verb morphology, object clitics, and grammatical gender) and how they are instantiated in French and English.

The methodology will be explained in detail in **Chapter 6**. This will include a description of the SLI, L2 and control groups, as well as selection criteria that were used in the recruitment process. Chapter 6 also describes the family questionnaire that was used to provide us with more information about the L2 children's background and to have a better idea of the type and amount of exposure they have to their L1 outside of school. In addition, the descriptions of the standardized tests and the analysis of the spontaneous language samples will be presented. This will include descriptions of the coding system as well as how the measures of clausal embedding and morphosyntactic accuracy were calculated.

The major results obtained from the standardized test scores as well as from the analyses of clausal embedding and morphosyntactic accuracy are presented in **Chapter 7**. A general pattern emerges from these data in which the L2 group patterns with a group of 8- and 11-year-old TD children for clausal embedding, whereas the SLI use clausal embedding less frequently. However, an analysis of error rates and morphosyntactic accuracy with respect to verb inflection, object clitics and grammatical gender revealed both similarities and differences between these learner groups. Interestingly, an examination of the link between error rates and clausal embedding revealed two starkly different patterns in both groups: The L2 appear to use clausal embedding from early on in their development and they make more errors as the frequency of subordination increases. The SLI performance, on the other hand, reveals a pattern in which those children who produced little subordination had the most errors. LoE in the L2 group did not appear to have a major effect on the frequency of clausal embedding, but did impact error rates.

Chapter 8 discusses the differences and similarities observed between the SLI and the L2. Special attention is paid to the differences found between younger and older children with SLI and L2 children. Previous results for the same group of children obtained via elicitation tasks are compared to the current study to see what differences are obtained with spontaneous language versus elicited production. The implications of the results for the development of clinical tools are presented. The impact of various internal factors on L2 performance is also examined. In **Chapter 9** I put forth the hypothesis that avoidance of clausal embedding is a sign of atypical development in L2 children.

2 Understanding L2 Acquisition

2.1 Introduction

This chapter presents a review of the literature on L2 acquisition with a focus on children acquiring French. The goal of this review is to present findings that can contribute to the overall understanding of how typical L2 child acquisition proceeds. The concentration here will be on the development of different morphosyntactic properties (verb morphology, object clitics, grammatical gender) as well as certain syntactic structures (clausal embedding, wh-questions, scrambling, and passives).

Verb morphology, object clitics and gender agreement have received substantial attention in the literature on L2 children. Tense morphology and object clitics in particular have been suggested as clinical markers of French-speaking children with SLI; however, as will be shown in this chapter, the research on L2 children suggests that these properties are not acquired easily by typically-developing L2 children either. The majority of the children in studies on L2 French were younger and had limited LoE. Many of these studies also included a very small number of participants. Therefore, one objective of the current study is to contribute to our understanding of the status of these properties in the spontaneous language of a larger group of L2 children with a wider range of CA and LoE. This will allow us to better observe the individual variation that is characteristic of L2 development in children, thereby contributing to our overall understanding of how L2 acquisition proceeds in typically-developing (TD) children.

Studies carried on L2 children from a generative perspective have focused mainly on the morphosyntactic properties mentioned above. Less attention has been paid to the development of syntactic structures such as subordinate clauses, whereas this type of structure has received considerable attention in the literature on SLI (see Chapter 3). Therefore, the review presented in this chapter will also cover studies that have discussed what is known about the development of certain syntactic structures in L2 children. Admittedly, this division between morphosyntactic properties and syntactic structures is a bit simplistic; however, it will allow us to group together prior research that has focused more on structure.

In the first part of this chapter, the definition of child L2 and its ties to the so-called critical period will be addressed. Certain theoretical accounts which propose characterizations of the nature of L2 acquisition will be discussed. In Section 2.2, L2 child studies targeting verb morphology, object clitics and grammatical gender will be discussed. The objective of this section is to present what is known about how L1 transfer affects the development of these structures and whether the theoretical accounts of L2 acquisition can explain the developmental patterns observed. These properties have been the object of much research in both L2 children and children with SLI. In addition, the child L2 development of certain syntactic structures (clausal embedding, Wh-questions, scrambling and passives) will be presented.

A general objective in the research on child L2 is to attempt to explain the well- documented individual variation in language performance. This is often done through the study of variables that are assumed to influence language performance in L2 children, such as chronological age at time of testing (CA), age of onset (AoO), length of exposure to the L2 (LoE), working memory, and skills in the L1. These factors are often referred to as internal factors, in that they are internal to the child. The influence of additional factors such as the quantity and quality of input received by the child, the SES of the child's family, the sociolinguistic status of the L1, and the parents' proficiency in the L2 (i.e., external or environmental factors) are also assumed to have an effect on performance in the L2. The last section will therefore concentrate on what is known about the impact of internal and external factors on success in L2 acquisition. Many of the same studies mentioned in the second section of this chapter will be reviewed again in the final section in order to group together the relevant facts about the effect that these factors have on child L2ers. Recent research suggests that factors such as input quantity can have an important impact on how L2 development proceeds; and therefore, the understanding of the role these factors play in typical L2 acquisition is essential in recognizing language impairment in L2 children.

2.2 Defining Child L2 Acquisition

In this thesis the term *child L2* will be used to refer to a child whose initial exposure (henceforth, age of onset, or AoO) to the second language (L2) began at age 4 or later and who was 12 years old or younger at the time of the first testing session. The lower age limit of (around) four is often used in the acquisition literature as the cutoff between simultaneous bilingual acquisition and child L2 acquisition, because by this age the child is assumed to have acquired the major phonological, syntactic and morphological structures of their L1 (Guasti 2002). The idea is that by age 4, L2 children begin acquisition of the L2 with a first language already in place. Simultaneous bilinguals (2L1), on the other hand, acquire two languages at the same time. However, determining at what age simultaneous bilingualism ends and sequential bilingualism begins is not without controversy (Meisel 2008, 2009).

The choice of the upper age boundary differs somewhat from other child L2 studies. In the generative approach to child L2 acquisition, most studies set an upper limit for L2 child acquisition at 8 years (Schwartz 2004; Unsworth 2005; Haznedar & Gavruseva 2008). An adult L2er is then defined as a learner whose AoO is 8 or older. The reasoning behind this cutoff is linked to the critical period hypothesis for language acquisition (see Section 2.2.1). Unlike these studies, the current study set the upper age boundary at 12 years (at T1), which corresponds to the end of childhood. This decision was made in order to gain more insight into typical L2 development in younger as well as older L2 children, and to obtain a wider range of LoE and AoO.

2.2.1 Child L2 and the Critical Period Hypothesis

The idea behind defining the acquisition context according to age of onset is based on the notion of a critical period for language acquisition. Individuals deprived of access to linguistic input before a certain age have great difficulty acquiring a first language compared to children who acquire their first language in typical circumstances. The examples of so-called “wild children” as well as instances of child abuse and hearing loss provided evidence for the Critical Period Hypothesis (CPH) (Penfield & Roberts 1959; Lenneberg 1976; see Bortfeld & Whitehurst 2001 for a review). The general idea is that there is a temporal window in which the child must have access to linguistic input in order for acquisition to proceed in an optimal manner. The mechanisms involved in language acquisition change with maturation such that the possibility of attaining target-like competence in a language declines with age (Meisel 2009, White 2003, DeKeyser 2000). For second language acquisition, studies on ultimate attainment in late onset versus early onset L2 learners point to different ages ranges during which the capacity to attain native-like competence in an L2 steadily declines. Some researchers suggest that certain changes begin to take place around puberty (Lenneberg 1967), while others suggest that it might be more around the age of 6-7 (Johnson & Newport 1989; Weber-Fox & Neville 1996; among others, see DeKeyser 2000 for a review). Meisel (2009) has advocated for an even younger boundary, arguing that the critical period for verb morphology may end sometime between 3 and 4 years old. This also reflects the argument made by many that there may be separate critical periods per linguistic domain, some of which may end early in childhood (Scovel 1988; Weber-Fox & Neville 1996; see DeKeyser 2000 and sources cited therein). There are also those who argue, based on studies showing similar language performance between early and late learners, that critical period effects do not fundamentally alter the L2 acquisition process (White & Genesee 1996; Hakuta 2001, Bialystok & Miller 1999).

2.2.2 Ultimate Attainment and Development

The idea advanced by the CPH is that children are better than adults at language learning. As stated above, evidence for the CPH has been obtained through the study of ultimate attainment in adult and child L2ers. Although particular attention will be paid to the contribution of the AoO factor in the overall success of the child L2ers in this study, this thesis is about child L2 development and will not have much to say about ultimate attainment. Despite the controversy concerning the critical period, it is often assumed that children who begin a second language sometime early in childhood will eventually reach the target grammar (Paradis 2010). However, as the number of studies on L2 child acquisition increases, this assumption is often called into question. It appears that exposure to the L2 during childhood does not guarantee that the learner will converge on the target grammar (see for example, Unsworth 2008, Section 2.3.3.4). One of the major issues with this assumption is that it is not known how long it should take an L2 child to converge on the target grammar. Furthermore, not enough is known about the possible (healthy) developmental paths that the L2 child could be expected to take in order to reach native-like competence.

The following section presents theoretical accounts which attempt to characterize aspects of the grammatical system which underlie L2 acquisition.

2.2.3 Theoretical Approaches to Child L2

Although most L2 researchers agree that there are many observable differences between L1 and L2 acquisition, there is much debate about the nature of L2 acquisition with respect to L1. A question which is central to L2 research within the generative framework concerns whether the differences observed in these two learner groups reflect fundamental differences in the mechanisms which underlie linguistic development. Bley-Vroman (1990) put forth the Fundamental Difference Hypothesis (FDH) which states that general cognitive mechanisms, not domain-specific ones, are available to adult L2 learners. Proponents of the FDH argue that adult L2ers do not have access to Universal Grammar (UG) and therefore knowledge obtained in adult L2 acquisition is of a different nature than L1 acquisition. On the other hand, many researchers have adopted the position that L2 learners do in fact have access to UG and that differences between L1 and L2 acquisition are caused by other factors (see White 2003 for a review). The Full Transfer Full Access (Schwartz & Sprouse 1994, 1996) represents this position and assumes that L2 learners have access to UG and UG principles constrain L2 development. This approach asserts that L2 learners begin L2 acquisition with their L1 grammar as a blueprint to which changes can occur as L2 development proceeds.

The characterization of underlying L2 grammars (interlanguage), with special attention to status of functional categories, has also been driving recent research in L2 acquisition within the generative framework. One set of approaches assumes that L2 grammars can be characterized by an absence or impairment in functional categories in initial or all stages of acquisition (e.g., Minimal Trees Hypothesis: Vainikka & Young-Scholten, 1994, 1996a, 1996b; Valueless Features Hypothesis: Eubank 1993/1994; Failed Functional Features Hypothesis: Hawkins & Chan 1997). These accounts are often referred to as the impairment view. Contrary to these positions are those which assume that the underlying L2 grammar is intact and that patterns in the L2 data can be explained by performance factors. The most frequently cited account representing this position is the Missing Surface Inflection Hypothesis (MSIH, Prévost & White 2000), which assumes that variability observed in L2 performance stems from a problem in accessing target morphological forms. In other words, the underlying syntax is intact, but the learner sometimes fails to produce the appropriate morphological form. The basis for this idea is that L2 learners' performance reveals evidence of syntactic knowledge, but inflectional morphology is nevertheless supplied in an inconsistent manner. These problems with morphological realization are said to be due to processing issues (White 2003).

The MSIH therefore assumes a dissociation between morphology and syntax in L2 acquisition. Moreover, Schwartz's Domain by Age Model (DAM) considers that "in the domain of inflectional morphology, child L2 acquisition is more like child L1 acquisition, and in the domain of syntax, child L2 acquisition is more like adult L2 acquisition" (Schwartz 2003:47). This implies that the optimal period in which inflectional morphology must be acquired is much earlier in life than it is for syntax (Blom 2008, Meisel 2009).

Much work in L1 and L2 language acquisition has been done with the goal of understanding how syntax and morphology develop. Variability in the suppliance of inflectional morphology is common to both groups. For example, in typical L1 development (TD L1), children go through a stage in which they optionally produce infinitives in contexts requiring a finite form. Some approaches attribute the appearance of these so-called root infinitives (RI)[1] to linguistic mechanisms that must undergo maturation later in development. For example, Rizzi's Truncation hypothesis (1994) claims that functional categories are present in early grammars, but that they are not systematically projected. This account is based on the Root Principle (Rizzi 1994) which considers that all root declaratives have a CP projection in the adult grammar and that this principle undergoes maturation during the course of L1 development. Before the Root Principle comes online, children may produce structures which are truncated below CP in order to alleviate processing demands. If the structure is truncated at the VP level, then a root infinitive will be the result in production. Wexler's (1998) Unique Checking Constraint (UCC) makes a slightly different proposal, but also assumes that the immaturity of a linguistic mechanism is behind the production of infinitives in finite contexts (see Section 3.4.2 for more details on this approach).

The accounts proposed by Rizzi and Wexler assume that the optional suppliance of inflectional morphology is a characteristic of immature grammars. Part of the interest in comparing L2 children to L1 children can help test such hypotheses about the nature of acquisition. As outlined by Schwartz (2004), studying developmental sequences in child L2 compared to child L1 allows for testing predictions about the role of maturation in acquisition. The idea is that if the L2 child begins L2 acquisition after already having passed through a maturational-dependent stage in the L1, then a similar stage should not be observed in acquisition of the L2. In other words, maturation can only happen once, so if the L2 is acquired after maturation has occurred and the associated properties are already in place, then stages which are supposedly dependent on maturation should not be observed in L2 development.

The next section will review a number of studies which have contributed to the characterization of how certain morphosyntactic properties emerge and develop in L2 acquisition. Many of these studies carried out comparisons between L2 children and other

[1] The term root infinitive (RI) or optional infinitive (OI) will be used to refer to non-finite forms that are produced in contexts in which a finite verb is expected. These terms are generally associated with different theoretical accounts, but I will use them without referring to any specific theory.

learner groups, such as TD monolingual children, simultaneous bilinguals (2L1), and L2 adults in an attempt to better understand what is particular about L2 child acquisition and what it shares with other learner contexts.

2.3 Morphosyntactic Properties in Child L2 Development

In this section, studies which have examined the development of verb morphology, object clitics, and grammatical gender will be discussed. After a brief review of the morpheme order studies from the 1970s, the focus will turn to more recent studies involving these properties child L2 grammars. Reviewing these studies will allow for an overview of how these domains develop in L2 children, especially for those acquiring L2 French, as well as a better understanding of the role of L1 transfer. This review will also serve as a comparison to the research carried out on clinical markers of SLI (see Chapter 3).

2.3.1 Verb Morphology

2.3.1.1 Morpheme order approaches

Based on work done on L1 acquisition in the 1970s, studies examining the acquisition sequences of certain morphemes were carried out on L2 children learning English as the target language. Dulay & Burt (1973) analyzed “difficulty orders” of eight English morphemes in the spontaneous speech of 151 native Spanish-speaking children. This measure was calculated based on a ratio of the number of morphemes produced out of the total obligatory contexts. The different morphemes could then be ranked, and the morphemes with higher ratios were considered “easier” than the others. The L2 children who participated in this study came from different Spanish-speaking communities in the US and were not equivalent in terms of length of exposure to the L2. However, time exposed to English did not make a difference in terms of the morpheme order. For example, group means showed that, overall, each group was most accurate with the progressive *–ing* and the least accurate with the genitive marker -*‘s* and with the 3rd person singular tense-marker *–s*.

Later studies using a similar methodology showed that, generally speaking, other types of L2 learners showed significant similarities in their accuracy of English morphemes (Dulay & Burt 1974 for L1 Chinese, L1 Spanish learners; Makino 1980 for L1 Japanese adolescent learners in a formal setting; and Bailey et al. 1974 for adult learners of various L1s; see Hawkins 2001 for a review). The authors interpreted these results to mean that learners with diverse backgrounds nevertheless have similar relative accuracy with these morphemes. However, these morpheme order studies were later criticized as being too descriptive in nature. The relative accuracy observed for certain morphemes does not necessarily reflect the emergence of the underlying syntactic properties in L2 development (Unsworth 2005, Hawkins 2001). In additional, little attention was paid to individual results. It is possible that these group means mask other patterns in the data (Hawkins 2001).

Following this research program of the 1970s, the focus in L2 acquisition from a generative perspective shifted to adults (see White 2003 for a review). Recently, interest in child L2 acquisition has been renewed and with it, a focus on the emergence of functional categories in this acquisition context. As the morpheme order studies suggest, and as later research has also shown, all types of learners have difficulty with grammatical morphemes. In a way that parallels the study of inflectional morphology in L1 acquisition, the acquisition of the verbal domain has been the subject of more recent research in L2 child acquisition. These studies will be discussed in the remainder of this section.

2.3.1.2 Verb morphology in child L2 French

2.3.1.2.1 Prévost & White (2000) and Grondin & White (1996)

The objective of Prévost & White's (2000) and Grondin & White's (1996) studies were to find out if morphological variability in L1 and L2 acquisition is due to similar causes. Prévost and White reported on the initial stages of L2 development in two children, Kenny and Greg, acquiring French as an L2 (L1 English) in a French-speaking kindergarten in Montreal. Kenny was aged 5;8 (years;months) and Greg was 5;4 at the time of the first recording. The authors argue that both children were in very early stages of L2 development at the beginning of the study (Kenny: LoE = 0;2 and Greg: LoE = 0;5). Spontaneous language data was collected during play sessions with a research assistant. Kenny and Greg were recorded approximately once a month until they were between 7 and 8 years old (Grade 2).

Kenny and Greg's utterances were analyzed for phenomena associated with the root infinitive stage in order to see if the L2 children patterned with L1 children in this respect. In addition to the verb form produced (finite or non-finite), additional syntactic properties can be used as evidence of finiteness. These include the subject type produced (null, clitic, bare NP or full DP), the position of adverbs with respect to finite verbs. French has subject clitics which must attach to a finite verb (e.g., Auger 1994) and must obey certain properties associated with clitic status (see Kayne's diagnostic tests, 1975). For example, the subject clitic cannot be separated from the verb by other material except other clitics; furthermore, they cannot be conjoined and cannot receive contrastive stress. The frequency of clitic doubling in French is advanced as evidence that clitics are agreement markers (Auger 1994). Following this logic, if subject clitics are used according to the distributional constraints listed above, this constitutes evidence for the acquisition of finiteness (see Chapter 5 for a more detailed discussion).

These authors found that both of these children went through a root infinitive stage that lasted until month 18. From the beginning of the recordings up to month 18, 15% of Kenny's finite contexts (76/504) and 8.9% (58/649) of Greg's finite contexts contained non-finite non-finite verbs. Crucially, analysis of the non-finite forms revealed that the root infinitives were structurally constrained, i.e. the production of the non-finite form in a finite context is not the result of a problem with knowledge of verb morphology, but a structural issue. Indeed, the root infinitives co-occurred with other morphological and syntactic properties associated with a truncated structure. According to the Truncation Hypothesis (see Section 2.2.3), if root infinitives are structurally constrained, then they should be associated with certain distributional properties. Namely, RIs are predicted to occur in main clauses (not in embedded clauses or in wh-questions). In addition, they should be produced with null or bare NP subjects (not full DPs or subject clitics which require a functional projection above VP).

The predictions of the Truncation Hypothesis are borne out in the patterns observed in Kenny and Greg's data. For example, the majority of root infinitives appeared in main clauses and they were produced with null or bare NP subjects. Furthermore, the data showed that the adverb of negation '*pas*' followed finite verbs and preceded infinitives, in accordance with the V-to-I raising of finite verbs in French. These patterns also follow what has been observed for the RI stage in young TD L1 children acquiring French (e.g., Pierce 1992).

The general pattern in Kenny and Greg's data can therefore be explained by the Truncation hypothesis (Rizzi 1993/4, 2000) and closely resembled the RI profile observed in TD L1 French-speaking children. However, since Kenny and Greg were beyond the age associated with root infinitives in their L1, the idea that the root infinitive stage is determined by maturation is not supported.

In Prévost & White (2000), Kenny & Greg's results were compared with two adults who were also acquiring French as an L2 (L1 Moroccan Arabic, aged 34 years). The adult data revealed an entirely different pattern with respect to the use of finiteness and associated properties. The adult root infinitives appeared frequently in questions and embedded clauses, with subject clitics and full DPs, and preceded or followed by the negative marker *pas*. These patterns indicate that root infinitives are not structurally determined, but that they most likely result from a morphological problem. In other words, the adult learners have difficulty accessing the appropriate morphological form of the finite verb in finite contexts (Prévost & White 2000). Thus, the MSIH, which claims that inconsistency in the suppliance of inflectional morphology is due to difficulty mapping surface forms onto abstract features, can better account for the adult data (Lardiere 1998; Prévost & White 2000).

Prévost & White (2000) concentrated on data involving root infinitives. However, in an earlier study which analyzed data from the same children, Grondin & White (1996) showed that Kenny and Greg acquired finiteness early in their development, with the first indications observed at around 3 months for Kenny and 5 months for Greg. The criterion for acquisition was based on a relaxed version of Meisel's *formal variation* (1990) in which the production of a variety of any verb forms (and not just different forms of the same verb) suggested the acquisition of finiteness and therefore the presence of IP. For example, different types of verbs were found, such as imperatives, infinitives, past participles, and finite forms. In (1) below, the verb *être* 'be' is used in the third person singular present (1a) and imperfect past (1b) (*imparfait)*.

(1) a. Ca c'est un cheval.
this it's (3S.pres) a horse

b. C'était toute la famille.
it was (3S.past) all the family

(Kenny, month 3, Grondin & White, 1996)

Furthermore, subject clitics, such as *je* 'I' were used by Greg and *je* 'I' and *il* 'he' were used by Kenny in the first interviews. Subject clitics were numerous and were used in accordance with particular distributional properties (Kayne 1975). For example, subject clitics were used with finite verbs and rarely with non-finite verbs. Only 3.9% of Kenny's nonfinite verbs occurred with subject clitics (3/76); whereas 37.1% (159/428) of his finite verbs were produced with clitics. Greg produced subject clitics with nonfinite verbs a bit more often at 22.4% (13/58), but this rate was nevertheless lower than clitics with finite verbs (69.5%, 411/591). This indicated that Kenny and Greg had correctly analyzed them as clitics (see also

White 1996). In addition, subject-verb agreement was largely accurate. If clitics are considered agreement markers which attach to finite verbs (Auger 1994), then their presence in the data can be taken as morphological evidence of IP. Lastly, Kenny and Greg produced the adverb *pa*s to the right of finite verbs and to the left of nonfinite verbs which also provided evidence for verb raising past the adverb to IP. The authors therefore conclude that there is considerable evidence for the presence of IP in the early stages of Kenny and Greg's L2 development. The patterns in Kenny and Greg's data indicate that finiteness emerges quickly and in a way that resembles L1 acquisition.

2.3.1.2.2 Belletti & Hamann (2004)

In another study using longitudinal spontaneous language samples, Belletti & Hamann (2004) set out to answer the same general questions as Prévost & White (2000). Do L2 children pass through a root infinitive stage with the same characteristics at L1 children? In other words, are the RIs associated with syntactic properties that indicate that the RIs are determined structurally (i.e., are truly non-finite) and are not the result of problems with inflectional morphology. As in Prévost & White (2000), the question of whether the maturation of certain language mechanisms brings an end to the RI stage is also crucial to this study. In addition, the contribution of L1 transfer to the L2 children's performance was studied.

To answer these questions, the authors analyzed properties associated with root infinitives in the spontaneous language production of two children learning French as an L2, Elisa (L1 German) and Lorenzo (L1 Italian). Elisa (aged 4;0; AoO = 2;8) and Lorenzo (aged 3;5; AoO = 2;4) had been exposed to their L2 at a French-speaking nursery school for 13 and 14 months respectively, at the time of the first recording. The children were recorded while they interacted with each other and data collection took place 5 times at intervals of 1 - 6 months. Based on the percentage of utterances and verbal utterances produced in French versus their respective native languages, the authors suggest that Elisa has a profile of an early L2 learner because she uses German in 38-60% of her utterances and has a higher percentage of verbal utterances in German in the early recordings. However, Lorenzo behaves more like a simultaneous bilingual because he uses more French than Italian in the first recordings and his percentage of verbal utterances in both languages is similar.

Elisa produces about 2% root infinitives out of all of the obligatory finite contexts in her data (7/375), which the authors conclude is too few to be considered a veritable RI stage.

Concerning the RIs that were produced, the co-occurring syntactic properties are similar to the L2 adults in Prévost & White (2000). Elisa produces RIs in wh-questions and subordinate clauses. Furthermore, her RIs are preceded by subject clitics. The pattern in Elisa's data is therefore better explained by the Missing Surface Inflection Hypothesis, because it appears that her RIs are more a problem with accessing the correct morphological form than a problem with missing projections in the underlying syntactic structure, as the Truncation hypothesis assumes. Lorenzo has no root infinitives from the first recordings and the authors claim that there is no evidence to show that he passed through a root infinitive stage.

Concerning L1 transfer phenomena, there was no real evidence for transfer in Lorenzo's data. Null subjects were not transferred from Italian and the *qui/que* alternation,[2] an area which differs considerably from Italian, is acquired without difficulty. For Elisa, there was almost no evidence of V2 transfer from German in Elisa's data. French does not have V2 and has VO order in main and subordinate clauses, so one could expect transfer effects. There are some examples of OV order, but the authors think this is due to a problem linked to object clitic placement because all cases of OV order involve an object pronoun, as in (2a-b).

(2)	a.	est-ce que je peux ça fini is it that I can that finished	
		'Can I finish that'	(Elisa, 1st recording)
	b.	tu peux pas ça faire	
		you can not this do.INF	(Elisa, 2nd rec., Belletti & Hamann 2004)

The target position for the strong pronoun *ça* (2a-b) is to the right of the infinitive *faire* (see Section 5.5.3.2 for more details on the properties of object clitics in French). However, the authors speculate that the preverbal target position of object clitic pronouns may have been behind the placement errors with the strong pronoun *ça*.

2.3.1.2.3 Granfeldt, Schlyter & Kihlstedt (2007)

Granfeldt et al. (2007) studied the acquisition of verb morphology in a group made up of 12 Swedish-French simultaneous bilinguals and Swedish children learning French as an L2. The children in this study began their exposure to French between birth and 6;7 years old. There were five simultaneous bilinguals (2L1) who grew up in families in which one parent spoke

[2] In French, there is an alternation in the form of the complementizer in subject (*qui*) versus object (*que*) relatives; whereas the equivalent complementizer in Italian has only one form (*che*).

French and the other Swedish. The other children had Swedish-speaking parents but were placed in a French-speaking pre-school at around 3-4 years or primary school at around 6 years old (child L2ers). The children were divided into two groups according to their AoO (2L1 and child L2). The 2L1 (*N* = 5) were exposed to both French and Swedish from birth and the L2 children (*N* = 7) had an AoO of between 3;5-6;7. The length of exposure ranged from 5;9-6;5 in 2L1 group and 0;7-3;0 in the child L2 group. At the time of testing, all children were between 5-7 years old. The child L2 and 2L1 groups were compared to two monolingual children, aged 6;3 and 6;5. Each child's proficiency in French was measured using MLU in words (using criteria from the Childes system, MacWhinney 2000) and a lexical diversity index.[3] Two child L2ers (LoE = 2 and 3 years respectively, and two 2L1 (CA (and thus LoE) = 6;4 and 6;5 respectively) had proficiency levels rated "higher" and the remaining eight children were rated "lower" (*N* = *4* child L2 and *N* = *4* 2L1).

The analysis of the finite and non-finite verbs in the spontaneous language of the population mentioned above revealed that the child L2 group patterned more like what has been observed for adult L2ers (Granfeldt et al. 2007 and references cited therein) in that they produced root infinitives with full DPs or clitic subjects (usually clitics). Four of the child L2ers with lower proficiency produced the following percentages of root infinitives with subjects: 14% (3/22), 25% (5/20), 28% (13/47), and 19% (8/42), respectively. One child L2er with lower proficiency produced no root infinitives[4] and the two child L2ers with higher proficiency produced root infinitives with subjects at rates of 2% (1/52) and 7% (2/30), respectively. This property of child and adult L2 grammars is absent from L1 and 2L1 grammars (except for one instance produced by a 2L1 child). These differences lead the authors to conclude that the child L2 group patterns more closely with adult L2 learners than (2)L1 learners.

2.3.1.2.4 Meisel (2008)

Meisel (2008) also made a very similar observation based on German-speaking children learning French before the age of about 4. He reported on a group of children selected from a larger population of children who were attending a French-speaking school in Hamburg (see also Meisel 2009).[5] This group included 14 children aged 5-10 years. Seven of these children spoke only German before enrolling in the school (child L2 group) and seven were from

---

[3] Here, lexical diversity (D) is computed on lemmas with VocD, a program in the CLAN toolbox (Malvern & Richards 2004).
[4] This child (Viola) does not use any non-finite forms, but rather uses the bare stem form in both finite and non-finite contexts.
[5] This project involves a longitudinal study underway at the University of Hamburg (see Meisel 2008, 2009).

French-German speaking homes and were therefore exposed to both languages from birth (2L1 group). The L2 children began their exposure to French upon their entry into preschool, at about the age of 3. French is the only language of instruction at the preschool (except for German lessons 5 times a week), but both languages are used once the children move onto elementary school at age 6. The AoO for the L2 children was between 2;9-3;8. They had been exposed to French between 2– 5 years at the time of the first recording.

Spontaneous data were collected from each child and analyzed for the use of finiteness and associated properties (e.g., the use of subject clitics with non-finite verbs). Results showed that some of the child L2ers displayed difficulty in producing targetlike finiteness, despite relatively long exposure to French (2-5 years). These children produced root infinitives that differed in important ways from those found in the 2L1 group. First, the RIs appeared in constructions such as subordinate clauses, which did not occur in the (2)L1 acquisition. Second, subject clitics were produced with non-finite verbs, a pattern that is absent in (2)L1 children. Four out of the seven child L2ers produced subject clitics with RIs; however, these did not appear often (less than 5 occurrences per child, estimated from Meisel 2008; Figure 2 p 63). These patterns led Meisel to conclude that the child L2 group differs in important ways from the 2L1 group concerning the use of finiteness in spontaneous language.

The conclusions drawn by Meisel (2008, 2009) and Granfeldt et al. (2007) differ from those expressed by Prévost & White (2000), Grondin & White (1996) and Belletti & Hamann (2004); however, it seems to me that the facts do not differ. Whereas Meisel and Granfeldt et al. argue that even a few occurrences of root infinitives with subject clitics are reason to consider fundamental differences between L2 children and simultaneous bilinguals, the Prévost & White (2000), Grondin & White (1996) and Belletti & Hamann (2004) argue that such a small number of occurrences amounts to a marginal phenomenon in these learners' L2 grammars. Although it is the case that TD L1 French-speaking children almost never produce subject clitics with non-finites, Rasetti (2003) reported that it can happen. Her analysis of longitudinal TD L1 data revealed that subject clitics were produced with RIs 13 out of 949 times (1.4%) (Rasetti 2003, p. 46), which, in my mind, makes it difficult to argue that L2 children who produce even a few occurrences of root infinitives with subject clitics are fundamentally different from 2L1.

2.3.1.2.5 Paradis, Le Corre & Genesee (1998)

In a study focused on a group of relatively older L2 children, Paradis et al. (1998) studied the spontaneous speech of 15 English-speaking children (mean age 6;7) learning French as an L2 in French-medium schools in Montreal. The majority of the L2 children's classmates were native French-speakers; therefore, these children were frequently exposed to naturalistic L2 input. The language samples were collected via structured interviews in which the research assistant asked a specific set of questions in order to elicit present, future, and past tenses. The children were at the end of grade one at the onset of testing, at which time they had had at least two years of exposure to French, and they were interviewed once a year for three years. The L2 performance was compared to a group of 10 native speakers in the same grade (TD L1; mean age 7;3).

The goal of the study was to examine the use of agreement and tense features by these children to determine if the categories AGRP and TP emerge together or separately. The target use of subject clitics, finite verb forms excluding the verb stem, and verb movement (as evidenced by the negative marker *pas* preceding non-finite, but following finite verbs) were analyzed as constituting evidence for the presence of agreement features in the grammars of these children. Past and future tense forms, as well as the 3rd person plural of a certain group of verbs[6] in the present tense were considered to be specified for tense features. The authors assumed the verb stem, which makes up a large part of the present tense verbal paradigm and is often considered a default form, to be unspecified for agreement or tense features (see Chapter 5 for full paradigm).

The use of the previously-mentioned properties in obligatory contexts was examined for each group. The results showed that the L2 and the control group did not differ in their use of verb movement and subject clitics across the three years. The L2ers produced more RIs than the controls, but their use was quite low across all three years. Furthermore, subject clitics were restricted to finite verbs in most cases in the L2 group.[7] However, the control group produced verb forms specified for tense (3rd person plural present tense, past and future tense) significantly more often than the L2 group at year one. Data collected during year two and

[6] A relatively few number of verbs mark different persons in the present tense in an audibly distinct manner in French. These include verbs with suppletive forms, such as the verb *aller* (*ils vont* 'they go'), or verbs in which the final consonant is audible in the 3rd person plural, such as the verb *prendre* (*ils prennent* [prɛn] 'they take'). See chapter 5 for more details.

[7] For year one, the L2ers used clitics with finite verbs 96% of the time on average (range: 89%-100%). At year 2, the mean rate was 98% (95-100%) and 98% (98-100%) at year three.

three revealed that the L2ers continued to use the 3rd person plural and future tense significantly less frequently than the controls.

Individual analyses performed within the L2 group on the properties assumed to carry a tense feature showed that more children used past tense productively[8] before future tense (only 60%, or 9/15 children, used future tense productively at year two versus 100% for past tense) and the 3rd person plural was still only used productively by 53% (8/15) at year 3, despite at least five years of exposure to French at this point. Based on these results, the authors conclude that the properties associated with agreement are acquired before tense. The dissociation between agreement and tense lends support to the idea that functional categories are not fully specified in L2 acquisition and that they are input driven, a result that supports an impairment in abstract features at certain stages in development (e.g., Minimal Trees account, Vainikka and Young-Scholten, 1994; 1996a; and the Valueless Features account, Eubank, 1993/94; 1994). However, other authors have pointed out that although the past tense emerges relatively early in monolingual acquisition of French, TD L1 French speaking children do not consistently mark the 3rd person plural on the relevant verbs until later in acquisition (Prévost 2009).

2.3.1.3 Verb morphology in child L2 English

The studies reviewed previously in this section involved the acquisition of L2 child French. In the remainder of this section, verb morphology in L2 child English will be discussed. The results for these studies are also important to the L2-SLI comparative approaches because they help identify potential areas of overlap with children with SLI or areas that may help distinguish L2 children from children with SLI. The findings from the studies discussed here also give us insights into the influence of L2 factors such as LoE and AoO. The interpretation of the data with respect to these factors will be discussed in Section 2.4.

The study of child L2 English is a major contributor to what is currently known about the emergence of inflectional morphology in child L2 learners (Gavruseva and Lardiere 1996; Haznedar 2001; Geçken and Haznedar 2008; Gavruseva 2008; among others). The general conclusions from these studies, which are often based on longitudinal spontaneous data from a small number of children (usually 1-3 individuals) in initial stages of L2 development, is

[8] The threshold for productivity was set at 30% suppliance of a given form in an obligatory context.

that the copula *be* is among the tense forms that are mastered first and the past tense *–ed* and third person singular ‘-*s*’ tend to emerge later.

2.3.1.3.1 Ionin and Wexler (2002)

Using cross-sectional spontaneous language and grammaticality judgment data, Ionin and Wexler (2002) studied the production of inflectional affixes (third person *–s* and past tense *–ed*) versus suppletive forms (BE auxiliary and copula) in L2 English by Russian-speaking children aged 3;9-13;10 (mean age = 8;4) who were living in the US. They were first exposed to English between the ages of 3;8 and 13;8. Their exposure to English at the time of testing ranged from 0;1-3;1. Analysis of the use of verb morphology revealed few omissions in the context of *be* forms compared to other affixes such as the third person present tense singular *–s*. Furthermore, although the L2 children often produced non-finite forms in finite contexts, they rarely omitted subjects and produced them using the correct case. Since TD L1 children in the optional infinitive stage consistently use null subjects, the authors conclude that these L2 learners are not in the optional infinitive stage, but that they have problems relating morphological forms to underlying structure, as predicted by the MSIH. These general conclusions are also in line with the case studies on L2 English children cited previously.

One interesting observation which was noted in particular by these authors and echoed by Gavruseva (2008) was that L2 children appeared to use a so-called ‘overgeneration of *be*’ or ‘extra *be*’, as in (3) from Ionin & Wexler (2002, p. 110).

(3) the lion is go down. (MA, sample 1, 7;4)

Observations such as these prove to be interesting in the comparison of L2 children and children with SLI. This idea will be revisited in Section 4.2 during the analyses of the same phenomenon in bilingual children with SLI.

2.3.1.3.2 Jia and Fuse (2007)

Jia and Fuse (2007) also evaluated the development of tense and non-tense morphemes in 10 L2 child and adolescent learners of English (L1 Mandarin). These children were 5-16 years old (mean age = 9;11; *SD* = 3;9) upon arrival in New York City. These children promptly began attending English-speaking schools in which over 70% of their classmates were native English speakers and at which time they began systematic exposure to English. Data collection began after three months of school attendance and took place sixteen times over a span of 5 years. Spontaneous language samples were analyzed for the following morphemes:

regular and irregular past tense, third person singular, copula BE, and auxiliary DO. Progressive aspect *–ing* was tested using an elicitation task in which the participant was asked to describe a picture in which an action taking place. Results revealed that after the 5 years of data collection, only the progressive *–ing* had been acquired (80% accuracy or higher across three consecutive testing sessions) by each of the participants. None of the participants achieved mastery of the regular past tense morpheme *–ed*. Performance on the other morphemes fell between these two: copula BE was mastered by 6 participants, auxiliary DO by 5, and irregular past tense by 4. Third person singular *–s* was the second most difficult structure, behind past tense *–ed*, and was mastered by 3 children. These results, which were obtained using longitudinal data, showed a somewhat similar pattern with the findings from Ionin and Wexler (2002): DO and BE were produced more accurately than third person singular *–s* and the past tense.

Summarizing, in this section, research concerning the development of verb morphology in French was reviewed as well as a brief overview of work with child learners of L2 English. This review has allowed us to understand some developmental patterns in the verbal domain in L2 children. For instance, analysis of verb morphology in L2 children in French and in English has shown that a variety of forms associated with the IP domain are attested relatively early in L2 child acquisition, even if targetlike morphemes are not used consistently. Jia & Fuse's (2007) study demonstrated that non-target use of tense morphology can continue in L2 children, even after five years of exposure and even when AoO is relatively early. The results of these studies will be revisited in Section 2.4 during the discussion of internal and external factors in L2 acquisition.

The studies on French-speaking L2 children reveal somewhat mixed results concerning the extent to which L2 children pass through an RI stage in child L2 French. Prévost and White's (2000) study suggested that the L2 children in their study did pass through an RI stage that shared many of the same properties as L1 children. However the studies by Granfeldt et al. (2007) and Meisel (2008) found that the RIs produced by the L2 children were different from what has been shown for TD L1 children, which these authors claim is due to a later AoO. However, in my opinion, differences in these results could also be due to differences in CA and LoE, which may suggest that the L2 children in these different studies were not in the same stages of development at the time of data collection. The study by Paradis et al. (1998) revealed that subject-verb agreement was acquired quite early and used accurately, whereas certain tense forms like the future tense and the 3rd person plural form of the present can take at least 5 years of LoE before being used productively.

The work on child L2 English reviewed here and the data from Elisa, the L2 French child from Belletti & Hamann (2004), support the MSIH. These L2 learners show that they have access to abstract syntactic categories via the suppliance of subjects in the correct case and the accurate production of tense on suppletive morphological forms. Their performance suggests that missing inflection is not structurally determined, but linked to a problem with accessing target morphology. Lastly, the effects of L1 transfer were minimal: L2 children with different L1s exhibited similar developmental patterns.

2.3.2 Object clitics

This section presents studies that have examined the development of object clitics in French. There is considerable debate about the status of object clitics in French and in romance languages in general (see Chapter 5 for more details). Whether the analysis adopted assumes movement (Kayne 1975), agreement marker status (Auger 1994) or a compromise between the two (Sportiche 1992), subject and object clitics are assumed to be associated with a functional projection in the verbal domain. In French, object clitics precede the finite verb; whereas objects in the form of lexical DPs and strong pronouns such as *ça* ('that') follow the verb (see Table 2.1 for strong pronouns).

Table 2-1. Accusative Clitics and Strong Pronouns in French.

	Accusative clitics	Strong pronouns
1 sing	me	moi
2 sing	te	toi
3 sing masc	le	lui
3 sing fem	la	elle
1 pl	nous	nous
2 pl	vous	vous
3 pl masc	les	eux
3 pl fem	les	elles

The L2 acquisition of object clitics in the context of an L1 that does not have syntactic clitics and in which object pronouns appear in postverbal position represents a situation in which L1 transfer has the potential to interfere with L2 development. Furthermore, object clitics are acquired late in TD L1 acquisition. Therefore, studying object clitics allows for the observation of the emergence of an element which is associated with functional categories, could be affected by interference from the L1 (in the case of L1 English-L2 French) and is also acquired late by typically-developing monolingual children. However, understanding the contribution of each of these factors in the development of object clitics is a formidable task (see Section 3.3.2 for a similar discussion in the context of SLI).

2.3.2.1 White (1996)

White (1996) used Kenny and Greg's data, the L1 English-L2 French learners described in the Prévost & White (2000) study, to examine the use and placement of object clitics. In English, there are arguably no syntactic clitics (but see Schwartz 1999 for a different point of view) and object pronouns appear in postverbal position, unlike French. The focus of White's study was the emergence of accusative clitics.[9] Accusative clitics are very rare until month 11 for both Kenny and Greg.[10] The strong pronoun *ça* (4) precedes the use of accusative clitics and becomes less frequent as accusative clitics become more productive. At the same time that accusative clitics are present in the data (5), they are also omitted quite frequently (6).

(4) le papa-vache fait ça
the father-cow does that (Kenny, month 5)

(5) on le laisse comme ça
we it leave like that (Greg, month 11)
'We'll leave it like that.'

(6) j'ai encore fait trop grand
I've already made (it) too big (Greg, month 5, White 1996)

There were also cases of errors in the position of the object clitic relative to the verb in the data, although these were much rarer than omission errors (7).

(7) moi j'ai trouvé le
me I.have found it (Greg, month 14)

A substantial increase in object clitics occurred with both children between months 20 -25. White interprets the patterns in the data as evidence that, overall, Kenny and Greg have correctly analyzed object clitics in French. This conclusion also means that the functional

[9] See chapter 5 for a more detailed analysis of the various types of clitics in French.
[10] Direct objects (lexical DPs or the strong pronouns *ça*) were not produced until month 7, so there were few contexts for accusative clitics before this point.

categories associated with clitics are present in initial stages of acquisition, despite the fact that the L1 does not have the same clitic projections.

2.3.2.2 Belletti & Hamann (2004)

Belletti & Hamann (2004) also analyzed the emergence of object clitics in the spontaneous data of Elisa and Lorenzo (see above). When object clitics first emerged in Elisa's data, they occurred in non-clitic positions. In the second recording (age, 4;2; LoE 16 months), Elisa produced 4 object clitics that were all in non-target positions (example in (8)).

(8) non, on laisse le
no one leaves him (Elisa, 2nd recording)

In German, Elisa's L1, the pronominal system has demonstrative pronouns that share the same form as the definite determiner, just like the homophony between French object clitics and definite determiners. This shared phenomenon may have led to a misanalysis of French object pronouns as having both clitic and strong pronoun status. These position errors involving object clitics are resolved by the fourth recording. Elisa does not appear to omit many object clitics. Across the five recordings, she omits 6 out of 130 complement contexts (4.6%). Elisa's performance is similar to TD L1 children concerning the dissociation between subject and object clitics, but the authors point out that both subject and object clitics emerge more gradually in TD L1 children and position errors with respect to object clitics are never found (e.g., Hamann et al. 1996).

In Lorenzo's data, object clitics are present from the first recording (age, 3;6; LoE 13 months). He also produces fewer object clitics than subject clitics; however, unlike Elisa, his object clitics are targetlike, with no placement errors attested in his data. In all of his data, he omits only one object clitic. The authors attribute the differences between the two children to several factors which will be discussed in Section 2.4.1.2.

2.3.2.3 Haiden (2011)

Haiden (2011) looked into the elicited production of object clitics in French by a group of English-speaking children who were attending school in France.[11] The L2 group was aged 6;4 – 13;1 years (mean age = 9;7) and were first exposed to French at 4;6 – 10;10 years (mean AoO = 7;1). At the time of testing, they had been exposed to French for 0;9 – 4;5 (mean =

[11] Most of the L2 children in Haiden's study are part of the population of this thesis. See Chapter 5 for more information about these L2ers.

2;6) years. The L2 group performance was compared to four monolingual typically-developing (TD) control groups: 1) 14 4-year-olds (TD4); 2) 12 6-year-olds (TD6); 3) 12 8-year-olds (TD8); and 4) 12 11-year-olds (TD11).

The experimental task had been previously used with L1 children and children and adolescents in various atypical acquisition contexts (SLI, hearing loss, Rolandic epilepsy, see Tuller et al. 2011). During the test, the experimenter shows a picture depicting an action to a child and prompts the child to respond to a question in which the use of an object clitic is required, as in (9). The probe contains 32 items in all and targets first and third person nominative, reflexive, and accusative clitics.

(9)	Experimenter :	Que fait Marie avec le chien? what does Mary with the dog 'What's Mary doing to the dog?'
	Expected response:	Elle le lave. she it washes 'She's washing it'

Concerning the rate of suppliance of the accusative clitic, the results showed that the L2 group produced third person accusative clitics at significantly lower rates than the TD8 and TD11 groups, but did not differ significantly from the TD4 and TD6 groups. The L2, TD4 and TD6 groups omitted accusative clitics, however. For the first person accusative, both TD4 and L2 group mean production rates were around 80%, while the TD6 mean rate was 90%. The TD4 group produced third person accusative clitics about 75% of the time and the TD6 at 80%, compared to a mean rate of 60% for the L2 group. The lack of significant differences appears to be due to very high standard deviations in all groups. A somewhat unexpected result concerned reflexive clitics. Although previous research has shown that reflexive clitics are acquired before accusative clitics in TD L1 acquisition, reflexive clitics were the only clitic type that distinguished the L2 group from all other TD groups, including the 4-year-olds. The L2ers supplied reflexive clitics in roughly 75% of obligatory contexts; whereas the TD children were more or less at ceiling for this clitic type. Haiden hypothesized that L1 transfer could explain the lower performance in the L2 group. Following Marelj (2004) and Reinhart & Siloni (2005), Haiden adopted the analysis which considers that French reflexives are derived in syntax; whereas in English they are derived in the lexicon. If the L2 children transfer this lexically-based derivation to French, then they should be expected to omit reflexive pronouns. I will return to the discussion of these results and their link with LoE in Section 2.4.2.2.

2.3.2.4 Chondrogianni (2008)

The acquisition of clitics by L2 children with other languages has also been explored. For example, Chondrogianni (2008) compared the acquisition of object clitics in L2 child and adult learners of Greek (L1 Turkish). Greek has object clitics which appear in preverbal position and are sensitive to certain pragmatic constraints which allow them to be omitted in specific contexts, as is the case in French as well as Portuguese. Turkish has strong pronouns which are full DPs and allows null objects. The L2 participants included 79 children aged 7-12 and 30 adults aged 19-46. The L2 children belonged to monolingual Turkish families and were first exposed to Greek when they entered the school system (5-6 years old). At the time of testing, the L2 children had been exposed to Greek for 1-2 years. These children attended minority private schools in which both languages are used equally for instruction. The L2 adults were Turkish immigrants to Greece and the adults began systematic exposure after age 12 (range=12-33) and had been exposed to Greek for 12-33 years. The L2 children and adults were placed into subgroup according to proficiency level, which was evaluated using spontaneous language measures including verbal density (verbs/T-unit), lexical diversity, and ratio of error-free utterances. The number of L2ers per proficiency group is as follows: 1) Low: 10 children and 6 adults; 2) lower intermediate: 30 children and 9 adults; 3) upper intermediate: 30 children and 8 adults; 4) high: 9 children and 7 adults. The L2 children were compared to a group of 18 MLU-matched L1 Greek children (six 3-year-olds, six 4-year-olds, six 5-year-olds) and an aged-matched group (thirty 7-11-year-olds). The L2 adults were compared to a group of 10 L1 adults aged 27-55. The adult and child comparison will be reviewed in Section 2.4.1.2. The concentration in this section is on the child L2 data.

The L2ers' performance on story-telling, act-out, and elicited production tasks constituted the empirical base for this study. The object clitics results on the story-telling and elicitation production tasks will be discussed here. The story-telling task was based on the Frog Story task (Mayer 1969), in which the participant is asked to tell a story based on a series of pictures. During the elicitation production task, the experimenter acted out a story between two animal characters. The child was then prompted to respond to the question "What is X doing to Y?, which created a context for the use of an object clitic.

In the story-telling task, L2 children produced significantly fewer object clitics than the MLU-matched controls and significantly more DPs in clitic contexts, but they did not differ from the controls with respect to null objects. However, the L2 children differed from their age-matched peers for all three measures, producing significantly fewer object clitics and more null objects and DPs. As proficiency increased, so did the production of clitics. The number of DPs decreased with proficiency, but there was no effect of proficiency on the rate of null clitics. For the elicited production task, L2 children in the 'high' proficiency group produced clitics, DPs, and null objects at rates similar to those of the MLU-matched controls. However, the performance of the L2 children from the lower proficiency levels differed significantly from MLU controls for all three measures. When compared to age-matched controls, all L2 children produced significantly fewer clitics and more DPs and null objects.

Summarizing, the development of object clitics in L2 development has received considerable attention because this property can be informative with respect to the role of L1 transfer as well as provide evidence for the status of functional categories, given that they are associated with finiteness. L2 children were shown at times to resemble L1 children with respect to the asymmetry in the emergence of subject and object clitics and in the omission of object clitics. Kenny (L1 English), Greg (L1 English), and Elisa's (L1 German) spontaneous language data revealed errors in clitic placement, but these were very rare. Although it was suggested that L1 transfer was behind Elisa's placement errors, the low frequency of these placement errors indicates that the development of object clitics was not strongly influenced by the order of the verb and the object pronoun in the L1.

Omission was the most frequent error concerning object clitics in spontaneous language. However, the results from the elicitation tasks reported here showed that L2 children often used lexical DPs instead of object clitics. Moreover, it is interesting to note that the use of lexical DPs instead of clitics occurs frequently in elicitation tasks, but is not reported in spontaneous language data. Why should this be so? One could speculate that the methods used to elicit object clitics are somehow not entirely adapted for the elicitation of object clitics in certain learners. It is possible that certain pragmatic factors necessary for the elicitation of object clitics in L2 learners are not present in the type of elicitation methods mentioned in this section, but that these factors are present in the context of spontaneous language.

2.3.3 Gender

The acquisition of gender agreement by L2 learners of French has been very well researched in adult populations, given their well documented difficulty with this aspect of L2 learning (see Ayoun 2008 and White 2003 for a review). Gender agreement has received relatively little attention in L2 child populations compared to adults. In this section we will review studies which have investigated how grammatical gender develops in L2 child and bilingual populations.

2.3.3.1 Grondin & White (1996)

In the Grondin & White (1996) study cited above (Section 2.3.1.2.1), these authors also reported on the evidence for the presence of the category DP in Kenny and Greg's spontaneous language. While determiners were produced most of the time when required, unlike the frequent determiner omission observed in early TD L1 development (Clark 1985), there was a high rate of gender errors (as in (10)). The mean rate of determiners with incorrect gender marking for the entire period under observation was 20%.

(10)	C'est	une	grosse	accident.	
	it's	a-FEM	big-FEM	accident (MASC)	(Kenny, month 2)

2.3.3.2 Meisel (2009)

Meisel (2009) studied the spontaneous language of a group of 10 L1 German-L2 French children who were acquiring French in a French-speaking preschool in Hamburg.[12] The AoO for these children was between 3;0-3;8. They had been exposed to French between 16 – 29 months at the time of the first recording. Following an initial analysis of the use of verb morphology, six of these ten children were labeled child L2 learners, as opposed to simultaneous bilinguals (2L1), because their use of verb morphology shared characteristics of what has been observed in adult L2 learners. The children labeled L2 happened to have been exposed to French at 3;7 or older, with the exception of one child exposed at 3;03.

The results showed that both the 2L1 and L2 children frequently omit determiners and all but two 2L1 children make gender agreement errors on determiners (including the overuse of both genders). However, as the author points out, the frequency of errors is not a crucial factor, but

[12] These children represent a subset of the group from a longitudinal study underway at the University of Hamburg (see section 2.3.1.2.4). The gender data analyzed for this study came from the children's first recording only.

more weight should be given to the types of errors that are made. The criteria used by the L2ers to assign grammatical gender could not be deciphered by the author. The L2ers did not appear to use the formal properties of nouns, which have been shown to provide clues to gender (Tucker et al. 1977). Furthermore, semantic gender was not systematically respected, as examples like: *le madame* 'the.masc lady'. Finally, transfer from German, which has three forms of grammatical gender: masculine, feminine and neuter, could not account for the patterns observed either. Meisel therefore concludes that the L2 children learn gender in a word-by-word fashion, instead of associating nouns to a gender class, a strategy characteristic of adult L2 learners. The performance of the 2L1 compared to the L2 children will be discussed in Section 2.4.1.3.

2.3.3.3 Granfeldt et al. (2007)

Granfeldt et al. (2007), in the same study mentioned in Section 2.3.1.2.3, examined gender agreement on determiners and adjectives[13] in the spontaneous speech of 14 Swedish-French simultaneous bilinguals (2L1) and Swedish-speaking children acquiring French as an L2 (child L2). The French and Swedish gender systems are different in some ways, but they are similar in that determiners and adjectives must agree in gender with the nouns they modify (see Granfeldt 2003).

The child L2 group had the highest error rate for gender agreement (M = 21%, SD = 4.7%, range = 13 - 25%). Those child L2ers with lower proficiency had generally higher error rates with respect to gender (19-25%). The authors concluded that the child L2 group patterned more closely with adult L2 learners. The child L2 group differed from the simultaneous bilinguals, but the latter also differed from the monolingual controls for gender marking. The 5 2L1 children produced gender errors at a rate between 0-18% (only one 2L1 child produced 0%); whereas neither of the monolinguals made any gender errors.

2.3.3.4 Hulk (2007) and Unsworth (2008)

In a study comparing the acquisition of gender in Dutch and in French, Hulk (2007) tested gender marking on the definite determiner in children acquiring both of these languages. The gender systems in Dutch and French are similar in that they both have a two-way gender system (masculine and feminine for French and common and neuter for Dutch) which is marked on the definite determiner (among other elements). Although some clues exist in both

[13] There were very few adjectives found in the data, so the results essentially reflect gender marking on articles.

languages as to the appropriate grammatical gender of a particular noun (e.g., the form of French noun endings and the diminutive suffix *je* in Dutch), in general, learners must learn the gender of nouns on a case by case basis (Carroll 1999). There are also important differences between the gender systems of these two languages. In Dutch, the common gender is the undisputed default, while neuter is the marked form and is much less frequent. Some have argued that masculine is the default in French (Ayoun 2008), but the situation is much less clear compared to Dutch. Furthermore, the gender distinction in French is much more balanced in terms of the frequency of masculine versus feminine nouns; whereas the common gender is by far more frequent. In monolingual acquisition, gender agreement in French is acquired with relative ease by about 3 years of age (Clark 1985); whereas the neuter/common distinction in Dutch is not mastered until at least 6 years (see Hulk 2007, Unsworth 2008 and references cited therein).

The goal of Hulk's study was to examine cross-linguistic influence in the bilingual acquisition of gender. The principal research question asked if the bilingual acquisition of two languages with (rather) similar gender systems allows grammatical gender to be acquired more quickly in both systems. For example, would bilingual children acquiring French and Dutch experience "acceleration effects" in the acquisition of the neuter gender in Dutch under the influence of the gender system in French?

The participants in Hulk's study were 28 children aged 4;5-7;11 from French-speaking families who were living in the Netherlands and attending French school in The Hague. They were first exposed to Dutch between birth and 4 years old. Eleven of these children were tested in French and 17 were tested in Dutch. Semi-spontaneous speech was collected using a picture description test (Dimroth 2001).[14] The results for French revealed one error out of 275 definite determiners. For the Dutch results, the common definite determiner *de* was produced correctly 100% of the time. However, only 30% of neuter nouns were preceded by *het* (out of 109 total neuter nouns produced). There were no observed age effects on accurate gender marking in Dutch.

Hulk compared these results to the spontaneous language of two simultaneous French-Dutch bilingual girls, Anouk (aged 3;1.4-3;10.7; MLU=3) and Annick (aged 3;1.26-3;5.8; MLU=3). In Dutch, both Anouk and Annick overused *de* in the context of neuter nouns, where *het* is

[14] This task was originally developed to elicit topic-related particles. However, the author analyzed production of definite determiners that were used during the course of this task.

expected. Their performance was similar to monolingual Dutch children of the same age. For French, Anouk produced incorrect gender marking on definite determiners 1.7% (9/563) of the time, which is comparable to other monolingual French-speaking children of the same age. However, Annick makes more errors in French, overgeneralizing the feminine with masculine nouns 26 times and overgeneralizing the masculine only twice (28/82, 34%, 26 errors were *la*.FEM instead of *le*.MASC). Hulk compared Annick's pattern to some of the German-speaking children learning French studied by Möhring (2001). The children in Möhring's study were first exposed to French between the age of 2;10 – 3;7 and their accuracy with respect to gender marking varied considerably compared to what is observed in monolinguals. The mean error rate for gender marking on the definite determiner in spontaneous language was between 0-36% and 14-46% for the indefinite determiner (Möhring 2001, cited by Granfeldt et al. 2007).

Given the interesting status of *het* in the variety of Dutch spoken in certain communities in the Netherlands, Unsworth (2008) set out to investigate how a different set of L2 learners might acquire the neuter/common distinction in Dutch. She analyzed the semi-spontaneous data of 103 L2 Dutch learners (L1 English). These individuals were exposed to Dutch in a different context compared to previously studied learners with L1 Turkish or Moroccan. Subgroups were formed according to age of onset. There were 58 L2 Dutch children,[15] 19 L2 preteens,[16] and 26 L2 adults.[17] Results showed that these sets of learners also struggled to master this gender distinction. Interestingly, no chronological age or AoO effects were observed; however, proficiency was correlated with the rate of correctly produced *het*. The vast majority of these L2 learners overgeneralized *de* with neuter nouns, but a couple of learners opted to use *het* as a default.

2.3.3.5 Gathercole (2002)

Gathercole (2002) studied the acceptance of correct grammatical gender marking in Spanish using an oral grammaticality judgment task. The participants in her study were 101 Spanish-English bilinguals from the Miami area, who were part of a large-scale study on bilingual

[15] For the L2 children, AoO: birth to 7;3 (M = 4;10, SD = 1;9), age at time of testing from 5;3 to 17;4 (M = 10;5, SD = 3;8) and LoE: from 0;11 to 15;2 (M = 5;6, SD = 3;8).
[16] For the L2 preteens, AoO: from 8 to 12;4 (M = 9;6, SD = 1;7), age at time of testing from 9;8 to 18;5 (M = 12;0, SD = 2;4) and LoE: from 0;2to 7 years (M = 2;5, SD = 1;11).
[17] For the L2 adults, AoO: 21 to 43 years (M = 27;3, SD = 5;3), age at time of testing from 22;2 – 50;0 (M = 34;4, SD =8;0), and LoE: from 0;4 to 27 years (M = 6;9, SD = 6;8).

development and education.[18] These children were born in the US into Hispanic families and were divided equally into eight separate groups according to socio-economic status (SES),[19] the type of school attended (two-way or English immersion)[20] and languages spoken at home (Spanish only or both English and Spanish). For example, one out of the eight groups was comprised of children with low SES status, attending a two-way school and who spoke only Spanish at home. All children had been exposed to Spanish from birth, but the assumption is that children in Spanish-only homes were not exposed to English consistently until kindergarten (around 5 years old). Eighty second-graders (7- and 8-year-olds) and eighty fifth-graders (10- and 11-year-olds) participated in this study (10 in each group). Monolingual control groups were comprised of sixteen native Spanish-speaking second-graders and sixteen native Spanish-speaking fifth-graders. The monolinguals were Peruvian and came from families with high SES backgrounds. The study design was cross-sectional, but the differences between the second and fifth graders were interpreted as representing changes over time within the same population (see Oller and Pearson 2002 for complete details of the entire study).

To test grammatical gender in Spanish, Gathercole used a grammaticality judgment task in which the children were asked to listen to a puppet who “sometimes doesn’t know how to say things right.” The puppet produced either a grammatical (11a) or ungrammatical sentence (11b) and in response, the child was to let the puppet know if the sentence sounded all right, and if not, to correct it (Gathercole 2002, p. 177). The types of nouns included in the task were as follows: -*e* nouns, -*a* nouns that are masculine, -*o* nouns that are feminine; -*a* nouns that are feminine but take the masculine (*el*) article because they begin with a stressed /a/. There were two nouns of each type (one masculine and one feminine) and one occurred in a grammatical while the other occurred in an ungrammatical sentence.

---

[18] The participants in the study were in kindergarten, second, and fifth grade. The total population numbered 952 children (Oller and Pearson 2002, p 27).

[19] SES status was decided based on a family questionnaire filled out by potential study participants. The questionnaire targeted information such as parental education history, occupation in the home country and in the US, family income, number of children and adults living at home, parents’ aspirations for their children’s level of schooling and estimates of the likelihood that these would be met (Oller and Pearson 2002, p 34).

[20] Two-way schools refer to a category of elementary schools in which content is taught in both English (60%) and Spanish (40%). In English immersion schools, all classes are taught in English, except Spanish language classes (Oller and Pearson 2002).

(11) a. Dame une parte de tu bocadillo.
‘Give me part of your sandwich’

b. Había escrito su nombre en *la sobre.
‘[S/he] had written his/her name on the envelope’

The monolingual group was significantly better at recognizing ungrammatical sentences than the bilinguals, but both groups were at ceiling for the grammatical items. The bilingual fifth graders had significantly better performances than the second graders for this task.

2.3.3.6 The Role of L1 Transfer in the Acquisition of Gender

Following the Failed Functional Features Hypothesis (Hawkins and Chan 1997) account of adult L2 acquisition, Hawkins & Franceschina (2004) hypothesized that the *u*gender feature could not be acquired after a certain age. The idea behind this account is that adult L2 learners are unable to acquire features in the L2 that differ from the L1. This representational deficit in the adult L2 system was used to explain the difficulty that L2 learners of French and Spanish (L1 English) have in correctly marking gender in production. This hypothesis stemmed from the larger account called the Failed Functional Features Hypothesis. Adopting Carstens’ (2000) analysis, these authors assume that gender agreement results from the checking of an uninterpretable gender feature during the derivation. L1 speakers of languages such as French and Spanish acquire this feature as part of the lexical entry for a specific noun; however, the authors hypothesize that older L2 learners of languages that do not have this feature activated (such as English) will not acquire it. Therefore, these L2 learners continue to incorrectly mark gender, even after becoming very proficient. Support for this hypothesis comes from a comparison of gender marking accuracy in the spontaneous language of three adult Italian-speaking and three English-speaking learners of Spanish, each of whom were very proficient in their L2. Although all learners did very well with gender agreement, the L1 English speakers had an error rate of 8% (10/119 total determiner-noun agreement contexts). However, according to Hawkins and Franceschina, L2 children are predicted to behave like L1 children because the activation of the *u*gender feature depends on the age of acquisition.

However, work with adults whose age of first exposure was during or after adolescence has revealed that these learners have similar performance with the gender system of the L2, regardless of the gender system of the L1. Bruhn de Garavito and White (2002) showed that native French speakers with low to intermediate proficiency in L2 Spanish used a default gender and had more difficulty with indefinite determiners. The same phenomena had been described for L1 English speakers of L2 French and Spanish (see White 2003 for a review). Using a picture-identification task, White et al. (2001) showed that advanced and intermediate L2 learners of Spanish with French or English as an L1 all had high performance with respect to gender marking. Since French and Spanish both have the *u*gender feature activated and French speakers struggle with gender in L2 Spanish, the role of the L1 should not be the decisive factor in acquiring gender in an L2. These results support the Missing Surface Inflection Hypothesis, which claims that the difficulty demonstrated by L2 learners, both child and adult, does not result from a deficit in the underlying syntactic structure, but stems from a problem in accessing correct morphological forms. In other words, the abstract representations are intact, but the morphological form may not be produced in a target-like fashion, most likely due to processing issues (White 2003; Montrul 2008a).

Summarizing, studies on the acquisition of gender by L2 children and simultaneous bilinguals reveal a certain amount of variability among learners in similar acquisition contexts. Although the masculine determiner is argued by some to be the default gender in French, the children acquiring French as an L2 in the studies reviewed here often overused the feminine. However, as mentioned by Prévost (2009), the vast majority of studies done on L2 children has relied on spontaneous data and has looked solely at the definite determiner. Therefore, more research is required to better understand the role of the L1 in L2 gender acquisition and, more generally, how L2 children acquire gender and whether this is fundamentally different from monolingual children or adult L2 learners. The role of L1 transfer in L2 acquisition of gender is unclear. Both Meisel (2009) and Granfeldt et al. (2007) studied children with gender systems in their L1 and both authors observed difficulty in gender agreement in the L2 French of these children. However, Hawkins & Franceschina (2004) reported that L2 learners of Spanish who had L1s with grammatical gender systems (Italian) had better performance than L2 learners of Spanish with English as their L1. The differences between these studies may be linked to the type of data collection used (spontaneous production versus comprehension).

The research reviewed here indicates that children acquiring French as an L2 who have L1s with grammatical gender (e.g., Dutch, Swedish) do not necessarily acquire gender in an error-free manner. Furthermore, simultaneous bilinguals do not acquire gender distinctions more quickly if gender is instantiated in both of their languages. Overall, this confirms the previous results found notably by White and colleagues which suggest that the L1 does not play a crucial role in the successful acquisition of the L2 gender system.

2.3.4 Syntactic Structures in Child L2 Development

The previous sections concentrated on the development of specific morphosyntactic properties that have received considerable attention in the child L2 literature. Certain investigators have argued that these properties (verb morphology, object clitics and gender agreement) can be used to distinguish different types of L2 French acquisition (e.g., a simultaneous bilingual from a sequential bilingual) (see "diagnostic features" Granfeldt et al. 2007, p. 12; Meisel 2009). However, certain types of syntactic constructions have received less attention in the literature. This section discusses studies regarding constructions which involve syntactic operations such as embedding and movement. These structures have generally been found to be acquired later in typical L1 acquisition and may continue developing after age 4. They have also been argued to entail greater computational complexity (see Chapter 5), because of movement and/or embedding, i.e. more instances of Merge. Therefore, it is interesting to see if the use of Merge in a given construction in the L1 helps the L2 child acquire structures derived by movement more quickly in the L2 or if such structures would be avoided in order to alleviate processing demands. The focus in this section will be on wh-question, subordination, and scrambling in various languages.

2.3.4.1 Emergence of CP in L2 child French

In addition to analyzing the emergence of IP and DP phenomena in the French of the L2 children (L1 English) Kenny and Greg (see Section 2.3.1.2.1), Grondin and White (1996) also documented the emergence of structures involving a CP projection, such as embedded clauses and wh-questions. They reported that CPs introduced by complementizers were first observed in month 9 for Kenny (chronological age, 6;4; LoE, 9) and month 14 (chronological age, 6;6; LoE, 14) for Greg.

The child Elisa studied by Belletti and Hamann (2004) (Section 2.3.1.2.2) produced embedded clauses at 10%, the same rate as L1 children her age from the second recording, at which time she was aged 4;2 with 16 months exposure to French. At the same time, she also produced 10% subordinate clauses in German. Her embedded clauses included overt complementizers. Concerning wh-questions, the first to appear are wh-in situ (as in 12a) or fronted interrogatives with *qu'est-ce que* (as in 12b). The picture for Lorenzo is similar: He produces subordinate clauses from the first recording (aged 3;5, LoE, 13 months). For wh-questions, Lorenzo used both fronted and *in situ* strategies in French in a target-like fashion; whereas Italian does not allow wh-words to remain *in situ*.

(12) a. ça va par ou ?
that goes to where
'where does it go?' (Elisa, 1st recording)

b. qu'est-ce que tu dis ?
what is it that you say (Elisa, 2nd recording)

2.3.4.2 Emergence of CP in L2 child English

In an investigation on complementizers in L2 child English, Lakshmanan and Selinker (1994) reported on two 4-year-old children, Marta (L1 Spanish) and Muriel (L1 French). Data was collected between the ages of 4;6 and 5;1.15 for Marta and between 4;9 and 5;8 for Muriel. Two older L2 children, Jorge and Juan (L1 Spanish, L2 English) were also part of the study. These individuals were recorded from ages 12;0 to 13;0 and from 10;8 to 11;10 years, respectively. The authors do not provide any information concerning the LoE of these children at the onset of the recordings. Other studies suggest that Muriel had approximately 3 months (Lakshmanan 1991) and Marta, Jorge and Juan each had 1 month (Cazden et al. 1975), which corresponds to their time spent in the United States before the onset of the study. However, it remains somewhat unclear as to when exactly exposure to the L2 began, given that Juan, Jorge and Marta had some contact with English before moving to US (Cazden et al. 1975).

Various biclausal structures emerged relatively early in the data and continue to be produced consistently throughout the testing period. For example, infinitival complements of verbs such as 'want' are also produced fairly early (as in 13).

(13) I don't want to play with you. (Muriel, sample 3)

Tensed biclausal declaratives (14a-b) and indirect questions (14c) are produced beginning as early as sample 3 and are produced consistently afterwards. These two learners produce null complementizers in legitimate contexts most of the time in English (14a-b) despite the fact that null complementizers are not allowed in their respective L1s.

(14) a. I wish I could help you. (Muriel, sample 8)
b. I forgot I need a book. (Marta, sample 12)
c. I don't know what I'm going to do. (Marta, sample 7)

Conditional clauses (15) are attested as early as sample 7 and occur in all following samples.

(15) If you don't win, I'll get one of yours. (Marta, sample 10)

Relative clauses (16) also emerged fairly early (sample 2 for Muriel and 7 for Marta). However, some of the earlier subject relative clauses lack an overt complementizer or wh-operator, which is ungrammatical in English (16a).

(16)	a.	And it's the goose has to run.	(Marta, sample 11)
	b.	I have a friend who's go with me every day.	(Marta, sample 9)
	c.	I want one thing you have here.	(Marta, sample 7)

For Juan, biclausal structures were produced consistently from sample 1 and for Jorge from sample 5. Juan produced relative clauses (both subject and object) consistently beginning at sample 3 and for Jorge at sample 8. Juan and Jorge pattern with Muriel and Marta in that they also use a null a wh-operator and null operator in subject relatives. These four children first used *that* as relative complementizer before using it as a complementizer in embedded clauses. Since French and Spanish require overt complementizers in equivalent structures, L1 transfer does not appear to influence this part of development. Crucially, for the purpose of the current study, the data show that the spontaneous language samples contain frequent examples of clausal embedding.

Gavruseva and Lardiere (1996) also examined the emergence of CP in the spontaneous language of an 8-year-old Russian-speaking child (Dasha) learning English as an L2. Dasha began her exposure to English at 8 years and had two months of exposure to English at the time of the first recording. She was recorded ten times over a period of six months. This L2 child produced embedded clauses with a null complementizer from the third session (17a-b), at which time she had been exposed to English for two and a half months. She produced overt complementizers during the fourth recording (18). While the number of embedded clauses increased from 4 (file 4 to 18 (file 6), verb morphemes were supplied inconsistently during the same recordings. Her production of agreement marking remained low (roughly 40% in files 7-9) after CP had emerged.

(17)	a.	look what she doing	(Dasha, file 3, LoE = 0;2)
	b.	I know I eating you	(Dasha, file3, LoE = 0;2)

(18) Mama know that we go outside (Dasha, file 4, LoE = 0;3)

Another study on the acquisition of CP-related phenomena in L2 English was carried out by Haznedar (2003). She analyzed the spontaneous language of an L1 Turkish boy named Erdem. He had been exposed to English at a nursery school for one and a half months at the beginning of the data collection period and was aged 4;3 at the first recording session (AoO, 4;1.15). Erdem began producing infinitival complement clauses with *want* after about 4;5 months of exposure (session 10) and clauses with *because* and *if* at around 7;5 months exposure (session 15), these embedded clauses continued to be used consistently thereafter. As was the case for Dasha (Gavruseva & Lardiere 1996), Erdem continues to omit the third person singular *–s* and past tense markers in obligatory contexts well after his acquisition of the CP domain.

The general picture that emerges from the findings on the emergence of CP is that L2 children have relative facility with syntactic structures such as clausal embedding. These types of structures often emerged within a couple of months after the beginning of exposure to the L2. However, these same learners continued to produce non-target inflectional morphology well after clausal embedding was observed. This dissociation between syntactic structure and verb morphology has been documented in L2 adult learners (Lardiere 1998; 2000; Prévost & White 2000) and in L2 children (Domain by Age Model, Schwartz 2004, see Section 2.2.3). The findings discussed in this section demonstrate that L2 children are capable of using clausal embedding, suggesting that these learners have immediate access to the syntactic operations that underlie subordination. However, at the same time that the L2 children produce subordinate clauses, errors in inflectional morphology are prevalent. As stated previously, the MSIH accounts for this dissociation between morphology and syntax by stating that errors in morphology are the result of difficulty mapping morphological surface forms to underlying syntactic structure.

The evidence from case studies such as these suggests that CP emerges quickly in L2 children, which is demonstrated in part by the presence of embedded clauses in relatively early stages of development. This is in slight contrast with L1 acquisition during which embedded clauses take a relatively longer time to emerge. More importantly for the SLI-L2 comparison in this study, and as will be seen in Chapter 3, embedded clauses emerge even later in children with SLI and are often avoided once they do emerge.

2.3.4.3 Pearson (2002): Clausal embedding in narratives

Pearson (2002), drawing from the same population as Gathercole (2002, Section 2.3.3.5), studied the narratives of 160 bilingual Spanish-English children from Miami. The control group consisted of 40 native English-speaking second-graders and 40 native English-speaking fifth-graders (20 with high SES status and 20 with low SES at each grade level). The study design was cross-sectional, but the differences between the second and fifth graders were interpreted as representing changes over time within the same population (see Oller and Pearson 2002 for complete details of the entire study). The children were given the Frog Story task (Mayer 1969), in which they were asked to narrate a wordless picture book. The bilingual children completed the task in both Spanish and English. A narrative-based task was chosen because organizing sentence-level structures into discourse is a skill that typically develops during the early school years. The expectation is that typically-developing children will increase their use of syntactic structures such as embedded clauses (including relative clauses) as well as passives (Scott 1988); however, the question remained as to whether the bilinguals would progress in the same way or not and whether the narrative abilities in one language could predict the abilities in the other.

The narratives were recorded and transcribed. Language and narrative scores were computed; however, more attention will be given here to the language score. The language score was elaborated according to three sub-scores: complex syntax, lexicon, and morphosyntactic accuracy. For complex syntax, scores increased with the number of modal verbs or aspectual markers (or perfect tenses and the subjunctive in Spanish) and with the number of conjunctions which were something other than "and then." Morphosyntactic accuracy reflected the number of morphosyntactic errors or "elements that might draw sanction or correction from a monolingual adult" (p 146). Language scores also increased with greater use of complex temporal and clausal relations and greater lexical specificity. In addition, the following measures were calculated: MLU in words (number of words per T-unit, as in Hunt 1977) and a subordination index (mean number of clauses per T-unit), but these were analyzed separately from the language score mentioned previously.

When comparing the monolinguals and the bilinguals, the language score results for English showed that, overall, the bilinguals had dramatically lower scores than the monolinguals in the second grade group, but their performance was similar by 5th grade. For the complex syntax sub-score, the bilinguals were well below monolinguals at the 2nd grade level, but caught up to the monolinguals by 5th grade. The lexicon score followed a similar pattern; however, both the 2nd and 5th grade bilingual children remained well behind their monolingual peers for morphosyntactic accuracy. In fact, the bilingual 5th graders scored as far below their monolingual peers as the 2nd graders. The monolinguals also improved with respect to morphosyntactic accuracy across the age groups, but the other two language scores did not increase significantly between 2nd and 5th grade.

The bilinguals' performance in both Spanish and English was also compared. In general, their performance in English was better than Spanish. The complex syntax sub-score was highly correlated in both languages, but this was not the case for the lexicon or morphosyntactic accuracy scores. This result supports the idea that lexical and morphosyntactic knowledge tends to be distributed between both systems. The complex syntax and lexicon scores improved significantly from 2nd to 5th grade, but morphosyntactic accuracy did not. In my opinion, these findings also reflect a dissociation between syntax and morphology in the bilingual learners in this study. Although the bilinguals were behind their monolingual peers for complex syntax in the second grade, the bilinguals caught up to the monolinguals by the 5th grade. This was not the case for morphosyntactic accuracy. The bilingual 5th graders had significantly weaker scores in morphosyntax than the monolinguals. Because the 2nd graders and 5th graders were tested cross-sectionally, it is possible that the bilinguals could have caught up to the monolinguals before the 5th grade. Moreover, the complex syntax score was also based on modal verbs and aspectual markers in addition to subordinate clauses. Looking at subordinate clauses only may have yielded a different result at grade 2.

2.3.4.4 Marinis (2007): Passives

The review of the L2 child literature so far reveals that a majority of what we know about this acquisition context is based on (semi)-spontaneous language data. The types of tasks used in the studies presented previously can be criticized for being influenced by meta-linguistic strategies or personality traits such as shyness. Furthermore, spontaneous language and off-line elicited production tasks do not allow us to understand how language is processed automatically in real time. An important question for the study of child L2 acquisition concerns the automatic processes involved while a L2 child is performing a language task. Do L2 children process language in real time in the same way as TD L1 children? By tapping into automatic unconscious processes involved in language use, so-called on-line methods help to gain insight on how language is processed by different types of learners. On-line experiments collect reaction times (RTs) or physiological data such as ocular movements or event-related brain potentials (ERPs) (see Clahsen 2008 for a review of on-line methods adapted for children).

Marinis (2007) investigated how L1 and L2 children process passives in English via an on-line experiment. 30 L1 English children (aged 6;9-8;9) and 28 L2 English children (aged 6;10-8;8) whose L1 was Turkish and who were living in the UK participated in the study. The L2 children spoke Turkish at home and began regular exposure to English upon entry into nursery school (at 3-4 years old).

Marinis used a self-paced listening task to collect reaction times and a picture verification task to collect off-line responses. For the self-paced listening task, children first saw a picture on a computer screen and then listened to a sentence which was divided into segments. The audio stimuli were segmented according to points of interest in the syntactic structure (21). The children were told to press a button as fast as possible in order to hear the rest of the sentence, which allowed for reaction times to be recorded. After having heard the whole sentence, the child was asked to respond to an off-line comprehension question concerning the correspondence between the sentence and the picture.

The test sentences involved reversible active (19a-b) and full passive structures (21c-d). The audio and video stimuli were set up so that one sentence from each pair matched the picture and the other did not. This resulted in four different experimental conditions (active match, active mismatch, passive match, and passive mismatch).

(19) a. I think / that / the zebra / was kissing / the camel / at the zoo / last Monday.
b. I think / that / the camel / was kissing / the zebra / at the zoo / last Monday.
c. I think / that / the camel / was kissed / by the zebra / at the zoo / last Monday.
d. I think / that / the zebra / was kissed / by the camel / at the zoo / last Monday.

The results of the off-line comprehension task revealed that the L2 children were significantly less accurate than the L1 children for passives. Both groups had similar performances for actives in the match condition, but the L2ers were again significantly less accurate than the L1 group in all mismatch conditions. Despite these differences in comprehension, the L1 and L2 children did not differ qualitatively in terms of patterns in the reaction time data. The L1 children were faster overall than the L2ers, which is expected, but group scores showed that both the L1 and L2 children had longer RTs for passives than for actives. At the critical segment that supplies the morphological cue for an active or passive interpretation, both groups had longer RTs in the mismatch compared to the match condition. The author concludes that both L1 and L2 children are sensitive to the morphological cues in the processing of passives and therefore, L2 children do not develop differently from L1 children in terms of morphosyntax.

2.3.4.5 Unsworth (2005): Scrambling in L2 Dutch

The previously mentioned studies on embedded clauses, complex syntax in narratives (i.e., modal verbs, aspectual markers, and the use of conjunctions other than *and then*), and passives have shown that L1 transfer effects are rare observed in these specific constructions and that L2 children do not show any major delays in their acquisition. An important question in L2 child research concerns the stages that L2 children pass through and whether these differ from TD L1 children. Unsworth (2005) was able to identify and describe developmental stages and the effect of L1 transfer on scrambling in L2 Dutch. Like Pearson (2002), Unsworth investigated a structure which is not fully mastered until relatively late in TD L1 acquisition. She compared the development of scrambling in Dutch by L1 and L2 children (L1 English). In Dutch, a non-scrambled order (as in 22a) has a non-specific reading; whereas, the scrambled order (22b) has a specific interpretation. Although scrambled objects are produced around 3-4 years old in TD L1 acquisition, targetlike interpretation of scrambled indefinite objects is not acquired until later, possibly as late as age 7 or 9 (see Unsworth 2005, 2007 and citations therein).

(20)	a.	De jongen heeft twee keer [een bal] gegooid the boy has two times a ball thrown	[non-specific]
		‘The boy threw a(ny) ball twice.’	
	b.	De jongen heeft [een bal] twee keer gegooid	[specific]
		the boy has a ball two times thrown	
		‘The boy threw a (certain) ball twice.’	(Unsworth 2007)

A similar scrambling phenomenon is not found in English, so L1 transfer cannot be expected to accelerate the acquisition of scrambling in the L2. However, the acquisition of scrambling is related to a pragmatic principle that is not specific to any particular language. Therefore chronological age effects may also have an effect on performance. In other words, any child that has acquired the necessary pragmatic principle in their L1 should not encounter any difficulties with scrambling in Dutch (see Unsworth 2005 for more details).

An elicited production task was used to evaluate the L2ers ability to produce scrambled structures in appropriate contexts. During the task, the participant was presented a picture book which depicted a short story. The participants were then asked to respond to a comment or question made by a puppet, which created a context for the use of scrambling. There were two scrambling conditions (definite NP and specific indefinite NP) and one non-scrambled condition (non-specific indefinite). For the truth-value judgment task, the participant was shown a series of four pictures. The experimenter then described the story to the participant. Afterwards, a puppet, who had not seen the pictures, commented on the story. The participant was then asked to say if the puppet was right or wrong.

The L2 learners were native English-speakers residing in the Netherlands. There were 25 L2 children aged 5;3-17;4 (mean age = 9;3; *SD* = 2;4; AoO = 4;0 - 7;1; mean AoO = 5;6; *SD* = 1;0; LoE = 2;0-13;0; mean LoE = 3;8, *SD* = 2;6).[21] The L2 learners were compared to a group of 13 TD L1 Dutch children aged 5;6 - 5;11 (*M* = 5;8).[22] The proficiency levels of the L2 children were evaluated in Dutch using spontaneous language measures including verbal density (verbs/T-unit), lexical diversity, and ratio of error-free utterances. The proficiency measure allowed for the creation of subgroups which in turn allowed within-group comparisons to be made. Using proficiency as an independent variable provides an opportunity for analysis of developmental sequences as language ability in the L2 progresses. If progression towards the target grammar can be observed between the lower, intermediate, and higher proficiency levels, then developmental trends can be inferred, it is argued, without following the same individuals longitudinally. The child L2ers were distributed by proficiency levels as follows: 1) Low, n = 10; 2) Mid, n = 6; 3) High, n = 7.

The results revealed that L2 children go through an initial sequence that is different from L1 children and is influenced by L1 transfer. The L2 children with low proficiency produced a *negation – verb-object* order that was not observed in the L1 population and mimics English word order. Although comprehension[23] is generally expected to be easier than production, the comprehension scores were significantly lower than production in both groups. It was hypothesized that this disparity was due to the fact that discourse integration, which is

[21] The label "child" or "adult" was given according to the AoO of the individual. For example, anyone with an AoO of 7 or younger was labeled a child learner, even if they were old enough to be considered an adolescent or adult at the time of testing.
[22] A control group of 11 adults aged 18-24 (*M* = 20;6) was also used.
[23] The population for the comprehension task was larger than the population for production, but the general characteristics for the L2 groups were the same. For comprehension, there were 36 L2 children whose age at first exposure ranged from 4;0 to 7;3 (*M* = 5;7; *S.* = 1;0), age at time of testing from 7;3 to 14;11 (*M* = 10;4; *SD* = 2;3) and length of exposure from 0;7 to 10;5 (mean = 4;9; *SD* = 2;11). There were 14 children in the low proficiency group, 6 in the Mid, and 16 in the high level. The control population consisted of 99 monolingual L1 Dutch children aged between seven and 13 years old.

required to correctly interpret scrambling, is limited in younger children. Therefore, only the older children (L1 and L2) were able to respond in a targetlike manner, more or less regardless of proficiency. Unlike the production data, L1 transfer was not the crucial factor in the comprehension task, rather age at time of testing seemed to override effects of L1 transfer and proficiency.

Summarizing, taken together the studies presented in Section 2.3 suggest that there is evidence for underlying knowledge of functional categories (IP, CP, DP), but that morphological forms are not consistently targetlike. Interestingly, it appears that structures entailing syntactic operations such as embedding appear relatively early in longitudinal data collection, long before inflectional morphology becomes targetlike. This supports the hypothesis that there is a dissociation between syntax and morphology in L2 development (Lardiere 1998; 2000; Schwartz 2004; Prévost & White 2000).

Although L1 transfer has been shown to influence L2 child development (Unsworth 2005; Haznedar 1997), the properties discussed here were not consistently or obviously influenced by L1 transfer. For example, the children, Kenny and Greg (L1 English/L2 French) who were studied by Prévost & White (2000), Grondin & White (1996) and White (1996), rarely made any placement errors with object clitics in French. Findings for gender indicate that even L2 children with L1s that have grammatical gender distinctions do not acquire the L2 gender system easily (see Granfeldt et al. 2007 for L1 Swedish, L2 French and Meisel 2009 for L1 German, L2 French child learners).

However, as argued by Haznedar (2003), the fact that L2 children begin to use structures such as subordinate clauses relatively early in acquisition suggests that the L2 learner, who presumably has a fully-acquired L1, has access to the full inventory of syntactic operations that are present in the L1. This supports the predictions of the Full Access Full Transfer Hypothesis (Schwartz & Sprouse 1996). Unsworth's (2005, 2007) work on scrambling also shows that L1 transfer impacts L2 development in early stages in both L2 adults and children. Apart from providing the structure of early subordinate clauses and from impacting the development of scrambling in Dutch, the review presented here reveals limited influence for the role of L1 transfer. This question will be revisited in Chapter 4 (Section 4.4.2) when the effects of complexity and transfer are compared.

If the Full Access Full Transfer Hypothesis is correct and L2 children have access to the same syntactic operations that are present in their L1, then this is a relevant point of departure when comparing children with SLI to L2 children. As will be seen in Chapter 3, children with SLI are slow to acquire language in general and avoid computationally complex structures, including subordinate clauses and structures implying wh-movement. It could be that L2 children, with the assistance of their typically-developed L1 grammar, would have an advantage over children with SLI for certain syntactic structures. This is one question that the current study seeks to answer.

Factors such as AoO, LoE, and input quality are assumed to have an impact on L2 acquisition; however, it is not clear how exactly these factors influence development. Clearly, these variables do not influence monolingual children with SLI, but must be taken into account for the L2 group in a direct L2-SLI comparison. The next section explores the effect that these factors have on L2 child development.

2.4 Factors in L2 Acquisition

Because of the heterogeneous performance patterns observed in child L2ers, there are an increasing number of studies that have been carried out in an effort to understand how various factors contribute to the development of L2 child grammars (e.g., L1 transfer, age of onset, chronological age, length of exposure and quantity and quality of input, to name a few). In this section, previous work reporting on the effects of these factors on L2 children will be presented. This section is organized according to the morphosyntactic properties and syntactic structures presented in the first part of this chapter. Some of the previously discussed studies will be referred to again in this section in an attempt to group together what is known about the impact of these factors on overall success in L2 development.

2.4.1 Age of Onset

As mentioned in the introduction to this chapter, the question of the effect of age at which an individual is first exposed to the L2 has framed much of the debate on the nature of L2 acquisition within the generative framework. Evidence for the so-called critical period effects often come from studies that have centered on the ultimate attainment question, i.e., whether the end-state L2 grammar resembles that of a native-speaker or not (e.g. Johnson & Newport 1989, among others). The traditional research design for such studies involves adult participants who differ in age of onset (childhood onset versus post-puberty onset for example). Native-like linguistic performance in the L2 has been observed more often in the groups with early age of onset, which has lead researchers to conclude that L2 learners are more successful in their L2 if they begin exposure at an early age. However, results from ultimate attainment studies have not allowed researchers to agree on an exact age (or age range) which represents a cut-off for the end (or the beginning of the decline) of the period in which an L2 can be acquired successfully. Moreover, ultimate attainment studies do little to help us understand the developmental sequences that L2 children pass through during the course of development and whether they are different or similar to L1 children or L2 adults.

Recently, however, more attention has been paid to potential critical period effects on the developmental sequences of children learning an L2. With these types of studies, the research questions involve whether there are differences in the paths that L2 and L1 children take in language development or not. For example, are the error types observed in L2 similar to those observed in L1 or not? Are certain structures acquired in the same way in both populations? The same questions also apply to the comparisons between L2 children and L2 adults. If L2 children are exposed to the L2 while they are still in the critical period for language acquisition, then differences should be observed between them and L2 adult learners if the critical period hypothesis is correct.

Judging from the results mentioned in Section 2.3, there appears to be mixed results as far as age of onset is concerned. This section explores more carefully the effect of AoO on language performance in L2 children.

2.4.1.1 Age of onset and verb morphology

Recall from Section 2.3.1.2 that, concerning verb morphology in L2 child French, Kenny and Greg (AoO of 4;9 and 4;5 respectively) passed through a root infinitive stage that had characteristics which were similar to what has been observed for RIs in the TD L1 acquisition of French. These L2 children therefore appear to acquire finiteness in a way that is similar to L1 children. Elisa (AoO = 2;8) and Lorenzo (AoO = 2;4) (Belletti & Hamann 2004) produced very few root infinitives, which led the authors to conclude that neither of these children went through a RI stage, or that if they had, it was finished before the recordings began. Belletti & Hamann then assume that Elisa and Lorenzo had both matured beyond the stage where RIs are assumed to occur. Kenny and Greg were in the very initial stages of acquisition when they were first recorded; whereas Lorenzo and Elisa had had over a year of exposure at the first recording. Therefore, they may have already gone through a root infinitive stage that happened to be shorter than the RI stage observed in Kenny and Greg’s development (18 months). Granfeldt et al. (2007) and Meisel (2008) claim that their child L2ers (successive bilinguals with AoO that ranges from 2;11-6;7) pattern more closely with adult L2 learners on the basis of their use of subject clitics with root infinitives,[24] a pattern which is not attested in the (2)L1 literature. Meisel (2009) proposes therefore to consider that neurological changes occur between the ages of 3 and 4 after which acquiring a second language is more akin to adult L2 acquisition than (2)L1 acquisition.

Recall again from Section 2.3.1.2 that the difference between the results from Kenny and Greg (Prévost & White 2000, Grondin & White 1996), on one hand, and Granfeldt et al. (2007) and Meisel's (2009) L2 children, on the other, appears to be a matter of different interpretations given to the frequency of certain forms in the data. Whereas Kenny & Greg do produce subject clitics with non-finite forms,[25] the authors interpret this as a marginal phenomenon, given that this is not the case for a vast majority of non-finite verbs. However, for Meisel, the mere presence of subject clitics and non-finite verbs is enough to qualify the interlanguage grammar in question as being fundamentally different from L1 development. The results from Granfeldt et al. (2007) appear to show that subject clitics and non-finite verbs are relatively more frequent in their child L2ers than the other studies cited here. However, the rates that they reported included all types of subjects (including DPs and subject clitics) whereas Meisel (2009) and Prévost & White (2000) and Grondin & White (1996) analyzed other subject types separately. Meisel and Granfeldt therefore claim that the L2 children pattern with L2 adults; however, the L2 children's production of subject clitics with non-finite forms appears to be much lower than what has been reported for adults. For example, the adults L2 learners from Prévost & White (2000) performed as follows concerning the production of subject clitics with non-finite verbs: 1) Abdelmalek: 62% (168/272); 2) Zahra: 51% (120/236).

---

[24] Recall from section 2.3.1.2.4 that, for Meisel’s population, 4 out of 7 child L2ers produced subject clitics with RIs; however, these did not appear often (less than 5 occurrences per child, estimated from Meisel 2008; Figure 2 p63). For Granfeldt et al. (2007), 4 of the child L2ers with lower proficiency produced the following percentages of root infinitives with subjects: 14% (3/22), 25% (5/20), 28% (13/47), and 19% (8/42), respectively. One child L2er with lower proficiency produced no root infinitives and the two child L2ers with higher proficiency produced root infinitives with subjects at rates of 2% (1/52) and 7% (2/30), respectively (see section 2.3.1.2.3)

[25] Only 3.9% of Kenny’s nonfinite verbs occurred with subject clitics (3/76); whereas 37.1% (159/428) of his finite verbs were produced with clitics. Greg produced subject clitics with nonfinite verbs a bit more often at 22.4% (13/58), but this rate was nevertheless lower than clitics with finite verbs (69.5%, 411/591).

The school-aged children Paradis et al.'s (1998) (AoO = approximately 4-5 years) patterned with the L1 controls on finiteness and associated properties. Again, there may be a question of how to interpret the appearance of certain phenomena at very low rates, but these authors concluded that the very high rate of finite verbs with subject clitics pointed to the acquisition of agreement in these L2ers.[26] Of course, these children were studied after 2 years exposure, so the initial stages of acquisition had very likely passed. However, despite a relatively young age of onset, some of these children did not use the past or future tense as often as the controls and third person plural present forms were not always appropriately marked. These results indicate that, despite their relatively young age of onset, some of these L2 learners differed from the monolinguals even after 5 years exposure.

Taken together, these studies show that L2 children go through a stage in which non-finite forms are produced in root declaratives, but it is not clear whether these RI stages share similar properties across L1 and L2 learner groups. The different conclusions may be a question of the weight given to quantitative versus qualitative patterns in the data. The different patterns in the data may also be the result of differences in the children studied, such as the chronological age and length of exposure, as well as differences in experimental setting (e.g., how spontaneous language was obtained: play session versus interview).

Recall from Section 2.3.1.3.2 that, concerning the results for L2 English, Jia & Fuse (2007) set out to test the effects of age of onset on grammatical morphemes in English. Initial results of the five-year longitudinal study revealed positive correlations (although not statistically significant) between the correct suppliance of inflectional morphemes and age of onset, which indicates an advantage for older learners. Then, between the first and second year of exposure to English, the correlations became negative, but not significant. Only at the end of the study did these negative correlations, which indicate an advantage for younger learners, become statistically significant for the 3rd person singular and close to significance for past tense *–ed*. The three children who mastered the third person singular were all younger than 9 at onset. The age of onset of the four children who acquired the irregular past tense was 6, 8, 9 and 16, respectively. However, it was discovered that age of onset and environmental factors were confounding variables (see Section 2.4.3.1 below for more details). Because morphemes such as third person singular *–s* and the past tense were mastered by only a few children after five

[26] Recall that from section 2.3.1.2.5, for year one, the L2ers used clitics with finite verbs 96% of the time on average (range: 89%-100%). At year 2, the mean rate was 98% (95-100%) and 98% (98-100%) at year three.

years, it appears that longitudinal studies must exceed 5 years in order to measure the entire developmental path. Considering these confounding factors and lack of clear differences between the younger and older learners, the authors conclude that children with younger AoO are not fundamentally different from children with older AoO, as the critical period hypothesis would predict. In my opinion, it could also be that an AoO of 5 is not young enough to observe critical period effects for morphosyntax (Meisel 2009).

2.4.1.2 Age of onset and object clitics

Recall from Section 2.3.2.2 that Elisa (CA = 4;0; AoO = 2;8; LoE = 1;1) and Lorenzo (aged 3;5; AoO = 2;4; LoE = 1;2), the two children studied in Belletti & Hamann (2004), differed with respect to the production of object clitics. Whereas Elisa (AoO = 2;8) produced object clitics in post-verbal position, an error which is never observed in L1 acquisition of French, Lorenzo (AoO = 2;4) patterned very closely with L1 children. Belletti & Hamann attribute this difference to several possible factors, including the fact that Lorenzo's AoO was earlier than Elisa's. However, Elisa was also 7 months older than Lorenzo at the beginning of the recordings and Lorenzo may have had more L2 input outside of the daycare where they were exposed to French. The authors do not suggest that one of these factors was more important than the others.

Recall from Section 2.3.2.4 that Chondrogianni (2008) compared the L2 children in her study to L2 adult learners in order to better understand AoO effects in their development of object clitics in L2 Greek (L1 Turkish). The child and adult groups were matched in proficiency. In the elicited production task, the L2 children and adults in the 'low' and 'lower' proficiency groups produced a similar rate of object clitics, DP objects instead of clitics, and null objects. However, the L2 children with 'upper' and 'high' proficiency produced significantly more object clitics, fewer DP objects, and fewer null objects than the L2 adults of equivalent proficiency. However, in the story-telling task, there were no differences between the L2 children and adults (the children produced a higher number of clitics, but this did not reach significance due to high variability). Both the adult and child groups exhibited a delay in the acquisition of object clitics. A certain number of both children and adults had relatively long exposure to the L2, but nevertheless scored low on the proficiency evaluation and appeared to have reached a period of stabilization with respect to object clitic production. The L2 adults, in particular, appeared to be more strongly affected by the discourse constraints of object clitic production in the elicitation task compared to the arguably more discursively natural story-telling task. The results led the author to conclude that, generally-speaking, the L2 children and adults acquired object clitics in similar ways, but that differences involving age and input could affect both groups with respect to structures, such as object clitics in Greek, which involving the integration of several linguistic domains (syntax, morphology and pragmatics).

2.4.1.3 Age of onset and gender

Concerning the age of onset effect in studies which have examined the acquisition of gender, different results have been found according to the type of task used by the investigators and the characteristics of the L2 population being tested.

First of all, prior ultimate attainment studies have found age of onset effects in the acquisition of the grammatical gender system in French. For example, Guillelmon & Grosjean (2001) tested a group of L1 controls, simultaneous bilinguals and child L2ers as adults. Early bilinguals showed inhibitory effects in conditions where there was a gender mismatch, whereas later bilinguals were not sensitive to violations in gender marking. However, see Montrul (2008a) for a different set of patterns found with heritage speakers.

The qualitative error analysis of gender marking by 2L1 (N = 4; AoO = 3;0 - 3;6) and child L2 learners (3;7 - 3;8) led Meisel (2009) to conclude that the child L2 group (N = 6) made errors which were indicative of lexical learning instead of assigning nouns to classes. He also noted that the children with younger AoO made gender errors as well, but the only two children to have potentially mastered gender assignment were 2L1 children. Meisel interprets these findings as further evidence that 2L1 and L2 children rely on fundamentally different developmental processes and that the border between the different acquisition types occurs around the ages of 3-4. Granfeldt et al. (2007) also found that their L2 children made more errors than the 2L1 children, but errors were found in both groups. The results of these two studies, whose conclusions were based on either quantitative or qualitative differences among a small number of children, suggest that there are observable differences between simultaneous and early successive bilinguals. These differences are attributed to differences in AoO by the authors.

However, Hulk (2007) did not observe any AoO effects in her study on the acquisition of gender in French and Dutch by a group of children from French-speaking families who had been exposed to Dutch between birth and 4 years old. Although these children made only one error (out of 275 contexts) in French, their correct production of the neuter gender in Dutch reached only 30% on average. These results were compared to a longitudinal study of the spontaneous language of two simultaneous French-Dutch bilinguals. These two children's development of gender in Dutch was similar to monolinguals, but one of the bilinguals had a high number of gender errors in French.

The difficulty in acquiring the neuter gender in L2 Dutch was also highlighted by Unsworth (2008), who showed that both L2 children and adults (L1 English) continue to make gender errors after long exposure to the L2, regardless of AoO. Although some of the L2 children in the study were exposed to Dutch from birth, they did not all attain target performance with respect to the Dutch gender distinction. Interestingly, a handful of L2 adults were able to mark gender successfully after a lengthy exposure to the Dutch.

Gathercole (2002) also revealed that bilinguals do not always perform in a targetlike manner concerning grammatical gender. Her study on school-aged bilingual children (Spanish-English) in Miami revealed that both simultaneous and successive lagged behind monolinguals with respect to the recognition of ungrammatical sentences with a gender error.

The results from these studies show that although there is some evidence that simultaneous bilinguals and early successive bilinguals produce gender agreement in a more targetlike manner, other studies have shown that AoO has no obvious impact on gender agreement in L2 acquisition (e.g. Unsworth 2008). The results on the school-aged simultaneous and successive bilinguals (Gathercole 2002) suggest that children whose onset is young are not guaranteed to perform like monolinguals of the same age. An important aspect of acquisition of grammatical gender is the contribution of quantity and quality of input, which will be discussed in Section 2.4.3.2.

2.4.1.4 Age of onset and syntactic structures

The case studies reviewed in the earlier section on the emergence of CP in L2 children do not directly compare younger to older learners and thus they do not address the factor of age of onset directly. However, in Lakshmanan and Selinker (1994)'s study, embedded clauses emerged early in both the 4-year-olds and the 10- and 12-year-olds.

Recall from Section 2.3.4.3, in her study on narratives by successive and simultaneous bilinguals (Spanish-English), Pearson (2002) revealed that children who were exposed to

Spanish at home and did not receive systematic exposure to English before entering the Miami school system (the OSH group) used complex syntax as often as the bilinguals who were exposed to both languages at home from birth (ESH group). Therefore, there appears to be no significant age of onset effect on the frequency of complex syntax in this particular population.

Unsworth (2005, see Section 2.3.4.5) argued that the acquisition of scrambling in L2 Dutch by L1 English speakers represented a poverty of the stimulus problem. The interpretive constraints of scrambling were unlikely to be understood from the input, this construction was not taught in language classrooms, and it could not be transferred from the L1. Therefore, if L2 learners can acquire the interpretive constraints involved in scrambling, this constitutes evidence for access to UG. Unsworth compared the performance of three learner groups: L1 children, L2 children and L2 adults on elicited production and comprehension tasks. The L2 children[27] in this study were matched with the L2 adults according to proficiency in the L2. The proficiency measure allowed the child and adult groups to be more comparable according to a variable that both groups have in common and to reduce the advantages that adults may have due to age differences and cognitive maturity. For the production task, there were 23 adults aged 10-50 years (mean age = 23;10, *SD* = 11;0; AoO = 8;0-32;0, mean AoO = 19;3, *SD* = 8;8; LoE = 0;3-27;0, mean LoE = 4;4, *SD* = 6;0).[28] The adult L2ers were distributed by proficiency levels as follows: 1) Low, n = 7; 2) Mid, n = 6; 3) High, n = 7.

Her results showed that L2 children and L2 adults pass through the same developmental sequences. These stages are very similar to those of the L1 children (aged 5;6-5;11), with the exception of the initial stage, which is most likely influenced by L1 transfer. Both the L2 adults and children in the high proficiency group (and some in the mid-level group) distinguished between the scrambled and non-scrambled conditions in the production task and they did not perform differently than the L1 controls. Furthermore, both L2 children (11/36) and L2 adults (11/37) displayed knowledge about the interpretive constraints on scrambling in comprehension. Therefore, English-speaking children and adults, who differ based on their

[27] Recall that, concerning the characteristics of the child L2 group for the production task, there were 25 L2 children aged 5;3-17;4 (mean age = 9;3; SD = 2;4; AoO =4;0 - 7;1; mean AoO= 5;6; SD = 1;0; LoE = 2;0-13;0; mean LoE = 3;8, SD = 2;6).

[28] The adult L2 group who completed the comprehension task was also different. There were 37 adults with the following characteristics: AoO ranged from 8;0 to 43;0 (mean = 19;7; SD = 10;1); Age at time of testing ranged from 9;8 to 50 (mean = 24;0; SD = 13;4); LoE ranged from 0;2 to 25;0 (mean = 4;4; SD = 5;3). Concerning proficiency, there were 18 adults in the low proficiency group, 8 in the Mid, and 11 in the high level. The adult control group consisted of 13 L1 Dutch adults.

age of first exposure to Dutch, are capable of acquiring scrambling in Dutch, thus overcoming the poverty of the stimulus issue. The similarities between these three groups provide evidence against the idea that these two groups of L2 learners acquire language in a fundamentally different way.

2.4.2 LoE

An important question that has not often been addressed in L2 child research concerns how long it takes L2 children to master a particular construction in the L2. The term length of exposure (LoE) refers to the amount of time that a child has been exposed to the L2, as is typically calculated by the following equation:

Chronological Age at time of testing – Age of onset = LoE

The term input quantity will be used to express how much time per day the child is in contact with one of the two languages. Quality (or type) of input will be used to refer to the type of speakers the child interacts with in the L2 (e.g., native-speaking adults). The term "language environment" will refer to the general characteristics of the context in which the L2 child is acquiring the L2, including concepts such as quantity and quality of input. Findings about input quantity will be addressed in Section 2.4.3.

Compared to age of onset, fewer studies have directly tackled the question about how long it takes for children to reach targetlike performance in their L2. Hakuta et al. (2000) reviewed standardized assessment scores of school-aged L2 children learning English from two different school districts from the San Francisco Bay Area and compared these results to reports on two other school districts in English-speaking Canada. The overall conclusion from these reports was that it took L2 children between 3-5 years to develop oral proficiency in English. Saunders and O'Brien (2006, cited by Paradis et al. 2011) reported a similar trend based on a review of the literature on oral language outcomes in L2 child English learners. This section presents studies which have reported on effects of length of exposure on the development of verb morphology, object clitics, and grammatical gender by L2 children.

2.4.2.1 LoE and verb morphology

The case studies reviewed in the earlier section on verb morphology all study L2 children in initial stages and do not address the factor of length of exposure directly. One can remark very simply, however, that development was observed over time in these children.

Meisel (2008) also looked into the effect of length of exposure on 2L1 and child L2 learners of French in Germany. A second group of children with varying lengths of exposure was drawn from the larger population from the longitudinal study at the University of Hamburg (see Section 2.3.1.2.4). This group was comprised of 12 child L2ers whose exposure to French began between 2;11 and 3;07. Two of these children were aged 3;04 and 4;00, had begun their exposure to French at 2;11 and 3;07 respectively, and had been exposed to the L2 for 5 months each. Five other children (aged 4;05-4;10) had begun their exposure to French at between 3;01-3;06, and had been exposed to French for 1;04 months each. Finally, a third group of five children (aged 5;08-5;11) began exposure to French at between 3;04-3;07, and had 2;03-2;05 years of exposure. These 12 children therefore differed in terms of chronological age (age at time of testing) and in terms of length of exposure. It should be noted that the older children also have the longest exposure.

The use of finiteness and related properties (finite and non-finite verb forms and the target analysis of clitics as weak pronouns or agreement markers) in spontaneous language was also examined in this second group. The two children with the least exposure used primarily formulaic expressions, which led to the conclusion that these two child L2ers do not use finiteness productively at this stage. The other 10 children with longer exposure used finite verbs productively. However, they also produced subject clitics with non-finite verbs, which, according to Meisel, constitutes a major difference between child L2 and (2)L1 acquisition. Six out of the ten L2 children produced such forms, but the occurrences were small in number (3 or fewer per child).[29] Recall from Section 2.3.1.2.4 that, although this type of error was rarely found in the data, the author argues that it represents a qualitative difference between different types of acquisition. Three of these children (two with 1;04 exposure and one with 2;04) exhibit patterns with subject clitics that indicate a misanalysis of the nature of these elements (absence of clitic doubling, use of strong pronouns as subjects). Because subject clitics must attach to a finite verb, the author concludes that these children have not yet successfully acquired finiteness in French, even after 1-2 years of exposure.

Jia & Fuse (2007) chose L2 children with the same LoE (3 months) at the onset of their longitudinal study on the development of inflectional morphemes in child and adolescent English L2 learners (L1 Mandarin). A major finding from this study is that none of the 10

[29] Meisel (2008) argues that if we consider the number the contexts in which non-finite thematic verbs were preceded by subject clitics, the percentages are larger: 1/3; 2/2; 1/7; 2/8; 3/27; 1/2).

children, even those who with relatively young AoO, had mastered the regular past tense marker *–ed* after five years of exposure. Furthermore, a growth curve analysis of this particular morpheme indicated no significant growth over time. The authors note that visual analysis of the graph suggested that the children with younger AoO were at the beginning of a growth curve that would take many more years to complete; whereas, the older children showed no progression at all. These results indicate that it takes both young and old child L2 learners longer than 3-5 years to master certain morphosyntactic properties in their L2. This suggests that the estimation of 3-5 years for morphosyntactic proficiency in L2 English (e.g., Hakuta et al. 2000) is perhaps too short for those morphosyntactic properties that pose major difficulties for L2 child learners. [30]

2.4.2.2 LoE and object clitics

Haiden's (2011) study on the elicited production of object clitics by L2 French child learners (L1 English) revealed significant positive correlations between the production of the accusative clitic (both 1st and 3rd person) and LoE. The rate of substitution of DPs in the context of third person accusative clitics was not correlated with LoE, but is negatively correlated with the standardized assessment scores of the L1 of the L2 children. Haiden therefore concludes that the substitution of DPs in the context of a 3rd person accusative clitic could be taken as a sign of language impairment. The idea is that avoiding accusative clitics through the use of DPs is not highly associated with the amount of exposure to the L2, but rather with overall proficiency in the L1. Finding markers that are not closely linked to LoE, but are linked to overall language performance in the L1 is key to being able to assess L2 learners with little exposure. If it is known that a certain morphosyntactic property does not require long exposure to the L2, then difficulties with this property could not be attributed to a lack of time required for acquisition. This type of knowledge would potentially allow L2 children with language impairment to be diagnosed quickly and accurately. Evidently, more work is needed to better understand how a pattern such as the use of DPs instead of accusative clitics by L2 child learners of French might signal language impairment.

Having observed that LoE is not always a reliable measure of ability in the L2, Chondrogianni (2008) relied on a proficiency measure to make different subgroups in her L2 population. L2 children with higher proficiency did in fact perform closer to MLU-matched L1 children in

[30] A LoE of about 5 years also appears to be an amount of time that is often referred to in the literature as being enough time for an L2 learner to reach the end-state grammar (e.g., Johnson & Newport 1989).

terms of clitic suppliance compared to L2 children of lower proficiency. Interestingly, the author noted that some children with relatively long exposure (5 years) were placed in the lower proficiency groups.

2.4.2.3 LoE and gender

The results on the acquisition of grammatical gender by adult and child L2 learners of Dutch highlight the importance of LoE to the mastery of the neuter versus common gender distinction. Studies on different bilingual populations in the Netherlands (Hulk 2007; Hulk and Cornips 2006) revealed that the acquisition of the neuter-marked definite determiner *het* is delayed and these learners appear stuck in a stage in which they overgeneralize the common definite determiner '*de'* with neuter nouns. Although a delay in the master of *het* is observed in L1 children, development in the use of *het* can be observed until at least 6 years old, when it is often acquired. L2 children, however, continue to overgeneralize '*de'*, in the absence of an observable developmental trend (Hulk and Cornips 2006).

Unsworth (2008) also studied the L2 acquisition of Dutch gender in English-speaking children and adults. Some of the children had been acquiring both Dutch and English from birth, but no age effects were observed in the results. Both adults and children generally failed to produce *het* with neuter nouns and instead overgeneralized the common determiner, *det*, as the other L2 learners and L1 children have been shown to do. The conclusion from this study was that the length of exposure to Dutch appeared to be the deciding factor in the targetlike acquisition of the neuter – common gender distinction. LoE correlated significantly with the rate of *het* used with neuter nouns and those participants with target-like performance all had relatively long exposure to Dutch. However, some learners with lengthy LoE (8;5-27;0) did not have target-like performance for gender. Unsworth concludes that a lengthy and extensive exposure[31] to Dutch is necessary, but not necessarily sufficient for targetlike performance with *het*.

2.4.2.4 LoE and syntactic structures

Overall, little research has been done on the effect of LoE on the production of syntactic structures such as embedded clauses, wh questions, or passives. The case studies reviewed in

[31] Based on the fact that L1 Dutch children acquire the neuter – common distinction around 6 years old and that most people assume that bilinguals divide their exposure time between their two languages, a bilingual would need at least twice the time (12 years) in order to master this distinction. The four participants in her study who had acquired this property had been exposed to Dutch for 5, 11, 13, and 25 years, respectively.

the earlier section on the emergence of CP in L2 children are based on development in relatively early stages and do not compare different children with different LoE. However, it is remarkable that structures implying CP appear to emerge relatively quickly in the children.

The Spanish-English bilinguals in Pearson's (2002) study caught up to the monolingual L1 English controls by the 5th grade in terms of the complex syntax used in their narratives in English. This result indicates that complex syntax can be age appropriate while the children are still in primary school. However, the bilingual 5th graders remained below their age-matched peers in terms of morphosyntactic accuracy (i.e., the frequency of grammatical errors) in their narratives. This pattern of age appropriate syntax, but delays in morphosyntax suggests that LoE does not affect all language domains in the same way. In this case, morphosyntax appears to be more sensitive to LoE than syntax. In order words, morphosyntax takes longer to become targetlike than syntactic structure.

Recall from Sections 2.3.2.4 and 2.3.4.5 that Chondrogianni (2008) and Unsworth (2005) used proficiency instead of LoE to create subgroups of L2 children with presumably varying abilities in the L2. The creation of subgroups based on proficiency allows for within group comparisons from which developmental sequences can be inferred. In Unsworth's study on scrambling in L2 Dutch, a correlation was found between LoE and proficiency, but not between LoE and scrambling in production. Proficiency[32] and not LoE, was the best predictor of scrambling in both L2 child and L2 adult groups in production. In comprehension, targetlike responses increased overall with proficiency; however, this effect was not significant due to a chronological age effect on performance in comprehension. Out of the 22 L2 learners who were able to display knowledge of scrambling, their LoE ranged from 0;4-16;0 years. This suggests that (some) L2 learners do not take as long as (some) L1 learners to acquire scrambling in Dutch (Unsworth 2005).

2.4.3 Quantity and Quality of Input

2.4.3.1 Quantity and quality of input and verb morphology

In their study on the longitudinal development of grammatical morphemes in ten L2 children learning English (L1 Mandarin), Jia & Fuse (2007) also collected home language environment

[32] Proficiency was measured using spontaneous language measures including verbal density (verbs/T-unit), lexical diversity, and ratio of error-free utterances (see section 2.3.4.5).Proficiency measures were used to determine the relative developmental stage of the L2 learner compared to the other learners in the study.

data via annual parental questionnaires and child and parent interviews. Parents were asked to provide information concerning television and reading habits in each language, the language spoken with friends, and the percentage of time that they spoke each language at home. Answers to these questions were translated into a composite score for each year of the study. Age of onset predicted a language environment with more L2 input and therefore less L1 input, which means there is a major confound in the study: those who were exposed to the L2 at a young age were more likely to have a more L2 than L1 input outside of school. The authors were able to tease apart the influence of environmental factors and AoO effects using statistical analyses and concluded that language input was a stronger predictor of performance variance than AoO.

Paradis (2010a) studied the impact that home language environment has on the performance of past tense in a group of 23 simultaneous and very early sequential French-English bilinguals. The children were aged 4;1-5;7 at testing (mean age = 4;10; *SD* = 0;5) and had been exposed to both languages from birth or from 1;6 at the latest. All children were from Edmonton, Canada and were attending a French language daycare, preschool or kindergarten. The children's parents were interviewed to determine how often each language was used with the child at home. Based on the home language data, the children were separated into two groups: the More-English group and the More-French group. The two groups did not differ in age. Performance on the past tense in English was measured using the past tense items from the TEGI (Test of Early Grammatical Impairment: Rice & Wexler 2001). An experimental task for French was designed with a similar format to the TEGI. For each of these tasks, the child was shown two pictures depicting an on-going action and then the completed action. The child was then asked what the character in the pictures had done. Three different scores were calculated for each language: regular past tense, irregular past tense, and past-finite. This third measure abstracted from the form of the past tense verb and indicated whether past tense was marked at all. In other words, if *digged* was produced instead of *dug*, then the child was given credit for having marked the past tense, even if the form was non-target. The bilingual children were compared to the norm referencing population from the TEGI for English and to a group of 21 French-speaking monolingual children aged 3;7-5;4 (mean age = 4;9; *SD* = 0;5) for French.

The overall result was that the monolingual children had better performance than the bilingual children. More specifically, concerning the French task, the monolingual French children were significantly more accurate than the bilinguals for irregular past tense, but their performance was similar for regular past tense. However, when the two input groups were compared to the monolinguals, the More-French group patterned with the monolinguals for all three measures, while the More-English children performed significantly lower on all three measures when compared to monolinguals and on the regular and irregular past tense measures when compared to the More-French group. Furthermore, the More-French group scored significantly higher than the More-English group for both tense types. A similar pattern emerges for the English scores. The norming sample from the TEGI scored significantly higher than the bilingual group on all three tense types. The More-English group did not differ significantly from the TEGI population for the past-finite or the regular past measures, but they did score significantly lower on irregular past when compared to the monolingual English-speaking children. The More-French group differed significantly from the TEGI population for all three measures. The More-English scored significantly higher than the More-French group for regular past, but had similarly low scores for the irregular past in English.

These results indicate that bilingual children are sensitive to input factors, measured in terms of the quantity of input they received in each language and in terms of the frequency of certain morphosyntactic forms in the language. In other words, bilinguals have lower performance in the language they are less frequently exposed to and also have lower performance for forms which are less frequently used in a given language (regular verbs are assumed to have a higher type frequency, even if some irregular past tense verbs are used frequently, see Paradis (2010a) for more details). However, when input quantity (here, in terms of the language spoken more often at home) is taken into account, the differences between monolinguals and bilinguals are diminished, indicating that bilinguals are not consistently behind monolinguals.

2.4.3.2 Quantity and quality of input and gender

After observing that Turkish L1 learners of Dutch have been shown to take a very long time in acquiring the grammatical gender system in Dutch, Hulk & Cornips (2006) hypothesized that this was due to the type of input to which they were exposed during their L2 development. These L2 learners, the authors argued, were exposed to a variety of "ethnic Dutch" in which neuter was marked very rarely. This input would therefore explain the extreme delay in the acquisition of gender by L2 learners in this particular context. However, Unsworth (2008) showed that the same pattern of overgeneralizing the common gender is found in English learners of L2 Dutch. Unlike the Turkish L1 speakers, the English L1 learners were primarily exposed to native speakers of Dutch and were from very different socio-economic backgrounds than the Turkish L1 learners. Unsworth's results therefore go against the idea that the variety of Dutch that the Turkish speakers are exposed to is an influential factor in the delay in the acquisition of the neuter/common gender distinction in Dutch.

In her study on Spanish-speaking children learning English in Miami, Gathercole (2002)'s results on the ability to recognize incorrect grammatical gender marking on determiners and adjectives revealed an advantage for monolingual Spanish-speakers over the bilinguals. Furthermore, bilinguals with more Spanish input at home (Spanish only at home) and at school (two-way schools) also had an advantage over Spanish-speakers who spoke both English and Spanish at home and attended Spanish immersion schools. The learners with more English in their input took the longest to master gender marking in Spanish.

2.4.3.3 Quantity and quality of input and syntactic structures

Pearson (2002) evaluated language scores (complex syntax, lexicon, morphosyntactic accuracy) based on the production of narratives in Spanish and English by Spanish-speaking children learning English in Miami.[33] She found no significant main effects of school type (two-way or immersion) on language scores in English. An advantage in vocabulary in English was associated with the home language environment (Spanish only versus both English and Spanish). Children who spoke English and Spanish at home had higher lexicon scores in English compared to those who spoke only Spanish at home, but these two groups had similar scores for morphosyntactic accuracy and complex syntax. Those children who spoke both languages at home did not increase in morphosyntactic accuracy from 2nd to 5th grade; whereas those who spoke only Spanish at home did. An SES effect on morphosyntactic accuracy was found in the group who spoke both languages at home.[34] Therefore, home language environment influenced lexical development, a domain that has been shown to be particularly sensitive to language input. Interestingly, attending a two-way school did not harm the children's progress in English.

---

[33] Recall that this study is cross-sectional. Groups of 2nd and 5th graders were compared to each other and differences in these groups were argued to be developmental.
[34] A similar effect was found in the monolingual group.

For the narratives in Spanish, the type of school had a greater effect on performance in Spanish than English. Greater input in Spanish at school (two-way method) contributed to the growth of lexicon and complex syntax scores in Spanish, but did not contribute to morphosyntactic accuracy; whereas, the home language environment showed no strong effects on the lexicon or complex syntax. However, regardless of school type, the children who spoke Spanish only at home had an advantage over the children who spoke both languages with respect to morphosyntactic accuracy. When examining over-all patterns, it appears that home language environment did not affect language domains in similar ways across languages.

When comparing the performance in one language to another, complex syntax was found to be highly correlated across Spanish and English; whereas morphosyntactic accuracy and lexicon scores were not. Based on these results, Pearson explains that the "degree of embedding in complex sentences" was similar in Spanish and English. Instances of equal performance in both languages suggest a capacity that was shared across both systems, and therefore should be less sensitive to input quantity.

2.4.4 Chronological Age (CA)

An examination of the review of L2 acquisition factors presented here reveals that variables such as age of onset, length of exposure, and quantity and quality of input have received or are starting to receive a fair amount of attention. One factor that arguably receives less attention is that of chronological age at time of testing (CA). As pointed out by Stevens (2006), CA, AoO, and LoE, are a trio in which values of two of the variables determine the third.[35] As such, these variables are all linearly related and it becomes impossible to estimate covariances, correlations, or slopes for the three independent variables and a dependent variable, such as L2 proficiency, for example. She goes on to say that if one variable is omitted, the correlations of the other two variables incorporate the omitted one. The general idea here is that all three of these variables must be taken into account when attempting to attribute acquisition patterns to any one of them. Some of the studies reviewed here appeared to have diversified their L2 populations in a way that prevents this trio of variables from being strongly correlated across participants; however, this is not always made explicit and can only be estimated from the available population data.

[35] As stated previously, the typical calculation for these variables is:

Age at time of testing – Age of onset = LOE

Few of the studies cited in this chapter have directed addressed the effect of chronological age. One exception is Unsworth (2005) in her study on scrambling in L2 Dutch, who notes that out of 15 of the younger L2 children (7-8 years), four have higher proficiency than some of the children in the oldest group (13-14 years). However, despite this difference in proficiency, the older children provided more targetlike responses than the younger children. Unsworth acknowledges a confound between age and proficiency (i.e., the older children vary less in proficiency). However, she tentatively concludes that chronological age, which is linked to increasing capacity in discourse integration, had a greater impact than proficiency on L2 performance in one of the tasks testing the comprehension of scrambling. In my opinion, examples such as these reveal that attention should be paid to chronological age in studies whose goals are more focused on the effects of AoO or LoE.

2.5 Conclusion

The goal of this chapter was to present findings that can contribute to the overall characterization of how typical L2 child acquisition proceeds. Knowing how to distinguish an L2 child with SLI from a TD L2 child depends in part on understanding the various healthy developmental paths that a TD L2 child could potentially follow. Given the heterogeneity observed in typical L2 children, more research is needed to understand what these possible paths might be and how various internal and external factors may impact the path a TD L2 child takes.

The picture that emerges from the literature suggests that AoO plays a role that is less crucial than is sometimes assumed. Recent studies comparing L2 adults and L2 children have not found fundamental differences in their developmental sequences (Unsworth 2005; Chondrogianni 2008). Furthermore, studies that have compared L2 children with varying AoO have not consistently found advantages for L2 children who were younger at first exposure to the L2.

Another trend that emerges from this review concerns the dissociation between morphology and syntax in L2 child acquisition. Although empirical evidence may not always support it (e.g., Blom 2008), Schwartz's DAM model appears relevant to some of the patterns observed in L2 children, namely, in my opinion, the "adultlikeness" of syntactic structure in the performance of L2 children. The early emergence of embedded clauses, the stronger performance in complex syntax versus morphosyntactic accuracy in narratives, and the targetlike processing of passives suggests that the computations involved in these structures are operative in the L2 from initial stages and, crucially, do not pose particular problems as L2 development continues. This observation is pertinent to the comparison with SLI because impaired children have been shown to have difficulties with such computationally complex structures (see Chapter 3). If L2 children are like L2 adults with respect to syntax, then this suggests that L2 children should be better equipped to process complex syntactic structures compared to the SLI, who are slow to develop these structures.

Furthermore, if certain syntactic computations are immediately available in the L2, then they should be less likely to be influenced by factors such as input quantity and quality. Although Pearson's (2002) results paint a multifaceted and complicated picture of how input can interact with language measures in both languages, one trend that emerged was that their measures of complex syntax appeared less affected by the home language environment (and sometimes by the type of schooling) than morphosyntactic accuracy and lexicon. Seeing as morphosyntactic properties can take a certain amount of time to acquire and have been shown to be influenced by input factors, using them to track down differences between children with SLI and TD L2 children presents major challenges.

As is evident from the current review, the L2 child development of syntactic structures such as embedded clauses and wh-questions has not been given much attention. These types of structures have often been analyzed as being computationally complex and have been shown to cause problems in atypical language acquisition. However, little is known about how L2 children deal with such structures in their L2 or about the impact that computation complexity has on child L2 learners. This thesis therefore seeks to fill this gap in the literature by examining the frequency of clausal embedding in spontaneous language in L2 children.

Moreover, theoretical accounts of L2 acquisition have attempted to explain the difficulty that L2 learners have in realizing morphological forms. Patterns of difficulty with morphology, but an intact underlying syntax is the idea behind the Missing Surface Inflection Hypothesis. The MSIH considers that syntactic representations are not impaired, but morphological forms may be harder to access if processing demands are too high. Following this logic, as processing cost increases, so should errors in morphology in (healthy) L2 learners. The present study also seeks to test this prediction in examining the effect that the production of clausal embedding, which arguably entails a higher process load, has on the frequency of non-targetlike morphosyntactic forms in spontaneous language.

The following chapter discusses the literature on SLI with a special focus on clinical markers and the role of complexity in children with SLI. The review on clinical markers will reveal that L2 children and SLI have difficulty with the same morphosyntactic properties. However, the role of computational complexity has been more thoroughly studied in children with SLI compared to L2 children. The interest in comparing the literature on L2 children to the literature on SLI is to try to identify the linguistic properties that appear to pose fewer difficulties for L2 children compared to children with SLI, which could potentially help distinguish between children with SLI and L2 children.

3 Computational Complexity and the SLI Perspective

3.1 Introduction

In the previous chapter an overview of trends in child L2 acquisition was presented, which led us to the preliminary conclusion that the factor of computational complexity has rarely been investigated in this learner context. We will see in this chapter that the investigation of the role of complexity in typical and atypical language development has yielded interesting results in work on children with SLI. One of the objectives of this thesis is therefore to understand how computational complexity impacts the L2 context in the hope that this will contribute to the characterization of language development in both this population and in the context of SLI and, possibly, lead to discovery of ways in which development in these two contexts diverges.

This chapter will discuss the clinical characterization of Specific Language Impairment and the different theoretical approaches to research on this disorder. The ways in which SLI is diagnosed, treated, and studied in France will be emphasized. Research conducted under the computational complexity hypothesis (Jakubowicz 2005) will be reviewed and contributions from this approach to the research on SLI will be highlighted. Because this approach has yielded promising results when applied to the SLI context, applying this hypothesis to the context of L2 acquisition is appealing. In particular, we will review results on the frequency of subordinate clauses as well as error rates in the spontaneous speech of children with SLI, as this methodology has yielded interesting results on the developmental patterns of affected individuals.

3.2 What is SLI?

3.2.1 Definition and diagnostics

Specific Language Impairment is a disorder in which severe language deficits are present in the absence of an obvious explanation, such as sensory or severe cognitive impairment (Bishop 2004; Leonard 1998). These children are slow to begin to talk and continue to lag behind their age-matched peers, sometimes into adolescence and beyond (Conti-Ramsden 2008). Children with SLI appear to develop normally, with the sole exception that their language does not develop as easily and as quickly as expected, hence the term “specific” is used in order to single out language as being the primary symptom in this disorder. There is no known principle cause of SLI; however, it is widely accepted that there is a genetic component to this disorder. Family aggregation studies showed that SLI is more prevalent in families of affected children than in control populations and the results from twin studies revealed genetic effects on language difficulties (Stromswold 1998; 2001).

SLI is diagnosed after ruling out other potential causes for impairment. The exclusionary criteria include hearing loss, frank neurological trauma, oral motor deficits, autism disorders, child abuse, and mental retardation (Leonard 1998). Traditionally, children diagnosed with SLI display a significant discrepancy between verbal and nonverbal IQ scores. Most research on SLI requires the participants to score well below age norms on a battery of standardized language tests, but have a non-verbal IQ of at least 85[36] for inclusion in studies.[37] There is currently no precise agreement on any positive criteria for the diagnosis of SLI (Botting & Conti-Ramsden 2004), although some sort of characterization of the language impairment is necessary for diagnostic purposes. This is most often done via a composite standard score based on a battery of tests which evaluate different linguistic domains. For a diagnosis of SLI, the cutoff composite score is typically set at -1.25 standard deviations or lower, but this can also vary. In addition to arbitrary and inconsistent cutoffs for defining the clinical populations, other problems with the use of standardized tests have been documented. Some issues include the absence of standardized tests for some languages, inadequate descriptions of the child’s language problems, and a lack of consensus around which tests to use (Thordardottir et al. 2010; Leonard 1998).

Moreover, diagnostic practices of SLI can vary within and across linguistic communities, which has an important impact on cross-linguistic research. The way that SLI is diagnosed in France differs in important ways from the practices of many other countries. Although much of the research on SLI in France has adopted the term TSL (*Trouble Spécifique du Langage*), the label “dysphasia” (*dysphasie*) is still used in clinical practice (Jakubowicz 2007; Jakubowicz & Tuller 2008). French clinicians oppose the labels d*ysphasie* (SLI) and *retard*

[36] Some studies in France have included children with nonverbal IQ scores as low as 75 or 80 (Jakubowicz & Tuller 2008).
[37] The usefulness of cognitive referencing as a diagnostic standard has been called into question by some experts (Tomblin 2008; Cole, Dale, Mills 1990; Lahey 1990; Plante 1998; Tomblin 1999). For example, Tomblin & Zhang (1999) showed that affected children with nonverbal IQs above and below 85 had similar patterns of language deficits and differed only with respect to the severity of the impairment.

(simple) du langage ("simple language delay"), which is the equivalent of the term "late-talker." A child with language delay will be labeled as a "late-talker" until an age is reached at which more reliable nonverbal intelligence scores are available (around five or six years old). Moreover, diagnosis at a later age assures the clinician of the severe and long-lasting character of the impairment. Therefore the diagnosis of SLI in France is typically not confirmed for children who are younger than five, which makes the official age of diagnosis of SLI in France considerably older compared to most English-speaking countries and compared to other French-speaking countries, such as Canada and Switzerland (Jakubowicz & Tuller 2008).

SLI affects approximately 7% of the population. This number has been very frequently cited since Tomblin et al.'s (1997) epidemiological study, which was carried out on a group of over 6,000 kindergarteners in the United States. However, this number can vary depending on how the disorder is identified (and at what age), which, as we have just seen, can be the subject of some debate and differ depending on local clinical practices. Everyone agrees that SLI is more prevalent among males than females, with ratios averaging out at over 2:1 (Leonard 1998).

If there is still some debate about diagnosing SLI in monolingual children, the identification of SLI in bilingual populations faces even more serious obstacles. This has especially led to over- and under-identification of SLI in bilingual children. Over-identification refers to instances in which a clinician diagnoses language impairment in a child when the child is in fact healthy. Under-identification describes the opposite pattern: a clinician may attribute any language difficulties on the part of a bilingual child to the bilingual developmental context and assume that the problems will dissipate after more exposure to the target language (Paradis et al. 2011). The misidentification phenomenon can be observed in the relatively high numbers of bilinguals in special education and language therapy. For example, Bedore & Peña (2008) report patterns of under-identification for younger Latino-American children and over-identification in the school-aged children of the same population.[38] Problems with

[38] Citing www.ideadata.org/PartBreport.asp, these authors report lower rates of younger Latino-Americans (aged 3-5) in special education for speech language disabilities compared to mainstream European-American children (2.03% versus 3.21%). For learning disabilities, the enrollment rate was slightly higher in Latino-American children compared to European-Americans (0.18% versus 0.1%). However, in school-aged children (6-21 years), enrollment for Latino-Americans was 1.52% for speech language disabilities and 4.69% for learning disabilities (relative to 1.75% and 3.98% for the mainstream population). The authors note that the differences between these percentages are very small, but they nevertheless translate to practical differences in terms of numbers of children enrolled in services across the United States.

misidentification in bilingual populations have also been documented for Arabic-speaking children in Sweden (Salameh et al. 2002) and for bilingual children from various backgrounds in the UK (Crutchley et al. 1997). To my knowledge, one small, retrospective study has been conducted on the percentage of bilingual children in special education services in France (Kohl et al. 2008). Although they were only able to study a small number of participants (16 bilinguals and 31 monolinguals), these authors noted that the proportion of patients with SLI was the same in the bilingual (12.5%) as in the monolingual group (12.9%). The authors speculated that language difficulties in bilingual children might be considered by some to be part of their normal development, and therefore, these children were not being referred for evaluation.

The lack of reliable and valid diagnostic tools specifically designed for bilinguals constitutes a major challenge to accurate identification of SLI in bilinguals. Bedore & Peña (2008) emphasize two issues which can cause incorrect assessment of bilinguals: problems with the translation of standardized tests and the composition of norm-reference population. In some languages little has been documented about normal first language development and/or no standardized tests exist. Although the translation of existing standardized tests from one language to another in these cases has been frowned upon, this practice continues to occur. The simple translation of a test from one language to another often results in a completely unreliable tool because important features of the target language are very likely to be missed. For example, morphosyntactic properties which are acquired early in one language might be acquired late in another and translation equivalences do not necessarily take this into account. In addition, translated tests might not include important markers of SLI in the target language (Paradis et al. 2011; Bedore & Peña 2008).

A second barrier to accurate identification of SLI in bilinguals is the constitution of the norm-referencing population. The adaptation of existing standardized tests for use on individuals who are not from the norm-referenced population has created serious validity issues due to cultural and linguistic differences across communities. Although it has been shown that bilingual (especially sequential bilinguals) and monolingual children can differ in important ways, the population used for the standardization procedure is almost always monolingual. This often puts bilinguals at a disadvantage, which can result in an underestimation of their capabilities in the target language. The valid reference population for bilinguals is a larger group of bilinguals who are in similar language-learning contexts; however, standardized assessments based on bilingual norms are few and far between (Paradis et al. 2011; Bedore & Peña 2008).

Although there is wide consensus that language is the primary deficit in children with SLI, other non-linguistic deficits have been thoroughly documented in the literature (Leonard 1998; Kohnert 2008). Problems with working memory (Gathercole & Baddeley 1990, 1993), general cognitive processing, and executive functions have been explored as potential ways to identify and characterize those affected by SLI. For example, there is considerable evidence that children with SLI perform less efficiently on non-linguistic processing tasks such as fine motor sequencing and cognitive imaging tasks (see Leonard 1998; Kohnert et al. 2009 and sources cited therein). The question remains as to whether these processing problems cause the language impairment or if both the processing and language issues are related to a separate underlying cause (Kohnert et al. 2009). A third possibility could be that the language impairment might cause processing difficulties. In a recent study on the development of language and working memory, Zebib (2009) argued that language acquisition feeds the development of working memory. If this idea is on the right track, then language impairment might lead to deficits in working memory.

3.2.2 Subtypes

As we saw with research on child L2 acquisition, the heterogeneity of the population diagnosed with SLI is considerable and presents major challenges for researchers and clinicians. Children with SLI do not form a homogeneous group, but present a range of profiles which have in common severe language difficulties in the presence of normal cognitive abilities (Botting & Conti-Ramsden 2004, p 23). Children with SLI can present various types of deficits in different language domains (phonology, morphology, syntax, semantic, and pragmatics) and the extent to which their expressive or receptive modalities are impaired also varies. To complicate matters further, the profile of an individual child with SLI can vary over time (Botting & Conti-Ramsden 2004). According to the renowned Rapin & Allen (1983) system, the most prevalent subtype is “phonologic-syntactic deficit syndrome” in which affected children display substantial difficulty in the production of morphosyntax and phonology and only mild problems with comprehension. Another subtype in this system is termed “lexical-semantic deficit syndrome” in which the child’s major deficits concern lexical access, while their production of morphosyntax and phonology is relatively spared (Leonard 1998). DSM-IV (American Psychiatric Association) and the World Health

Organization (1992) also described different subtypes of SLI, which include the phonologic-syntactic category. In clinical practice in France, this subtype is recognized and is used most often in research. The lexical-semantic type is also recognized by clinicians and researchers in France, although it is much less common (Jakubowicz & Tuller 2008).

Although some different studies converge on similar subtypes of SLI, much progress remains to be had in regards to the validity of these categories. These subgroups often do not adequately describe an individual child as there can be considerable variation within a subgroup (Leonard 1998).

3.2.3 Persistence

SLI is generally considered to be a condition that lasts into adolescence and adulthood. However, because of the heterogeneity and the different profiles that a child with SLI can present over time (see above discussion), a certain number of children have been shown to no longer display the same severe language deficits after a certain age (Botting & Conti-Ramsden 2004; Bishop & Edmundson 1987). Although some children appear to "resolve" some of their language difficulties, a vast majority of them do not. Research on language-impaired adolescents and adults had found that affected individuals continue to experience persistent (although sometimes subtle) difficulties in morphosyntax, phonology and written language (Aram et al. 1984; Tomblin et al. 1992; Tomblin 2008; Conti-Ramsden 2008; Bishop & Edmundson 1987; Audollent & Tuller 2003; Tuller et al. 2011). For example, Conti-Ramsden & Durkin (2008) studied a group of 118 children with SLI from age 7 until age 16. These authors revealed that 85% of these affected individuals continued to score at -1 standard deviation below the mean on standardized tests evaluating expressive and receptive language. Recent studies have also shown that the well-documented problems that English-speaking children with SLI have with tense marking continue into adolescence (Miller et al. 2008; Rice et al. 2009).

3.3 Clinical Markers

In the previous sections of this chapter the concept of SLI was introduced and some challenges to the accurate diagnosis of SLI in bilingual populations were presented. In this section, potential clinical markers for SLI will be discussed. One objective of research on SLI is the identification of clinical markers of this disorder. A clinical marker is a specific behavior which is exhibited by the impaired, but not the unimpaired population, thereby allowing a distinction to be made between children belonging to one group or the other. In the approach adopted here, we will concentrate on linguistic-specific markers. Previous research has identified tense marking to be a solid clinical marker of SLI in children who speak Germanic languages. For Romance languages, much attention has been paid to the problems that impaired children have with object clitics. Because of this study's focus on a comparison with an English-speaking L2 population, we will review what is known about gender marking by French-speaking children with SLI.

3.3.1 Tense-marking

The difficulties with inflectional morphology exhibited by children with SLI have been a staple in the search for clinical markers. In typical L1 development of a wide variety of languages, children go through a stage in which they optionally produce infinitives in contexts requiring a finite form. This stage, which can occur from the two-word stage until about 3 years of age, has been referred to as the Optional Infinitive (OI) or the Root Infinitive (RI) stage. Many studies on impaired and unimpaired language acquisition have focused on this developmental phenomenon because it occurs in different languages and it contributes to the debate about the status of functional categories in early grammars.

Although RIs have been observed in the early grammars of many languages, the OI stage is not universal. It has been argued by many that the OI stage does not exist in pro-drop languages, or if it does, RIs are very rare and occur within a very small window of time (see Hamann 2003 and references cited therein). Cross-linguistic comparisons of children in the OI stage point to differences in the frequency of RIs, which have been attributed to differences in the richness of the inflectional paradigm. Rates of RIs tend to be higher for Germanic languages, lower for French, and very low for Catalan, Spanish, and Italian (Rasetti 2003). Rasetti (2003) and Hoekstra & Hyams (1998) compiled a list of RI rates across different languages for children aged between 1;6 - 3 years. According to these data, the children with the highest RI rates were English (range: 75-81% from Hoekstra & Hyams 1998) and German (13-73% from Weissenborn 1990). French-speakers appeared to fall in the middle at between 20-49% (citing Pierce 1989), while the lowest rates were for Catalan (3% citing Torrens 1992), Spanish (5-12% from Grinstead 1994) and Italian (0-16%, citing Guasti 1994; Schaeffer 1990). Additional analyses of longitudinal corpora of TD French-speaking children (aged between 1;8.14 and 3;3) reported RI rates between 9-40% (see Prévost 2009 and references cited therein). However, Jakubowicz et al. (1998) noted only approximately 10% infinitives in an elicited production experiment with young TD French children in Paris.

Despite the different RI frequencies observed in the previously mentioned studies, a typically-developing child leaves the RI stage around the age of 3. However, for children with SLI, this stage continues until a much later age. For example, English-speaking children with SLI have been shown to exhibit behavior associated with the OI stage until age 8 (Rice, Wexler & Cleave 1995; Rice et al. 2011). Therefore, the principal difference between affected and unaffected children is the age at which the child leaves the RI stage. Rice & Wexler (1996) and Rice, Wexler & Cleave (1995) termed the behavior associated with this protracted development the Extended Optional Infinitive (EOI) stage. Cross-linguistic studies showed that children with SLI who speak languages in which an RI stage has been documented had linguistic performance that could be characterized by the EOI stage; however, the rates of RIs appeared to mirror the differences in frequencies found in the studies on typically-developing children. For example, the highest RI rates were documented for TD English-speaking children and English-speaking children with SLI also experience more difficulty with RIs. For example, Leonard (2000, cited by Orgassa 2009) reported that English-speaking children with SLI had 21% accuracy for present tense verbs in the 3P singular compared to 53% for age- and MLU-matched German-speakers with SLI and 94% for Italian-speakers with SLI. For French-speaking children with SLI, there is a substantial amount of individual variability. However, it appears that the French-speaking children with the most severe cases of impairment (who also tend to be younger) produce the highest rates of root infinitives. For example, out of the 11 children from the Geneva project (aged 3;10 - 7;11) whose spontaneous language was studied longitudinally by Hamann et al. (1996), two of the younger children (3;10 and 4;9 years old) produced root infinitives in 70% (14/20) and 68.6% (22/32) of their respective verbal utterances; whereas the rest of the children had rates under 13%.

In addition to the overuse of non-finite forms, children with SLI have been shown to overuse present tense forms in past tense contexts. Rice, Wexler & Cleave (1995) reported omission of the past tense marker *–ed* for English-speaking children with SLI. Jakubowicz & Nash (2001) used an elicited production (sentence completion task) and a comprehension task (sentence-picture matching task) to evaluate the performance of 28 French-speaking children with SLI (aged 5;7 to 13 years) on the present and compound past (passé compose). Based on their performance, the authors placed the children into 3 different groups: SLI1 (N = 6; mean age = 9;8; *SD* = 2;0) had the highest scores, SLI2 were less accurate (*N* = 10; mean age = 8;2; *SD*, 1;7), and SLI3 included the children with the lowest scores, who were also the youngest (*N* = 12; mean age = 6;10; *SD* = 2;1). Concerning production scores, the SLI2 and SLI3 groups scored significantly below a control group of TD 12 6-year-olds as well as the SLI1 group for both tenses. The SLI3 group also scored significantly lower than the control group of TD 12 4-year-olds for the present. The SLI2 and SLI3 groups scored significantly higher on the present compared to the past; whereas the SLI1 and 6-year-old controls had equally high scores for each tense in production. The same overall pattern was also found for the comprehension scores. As far as production error types go, non-finite verbs in finite contexts were produced only by the SLI2 and SLI3 groups at a mean rate of 7.1% and 17.4%, respectively. The results of this study show that the children with SLI form different subgroups, as evidenced by their radically different performance on the experimental tasks. Furthermore, the children with the most severe impairment had the most difficulty producing the past tense and were the only ones to use root infinitives.

Paradis & Crago (2001) also investigated the accuracy of inflectional morphology produced in spontaneous speech by 7 French-speaking children with SLI from Montreal. The rate of correct production of verb forms by tense type (present, past and future) was calculated and compared to a two control groups: 10 MLU-matched typically-developing 3-year-olds and 10 age-matched typically-developing 7-year-olds. The results showed that the SLI group differed only in their production of the past and future tenses, but patterned with the controls for the present. In addition, the SLI were significantly more accurate in their production of present tense compared to past and future; whereas the control groups performed the same for all tense types. Most tense errors made by the SLI involved the overuse of the present tense or the use of non-finite forms in finite contexts. The authors conclude the tense realization is vulnerable in French-speaking children with SLI, as it is for affected English-speakers (e.g., Rice & Wexler 1996).

The review of tense marking as a clinical marker suggests that this may very well be the case for English and other Germanic languages. French-speaking children with SLI with severe impairments appear to pass through a RI stage, but they also appear to come out of this stage more quickly than English-speaking children. Therefore, tense as a clinical marker for the French context may only be (somewhat) reliable in identifying young children or children with severe impairments. However, if the bare form of the verb (which corresponds to the present tense form for most of the paradigm) is considered a non-finite form, then this marker could potentially be used for a larger range of ages. The tendency for children with SLI to overuse the present tense and avoid the compound past could potentially be used to discriminate typically-developing children from children with SLI.

3.3.2 Object clitics

Object clitics are also considered a clinical marker for French-speaking children with SLI. French and other Romance languages have clitic systems for the realization of subject and object pronouns (see Chapter 5 for the full paradigm and debate about the syntactic status of clitics in French). Recent studies have revealed that object clitics are acquired particularly late in typical acquisition (e.g., Zesiger et al. 2010; Hamann et al. 1996; Jakubowicz & Rigaut 2000) and pose particular problems for children with SLI (Jakubowicz, Nash, Rigaut & Gérard 1998; Tuller et al. 2011). A significant delay between the acquisition of subject and object clitics has been widely documented for impaired and unimpaired French-speaking children (Hamann et al. 1996; Jakubowicz et al. 1998; among others). In the spontaneous language of young typically-developing children, subject clitics are produced beginning at approximately 2 years old; whereas the appearance of object clitics does not occur until about 9 months later (see Grüter 2006 for a review). The same dissociation between subject and object clitics are observed in elicited production tasks (e.g., Jakubowicz et al. 1998). For example, Zesiger et al. (2010) found that object clitics were omitted at a rate of 21% by 4-year-olds, while subjects were omitted at 7.8%. In the group of 6-year-olds, both subject and object omission dropped to under 5%. These results suggest that the production of object clitics is not mastered in typically-developing children until sometime between 4 and 6 years old (see also Jakubowicz 2003). In fact, later work on older children revealed that the production of the accusative 3rd person clitic continues to increase between ages 6 and 11 in TD children (Tuller et al. 2011).

However, for French-speaking children with SLI, the object clitic delay is much more pronounced, with some affected individuals never fully mastering the production of these elements. This result has led researchers to pursue object clitics as a clinical marker for SLI in the French context. In particular, accusative clitics appear to be omitted regularly by children with SLI. Using an elicited production experiment on a group of 13 children with SLI (aged 5;7-13;0, mean 8;11) compared to 20 TD children (aged 5;6 - 5;11; mean 5;7), Jakubowicz et al. (1998) found that the SLI produced higher rates of nominative clitics (75.4%), somewhat lower rates of reflexive clitics (56.7%) and catastrophically lower rates of accusative clitics (25.2%). Instead of producing an accusative clitic, the SLI group tended to omit the clitic or use a discursively infelicitous lexical DP. However, the comprehension scores of the SLI group were considerably higher than production and on par with the TD group's comprehension scores (reflexive: 86.5% and accusative: 80.1%).

Previous research has shown that TD French-speaking children master object clitics later in development. When looking at French-speaking children with SLI, this delay is amplified. Comparing the spontaneous data of two different age groups of children with SLI (*N* = 6 aged 3;10 – 5;0 and *N* = 5 aged 5;7 - 7;11), Hamann et al. (2003) noted that the rate of object clitic production in spontaneous speech did not change with age, but remained at about 20% in obligatory contexts. In a longitudinal study based on an elicited production task, nominative and reflexive clitics were produced at target-like rates by children with SLI (mean age, 9;1; *SD*, 1.3), but accusative clitics continued to be omitted at a mean rate of 60% (Jakubowicz 2003).

Given the results for object clitics (especially the third person accusative clitic) in older French-speaking children with SLI, it is interesting to report on what we know about their performance at adolescence. The production of nominative, reflexive and accusative clitics by older atypically-developing French-speaking children and adolescents was evaluated via an elicited production task by Tuller et al. (2011). These authors included the following groups: 1) 37 individuals with SLI, aged 11;5 - 20;5 (mean age = 14;8; *SD* = 2;11); 2) 19 individuals with mild to moderate hearing loss, aged 11;9–15;1 (mean age = 13;8; *SD* = 1;1); 3) 15 individuals with Rolandic Epilepsy[39] aged 11;3–16;10 (mean age = 13;6; *SD* = 1;9) and compared their performance to a group of 24 typically-developing 6-year-olds and 12 11-year-olds. The results showed that all three atypically-developing groups had significantly lower rates of production of the third person accusative clitic compared to controls, with the SLI producing this element at a rate of 49.7% (*SD* = 31.9), compared to the other two groups whose mean rates were between 80 and 85%. Their performance patterned with the control groups for the first person accusative, as well as for nominative and reflexive clitics. Interestingly, there is no significant correlation between age and third person accusative

[39] Rolandic epilepsy (RE) is classic focal, idiopathic epilepsy. Also referred to as benign epilepsy of childhood with centrotemporal spikes, it involves limited abnormal electrical discharges over the centrotemporal region beginning in childhood (age 3–13), but ending before adulthood. Electrical discharges in this form of epilepsy are localized in perisylvian language areas; and therefore this developmental context is of interest to acquisition studies (see also, Monjauze 2007) (Tuller et al. 2011a, p. 429).

production in the three atypical groups, despite the wide age ranges. These results suggest that the third person accusative is never fully acquired by children with SLI, but also represents an obstacle to children who did not acquire language in an optimal context.

3.3.3 Gender

Deficits in the verbal domain have been at the center of much of the research on clinical markers of SLI. There have been relatively fewer studies on the nominal domain; however, a handful of studies have examined grammatical gender agreement in French-speaking children with SLI. As we saw in Chapter 2, much attention has been paid to how children who are acquiring French as an L2 mark grammatical gender. It seems interesting, therefore, to analyze gender agreement in SLI in addition to inflectional morphology and object clitics. In the following sections, we will review what is known about gender agreement in impaired and unimpaired monolingual French speakers.

In the French system, nouns are associated with feminine or masculine gender. Gender is marked on singular determiners, nominative and third person accusative clitics, adjectives, nouns, and the quantifier *tout* (‘all’) (see Chapter 5 for a more detailed explanation and analyses). Whether a noun is feminine or masculine is arbitrary, and while gender assignment is strongly correlated with the ending of a noun, it is difficult to formulate regularities without long lists of exceptions (see Prévost 2009; Ayoun 2008).

Most studies on gender in typically-developing French children have concluded that gender marking is acquired relatively quickly and easily, although some variability among children has been noted (Clark 1985; Rondal et al. 1999). When errors are reported, children tend to overuse the masculine in the context of a feminine noun (Clark 1985). Children in early stages of development appear to assign gender based on the morphophonological form of the noun and use syntactic clues later on. Karmiloff-Smith (1979) administered an elicited production task in which the children were presented a made-up noun which was introduced by an indefinite determiner or numeral. The nouns were given endings that were either typically masculine (e.g. *bicorn*) or feminine (e.g. *plichette*). There was a match condition in which the gender marked on the determiner corresponded to the noun ending, a mismatch condition in which the determiner did not correspond to the gender associated with the ending, and a third condition in which no gender information was communicated via the use of a numeral. The children were asked to repeat the nouns using the definite determiner. Based on the gender marked on the determiner in their responses, children younger than 6 tended to assign gender according to the phonological form of the word, but by age 9 they were more sensitive to the form of the determiner used by the experimenter.

Maillart (2003) studied the elicited production of gender marking on adjectives, third person nominative and accusative clitics as well as the comprehension of these same elements in addition to the definite determiner. The participants in the study were 45 typically-developing children (15 4-year-olds, 15 8-year-olds, and 15 10-year-olds). In production, all three groups scored at 90% or above for gender marking on adjectives and subject clitics. However, the 4-year-olds scored significantly lower than the older children for correct gender on accusative clitics (4-year-olds: 62%; 8-year-olds: 84%; 10-year-olds: 85%). An error analysis on the 4-year-olds' performance revealed that these younger children did not have a problem with omission of the accusative clitics, but rather over-generalized masculine clitics in feminine contexts. Concerning comprehension, again the 8- and 10-year-olds performed at ceiling for all categories, but the 4-year-olds performed at chance levels for subject clitics and adjectives. For determiners and accusative clitics, over half of the 4-year-olds were above chance. Maillart explained that a methodological problem is behind the chance-level performance for subject clitics which affect the 4-year-olds, but not the older children. No gender effect was observed for comprehension scores. In other words, the children comprehended masculine marking just as accurately as feminine marking. Overall, most studies based on elicited production experiments which test gender marking on the definite determiner report perfect command of gender by 3 or 4 (Prévost 2009; van der Velde 2003; Hawkins & Franceschina 2004). Maillart's study revealed that development may continue beyond 4 years for the production of correct gender marking on accusative clitics and that the younger children apparently do not consistently use gender clues to identify the referent in a comprehension task.

Using the same testing procedure, Maillart (2003) compared the typically-developing children to a group of 17 children with SLI (aged 7;4 - 13;3). In production, the children with SLI scored significantly lower than the 4-year-olds on all three elements (nominative clitics, accusative clitics and adjectives); however, their performance in comprehension was similar across the board. Perhaps unsurprisingly, in the production experiment, the children with SLI omitted accusative clitics at a very high rate that did not appear to be affected by the gender context (68% omissions in masculine contexts and 67% in feminine contexts). In general, errors in production were overgeneralizations of the masculine in feminine contexts. There was a substantial amount of variability within the SLI group. The examination of individual profiles revealed two rather distinct sub-groups: 1) those that had very low scores in production and chance scores in comprehension and; 2) those who, in production, marked nominative clitics correctly at least 69% of the time, were generally accurate with adjectives, and had comprehension scores above chance.

In another series of experiments targeting the production and perception of gender marking on French-speaking children with SLI, Roulet (2007) found that although children with SLI do not always correctly mark gender in production, they are sensitive to grammatical gender violations in on-line tasks. Roulet tested 18 children with SLI (aged 6;11 – 11;3; mean age = 8;9; *SD* = 1;4) and 18 typically-developing children (aged 6;5-6;7; mean age = 6;6; *SD* = 0;1) using the following tasks: 1) an elicited production task in which the child was prompted to use the indefinite determiner in identifying an object that appeared in a picture; 2) a on-line task in which the children were presented with an audio stimulus consisting of a definite determiner and noun and were asked by the experimenter whether the noun belonged to a certain semantic category or not. Half of the test items belonged to a match condition in which marking on the determiner matched the gender of the noun and the other half consisted of items in which the form of the determiner did not match the gender of the noun. Reaction times and response accuracy were recorded to see if the children were sensitive to the gender violation (i.e., had longer reaction times in the mismatch condition). Results from the production task showed that the TD children made zero errors in gender marking and zero determiner omissions. Although the SLI children had relatively good performance in the production task, they nevertheless made more errors than the TD children. Out of 72 total items, the children with SLI made a mean number of 5 gender errors (*SD* = 8.3) and omitted a mean number of 12.6 (*SD* = 20.3) determiners. The older children with SLI tended to commit fewer gender errors than the younger children, although there was again a great amount of variability, with one of the older children committing a total of 33 gender errors. Despite the SLI group’s performance in production, the analysis of the reaction times showed that, like the TD group, the SLI had longer reaction times in the mismatch condition, which suggests that they are sensitive to the gender violation between the determiner and the noun. Interestingly, there was no correlation between correct gender marking in production and the difference in reaction times between the match and mismatch conditions. In other words, the children who made more errors in production were just as sensitive to the gender violation in the on-line task as the children who made fewer errors.

All in all, research conducted on gender marking in French-speaking children with SLI suggests that while not all children with SLI have problems with gender, on a group level, children with SLI typically make more errors in gender when compared to much younger, typically-developing children. Maillart's (2003) results appear to show that children with the most severe cases of impairment are more likely to also have problems with gender. The lack of correlation with age in these studies may show that the difficulties with gender in the most severe cases might not be resolved with age.

This section reviewed the definition of and diagnostic criteria for SLI. Challenges faced by clinicians in the identification of SLI in bilingual children were discussed. Bilingual children are often disadvantaged by the monolingual makeup of the norm-referencing populations used by most standardized assessments. Furthermore, the clinical markers that have been proposed for French include verb morphology and object clitics. As seen in Chapter 2, these properties are not acquired easily or quickly by L2 children either. The following section (3.4) will review different theoretical approaches to SLI.

3.4 Underlying Nature of SLI

The underlying nature of SLI is currently a debated topic in the literature. Oftentimes, hypotheses on the locus of the deficit in SLI fall into two camps: so-called domain-general and domain specific hypotheses. The former assume that limitations in general cognitive processing are behind the problems associated with SLI; whereas the latter assume that the locus of the deficit in SLI resides within the linguistic module itself. There are also a number of hypotheses that assume an interaction between linguistic and general cognitive processes. In this section we will briefly review the basic ideas behind these types of approaches.

3.4.1 Domain-general Hypotheses

As mentioned earlier, although the primary issue in SLI concerns language, one robust finding in the literature on SLI is that affected children also exhibit subtle non-linguistic weaknesses. Domain-general hypotheses assume that these non-linguistic problems are at the heart of the disorder (Leonard 1998). For example, the Generalized Slowing Hypothesis (Kail 1994) considers that the profiles exhibited by children with SLI result from a problem of processing speed. His findings show that affected children consistently took longer to perform various types of tasks compared to their age-matched peers. The idea here is that these limitations in processing speed are behind the language delay observed in children with SLI.

The Surface Hypothesis, developed by Leonard and colleagues (Leonard 1998 and references cited therein), proposes to account for the problems with inflectional morphology encountered by children with SLI in terms of the interaction between general processing limitations and the acoustic properties of inflectional morphemes. For example, the relative brief duration and non-syllabicity of morphemes such as the third person singular '-s' in English, combined with the effort needed to understand the role of this morpheme is an overwhelming task for children with SLI and causes a delay in their analysis of, and consequently in their production of, the verbal paradigm. Children with SLI therefore require more time and exposure compared to other children in order to incorporate the necessary linguistic data into their grammars.

In an approach which centers on limitations in a more specific cognitive component, Gathercole & Baddeley (1990) attribute the linguistic profile of children with SLI to deficits in phonological working memory. This idea is based on data which show that children with SLI have more difficulty repeating non-words or recalling lists of words compared to unaffected language- and age-matched children. Limitations in phonological working memory are assumed to lead to difficulty in lexical learning which can also lead to problems in acquiring verbal argument structure.

This set of hypotheses assumes that the underlying grammatical representations of affected children are not impaired, but that the general processing limitations lead to problems with the analysis of linguistic data (i.e., intake). Therefore, the heart of the problem is domain-general processing, but this has consequences for representation (e.g., incomplete verbal paradigms) (Leonard 1998; Paradis 2010).

3.4.2 Domain-specific Hypotheses

Much attention has been paid to the description of morphosyntactic and phonological deficits displayed by children with SLI, which has given rise to hypotheses which assume that the underlying problems in SLI are specific to the cognitive module which is dedicated to language.

For example, Gopnik (1990) and Gopnik and colleagues (1991; 1997) advanced the idea that the linguistic profile of individuals with SLI is a result of an inability to acquire the grammatical rules which underlie morphological and phonological processes. This "Feature Blindness" approach considers that children with SLI do not perceive the internal structure of inflected words and therefore cannot develop rules for handling inflectional features. The optional use of correct morphology is explained through compensatory strategies, such as rote learning, which are used by the affected individual (see Leonard 1998 and Guasti 2002 for reviews).

In another approach which assumes a deficit in underlying grammatical rules, Clahsen's (1989) Missing Agreement Account claims that the deficits observed in SLI are a consequence of an inability to mark agreement (e.g., subject-verb, gender-number, case marking, etc.). Data from studies done with German-speaking children with SLI revealed that these children use tense morphemes correctly, but have trouble with inflectional morphemes that mark agreement Clahsen et al. (1997). In the same study it was also argued that English-speaking children with SLI successfully mark tense more frequently than agreement Clahsen et al. (1997). In a more recent version of this account (the Agreement Deficit Account), Clahsen (2008) proposes to describe SLI in terms of a deficit in the agreement operation which results in underspecified paradigms. The proposals by Gopnik and Clahsen account for certain patterns observed in production in English and German-speaking children; however, these representational accounts struggle to explain the intact comprehension abilities which have been observed in affected children (see previous section for grammatical gender in French, Roulet 2007; Jakubowicz 2007).

As mentioned in the section on tense marking as a clinical marker, children with SLI appear to remain in the Extended Optional Infinite Stage for much longer than typically-developing children (Rice, Wexler, & Cleave 1995; Rice & Wexler 1996). These authors therefore attribute inflectional morphology errors in impaired children to a selective deficit in the grammatical mechanisms which underlie the realization of tense. In typically-developing children, these mechanisms undergo maturation which brings an end to the OI stage (around 3 years of age); however, in children with SLI this maturation process is delayed, resulting in the EOI profile observed in older affected children. Wexler (1998) proposed to describe this restriction on immature grammars in terms of the Unique Checking Constraint (UCC, or the Extended UCC for SLI), which is stated in (21).

(21) Unique Checking Constraint:
The D-feature (determiner feature) of DP can only check against one functional category.

When a subject DP moves to check uninterpretable D-features against tense and agreement, the UCC does not allow both of these to be checked. Tense or agreement may therefore be omitted by the child in accordance with the UCC. In languages such as English, the omission of tense results in a bare (non-finite) form and the omission of agreement results in a non-nominative subject. This account also assumes that there is competition between the UCC and other grammatical rules which require that D-features be checked against both tense and agreement. This competition explains the variability in tense marking in young, typically-developing and impaired grammars (Wexler 1998). To explain the absence of a RI stage in pro-drop languages, Wexler (1998) assumes that in these languages, subject DPs carry an interpretable D-feature which does not have to be checked against agreement, so these grammars can check once against tense in accordance with the UCC. Therefore, tense is not omitted in these languages. The UCC also predicts the omission of object clitics in languages such as French because their derivation also requires the checking of two uninterpretable D-features (Wexler 2003).

Having observed the difficulties that children with SLI have in producing and comprehending syntactic structures such as passives and wh-questions, van der Lely and collaborators (van der Lely & Battell 2003; Marshall & van der Lely 2007; van der Lely 1998, 2005) formulated the Computational Grammatical Complexity (CGC) hypothesis (an updated version of the Representational Deficit or Dependent Relations (RDDR) hypothesis). The CGC posited that children with SLI have a deficit in the computational system which prevents syntactic dependencies involving movement from being formed. Results from different methodologies revealed that English-speaking children with SLI have consistent difficulty in correctly producing wh-questions (van der Lely & Battell 2003), in reactivating the trace in wh-questions in cross-modal priming (Marinis & van der Lely 2007), and in recognizing errors in both subject and object wh-questions, such as filled gap positions and absence of pied-piping (van der Lely et al. 2010). The results from both production and comprehension provided evidence for the idea that the underlying problem in SLI is a specifically syntactic deficit and does not involve domain-general processes (van der Lely et al. 2010).

These different domains-specific approaches share the idea that the nature of the deficit in SLI is specific to the syntactic module. They also have in common that the linguistic problems in children with SLI are caused by the restriction of a certain syntactic operation. In the proposals put forth by Gopnik and Clahsen, the operation *Agree,* which underlies agreement marking, is claimed to be impaired. The UCC (Wexler 1998) describes the problems in terms of a limitation in the number of features that can be checked, and the CGC considers the deficit lies in the syntactic mechanisms which allow syntactic dependencies to be formed. The restrictive notion shared by these hypotheses can also be related to the notion of economy, which describes the preference shared by all grammars to select the most economical operations in a derivation. In the following section, we will discuss accounts which are formulated in terms of economy and which appear to integrate aspects of both the domain-specific and domain-general hypotheses.

3.4.3 Interaction between the Language Module and Performance Systems

The Principle of Structural Economy ("use the minimum of structure consistent with well-formedness constraints") and Categorical Uniformity ("assume a unique canonical structural realization for a given semantic type") (Rizzi 2000) were developed to describe acquisition in young typically-developing children, but have been used to explain patterns of impairment in SLI. If children with SLI have grammars which simply develop more slowly than normal, then the deficit in SLI may be explained by proposals which also account for phenomena observed in (very) young typically-developing children (van der Lely et al. 2010). The idea here is that young TD children use grammatical options such as null subjects, not because their processing system overrides their grammatical representations (competence), but because certain constructions are preferred because they involve a lower processing load (Rizzi 2000).

Jakubowicz and colleagues showed that the domain-general hypotheses, such as the Surface Hypothesis, could not explain why children with SLI successfully produce definite determiners in French while they have such difficulty with the homophonous accusative clitic (Jakubowicz et al. 1998). Jakubowicz also observed a production-comprehension dissociation in the performance of children with SLI (Jakubowicz et al. 1999; Jakubowicz & Nash 2001; see also Grüter 2005). French-speaking children with SLI omitted object clitics frequently in production; however, they had better performance in the comprehension of the same elements. As explained previously, this type of pattern cannot be explained by a strictly representational deficit as adopted by many domain-specific hypotheses. Jakubowicz (2004, 2005, 2007) therefore argued, following Gibson (1998), Rizzi (2002), and others, that difficulty with constructions which entail high computational complexity can be attributed to limited working memory capacity.

When compared to the approaches reviewed here, it appears that Jakubowicz's proposal attempts to integrate certain aspects of both the domain-specific and domain-general hypotheses. Jakubowicz suggested that the patterns observed in young TD and impaired populations were the result of an immature processing system (working memory) and the way it interacts with the computational system. Jakubowicz (2004, 2005) "proposed that (ab)normal language build up is affected by developmental constraints such as the capacity of working memory, which are sensitive to the computational complexity of the derivation" (Jakubowicz 2011, p. 340). In other words, if the computation system performs a complex derivation (defined by the number and nature of operations involved), the processing system which interacts with the computational system can become overloaded. Young TD and impaired children, whose processing systems are immature due to young age or a developmental disorder such as SLI, will avoid derivations involving complex computations in order to alleviate the demands on the processing system.

3.4.3.1 SLI and the Derivational Complexity Hypothesis

In addition to her contributions to the question of the nature of SLI, Jakubowicz also focused on the link between computational complexity and acquisition. She carried out a series of studies on French-speaking children with SLI within a framework based on the notion of economy (in the sense of Chomsky 1995). Her general working hypothesis, called the Derivational Complexity Hypotheses (DCH), stated that derivational complexity constrains language development in typically developing children and children with SLI such that "less complex derivations are input convergent (i.e., correctly spelled out and 'pronounced' at the interfaces) before more complex ones" (Jakubowicz 2010 p. 340). In other words, less complex derivations should emerge before more complex ones in the course of language development. Jakubowicz's hypothesis led to interesting results concerning typical development and development in the context of SLI, as well as other language contexts in which acquisition does not proceed under optimal circumstances (see Delage 2008 for mild-to-moderate hearing loss and Monjauze 2007 for Rolandic Epilepsy). In this thesis, the DCH will be extended to the comparison of language development by children with SLI and by children learning a second language, and as such, a more extensive review of previous work carried out under this framework will be undertaken.

Previous research conducted with the goal of better understanding the link between complexity and acquisition sequences had pointed to the avoidance of movement as a reliable characterization of young grammars in development (Jakubowicz & Nash 2001; Jakubowicz 2003; Van Kampen 1997, Hulk et Zuckerman 2000; Zuckerman 2001; among others). For example, Van Kampen (1997) showed that typically-developing children first acquire constructions that require less movement and, in general, prefer derivations in which PF more closely resembles LF. Hulk & Zuckerman (2000) and Zuckerman (2001) suggested that when children have the option, they initially show preference for the more economical solution (i.e., the construction involving less movement).

Incorporating the idea that syntactic movement is a key factor in the definition of complexity, Jakubowicz (2005) proposed the Derivational Complexity Metric (henceforth, DCM, stated in 22), which allowed the complexity of a given derivation to be measured in terms of the number of instances of internal merge (movement) and external merge (lexical insertion).

(22) Derivational Complexity Metric (DCM) (Jakubowicz 2004, 2005, 2010)

a. Merging α_i n times gives rise to a less complex derivation than merging α_i (n + 1) times.

b. Merge of α gives rise to a less complex derivation than Merge of $\alpha + \beta$.

Defining complexity in such a way also allows for specific predictions to be made about acquisition sequences in (a)typical children and about structures that will remain problematic for older children who have acquired language in non-optimal conditions (SLI for example).
Jakubowicz (2004; 2005; 2011; as well as Hamann 2006; Cronel-Ohayon 2004) found that results on the elicited production of wh-questions in French by children with monolingual children with SLI in French supported, for the most part,[40] the predictions of the DCM. French allows different types of questions which differ in the number of instances of movement (internal merge): Questions in which the wh-word remains in situ are analyzed as being the least complex by the DCM because the wh-element does not undergo overt movement and wh-fronted questions in which there is movement of the wh-word to the left periphery. Following the DCM, in situ questions are predicted to emerge before fronted ones

[40] See Strik (2008) for an alternate analysis surrounding long-distance wh-questions in French and movement at LF.

in young children and children with SLI should avoid fronted questions (see Chapter 5 for more details). As predicted by the DCM, children with SLI produce wh-questions using an in situ strategy more frequently than via a wh-fronting strategy, for questions types which allow both options.[41] Elicited production tasks of long-distance wh-questions show that children with SLI make use of a wide variety of strategies to avoid long-distance movement, including strategies which are not grammatical in (any variety of) adult French, but which do exist in other languages, such as partial movement questions and wh-copying.

The studies conducted by Jakubowicz and colleagues on Wh-questions in French revealed that children with SLI tend to avoid movement when elicitation tasks were used. The following section will discuss the avoidance complexity by TD children and children with SLI in spontaneous speech.

3.4.3.2 (Avoidance of) complexity in spontaneous speech

This thesis is focused in part on the analysis of subordinate structures in spontaneous speech. Since the population in the present study consists of somewhat older children (mean age 9;9; range 6-12), previous findings concerning the frequency of complex syntax in relatively older affected and unaffected children is relevant. We saw in the previous section that the Derivational Complexity Hypothesis predicts that impaired individuals will have difficulty with structures entailing a high degree of computational complexity. Previous research has generally shown that children and adolescents with SLI use complex syntax less frequently than their unaffected peers. Certain results point to the use of avoidance strategies on the part of individuals with SLI. While this general pattern of behavior is more or less predicted by Derivational Complexity Hypothesis, there is no consensus as to the precise, linguistic definition of what is complex about complex syntax.[42] In addition, many studies use complex syntax in the traditional sense of the term when referring to subordinate clauses, without referring to the debate on the linguistic definition of complexity. However, to avoid confusion over the exact meaning of the term "complexity", I will use the term 'clausal embedding' to refer to subordinate clauses within one sentence.

One approach to studying older individuals with SLI is to focus on phenomena which continue to develop after early childhood in typically-developing individuals (Tuller et al.

[41] For example, pourquoi 'why' cannot be in situ.
[42] Intuitively speaking, it appears that most linguists would agree that biclausal structures are more complex than monoclausal ones.

2012). Complex syntax is precisely one of these phenomena that increases with age. This has been shown through a gradual increase in the frequency of use of subordinate clauses (Loban 1976; Scott 1988; Scott & Stokes 1995; Scott & Windsor 2000). In this section, studies that looked at the frequency of complex syntax in the spontaneous speech of older typically-developing children and adolescents and age-matched individuals with SLI will be reviewed. Despite differences in how to define complexity, these studies showed that impaired populations can be characterized by their avoidance of complex syntax. In reviewing this literature, I will use the term complex syntax to refer to constructions in which a subordinate clause is embedded within a matrix clause (non-finite and finite complement clauses, adverbial clauses, and relative clauses).

Before reviewing studies on impaired populations, we examine briefly the criterion in (23), which was added to the DCM by Soares (2006) to account for the fact that subordinate clauses emerge later than simple matrix clauses in typically-developing children.

(23) Dependent C:
A category C that is specified for tense [Tense] is dependent if and only if C is in the domain of a superordinate category that bears a tense feature [Tense].

Although the later emergence of subordinate clauses could be (partially) predicted by the original DCM (Jakubowicz 2005) because sentences with a subordinate clause are generally longer than simple sentences (thereby implicating more instances of external merge) and typically (but not always, as in the case of complement clauses) involve movement, Soares presented evidence based on longitudinal spontaneous language data from young TD Portuguese-speaking children suggesting that the tense dependency between the matrix verb and the subordinate verb as well as the notion of embedding contribute to the complexity of the derivation.

Moreover, the DCM has been used to account for acquisition sequences; however, the following studies examined the frequency of clausal embedding and not their order of emergence. It has been argued that, generally speaking, the same constructions that are acquired later cause low scores in elicitation tasks and are also less frequently employed in spontaneous speech. Therefore, the relative frequency of a structure in spontaneous speech has often been interpreted as being indicative of the structure's stability in the grammar.

Based on the DCM framework,[43] Tuller et al. (2012) argued that subordinate clauses involve derivations that are computationally complex because there are typically more elements in the numeration when compared to simple utterances and because certain types of subordinate clauses involve movement. In addition, they proposed that the level of embedding of a particular structure should be included in those factors that increase the complexity of a derivation. Based on previous work on impaired populations which showed that impaired individuals tended to produce certain types of relative clauses which involved more shallow embedding, these authors argued that embedding is "a key ingredient in the complexity of a derivation" (Tuller et al. 2012, p. 3). These aspects of computational complexity allowed these authors to make predictions regarding the increase in syntactic complexity observed in the language of adolescents.[44]

The objective of Tuller et al.'s (2012) study was to find out if clausal embedding increases with age in French-speakers with SLI, as it does in typically-developing populations; or rather, if affected individuals adopt compensatory strategies in order to avoid computationally complex derivations. These authors analyzed the frequency and type of subordinate clauses in the spontaneous speech of a group of 18 older children and adolescents with SLI (mean age: *M* = 12;6, *SD* = 1;3, range: 10;11 – 15;7) whose performance was compared to three control groups of TD children (6-, 8-, and 11-year-olds). The results showed that the individuals with SLI produced fewer embedded clauses than their TD peers, which suggests the language of individuals with SLI at that age can be characterized by the adoption of avoidance strategies and that the frequency of embedding does not increase with age, as previous studies have shown with unimpaired populations (see Loban 1976, among others).

Tuller & Hamann (2010) reviewed factors from the acquisition and processing literature which contribute to the notion of complexity. These authors analyzed the frequency of certain types of relative clauses in the spontaneous speech of a group of 16 children with SLI (mean age: *M* = 11;7; range: 10;1-12;10) compared to four different groups of TD children (age groups consisted of 6-, 8-, 11-, and 14-year-olds). Their results showed that the 6-year-old control group (TD6) and the group with SLI produced more relatives with shallow embedding

[43] Specifically, they say that "the number of operations involved in a derivation (internal and external merge, as well as the feature calculations necessary for agreement and for Relativized Minimality)" is one kind of computational complexity (p. 8).
[44] Applied to young children, the DCM makes interesting predictions about acquisition sequences. The study of frequency and order of emergence in impaired populations has suggested that poor performance on a particular construction in elicited tasks is associated with lower frequency of use of the same construction in spontaneous language (Tuller & Hamann 2010).

compared to the older TD children and that object relative clauses were produced less frequently than subject relatives in all groups, but this asymmetry was more pronounced in the TD6 and SLI groups. From these results, they argued that depth of embedding and the nature of the intervener between a relative head and the gap distinguished between the types of relative clauses that were produced the most frequently versus those that were avoided. Therefore, these two factors are crucial to the explanation of the difficulty in producing relative clauses.

Furthermore, Hamann et al. (2007), using the same methodology as Tuller et al. (2012) found that a group of French-speaking children with SLI aged between 5;5 and 10;5 (*M* = 8;0; *SD* = 1;9) produced significantly fewer complex utterances[45] compared to a group of twelve 6-year-old and 12 8-year-old typically-developing children. Furthermore, they compared the aforementioned SLI group with an older group of older children and adolescents with SLI (aged 10;11 – 15;7, *M* = 12;6; *SD* = 1;2) and found that the rate of complex utterances did not significantly increase with age in the affected individuals. The conclusion from the studies cited above, which were based on the DCM framework and examined clausal embedding and types of relative clauses in French-speaking children and adolescents with SLI, reveal that impaired groups do not pattern with their peers in terms of the frequency of embedding in spontaneous language. Furthermore, the rate of clausal embedding or the frequency of relative clauses does not increase across different age groups in the impaired population. These results suggest that individuals with SLI continue to show signs of weakness with language as they age and that these can be detected via the frequency of the use of certain syntactic structures in spontaneous language.

Previous work on English-speaking children and adolescents with SLI has come to conclusions which are similar to those on French-speakers mentioned above (for English, see Scott 2003; Reilly et al. 2004; Marinellie 2004). These studies did not refer to a particular linguistic hypothesis about the nature of complexity, but they often use syntactic measures which are very similar to the ones described previously.

3.4.3.3 Morphosyntactic errors and complexity

In addition to the results on the avoidance of embedding, children and adolescents with SLI have been shown to make significantly more morphosyntactic errors in spontaneous speech

[45] I will use the term complex utterances to refer to utterances that contain a main clause and at least one subordinate clause.

(Scott 2004; Gillam & Johnston 1992; Reilly et al. 2004; Hamann et al. 2007; Audollent & Tuller 2003, Restrepo 1998; Dunn et al. 1996). For example, in one of the previously mentioned studies, Hamann et al. (2007) found that the children with SLI (aged 6-10) had a significantly higher error rate when compared to even the youngest control group (6-year-olds). Interestingly, the rate of complex utterances containing at least one error decreased with age, but the difference between the two age groups (6-10-year-olds versus 11-16-year-olds with SLI) was not significant. Tuller et al.'s (2012) study, cited previously (whose participants included 18 older children and adolescents with SLI (mean age: *M* = 12;6, *SD* = 1;3, range: 10;11 – 15;7), found a significant negative correlation between the frequency of juxtaposed or coordinated utterances (without a subordinate clause) and the rate of morphosyntactic errors. In other words, affected participants who produced structures with no embedding also produced fewer errors. The authors interpret this result to mean that these children have a lower chance of producing an error when there is no clausal embedding, because the processing load has been successfully alleviated and the child has more resources available to produce a target structure.

The frequency of morphosyntactic errors has also been shown to be correlated with argument-structure complexity in elicited production tasks. Pizzioli & Schelstraete (2008) set out to test the hypothesis that some of the problems with grammatical morphemes in SLI stem from processing factors rather than from representational deficits. The authors examined this question via a sentence production task in which argument-structure complexity was varied. Argument-structure complexity has been shown to be a crucial part of sentence complexity, as evidenced by processing studies (see sources cited by Pizzioli & Schelstraete 2008). The participants in their study were 10 French-speaking children with SLI aged 8;1 – 13;0 (*M* = 9;11, *SD* = 1;7) and 20 French-speaking TD children (10 language controls aged 5;6 to 6;4 (*M* = 5;11) and 10 age controls between 9;2 and 11;8 (*M* = 10; *SD* = 1;0)). The production task used in this study targeted the compound past in French (*passé compose*), thus allowing the authors to test for both article and auxiliary omission during sentence production. The results showed that the children with SLI omitted the auxiliary and articles more often than the TD children and that the rate of omission varied as a function of argument complexity. The authors argued that these findings support the hypothesis that processing plays a role in SLI, given that the representation account of SLI does not predict that complexity affects the rate of omission.

3.5 Conclusion

In this chapter, clinical aspects of SLI were presented. In France, children with SLI do not receive an official diagnosis before age 5 or 6, which can make it difficult to find very young children with SLI to include in research. The notion of a clinical marker for SLI in French was discussed and special attention was paid to findings on tense marking, object clitics, and grammatical gender marking in both production and comprehension. Whereas substantial evidence supports tense marking as a clinical marker for languages such as German and English, the case for French is not as clear-cut. It has been proposed that object clitics are a reliable marker for French as well as other Romance languages. The debate on the underlying nature of SLI pits hypotheses which assume that SLI is an impairment caused by deficits in general cognitive processing against those which assume that SLI is caused by problems in domains which are specific to language. However, some proposals suggest that the deficit may be linked to the interaction between these two domains. Jakubowicz, in particular, suggested that deficits arise from limitations in processing components (working memory) that interact with the syntax proper and that are sensitive to the complexity of the derivation. Finally, the study of complex syntax in the spontaneous speech of affected children has allowed for the characterization of impaired versus TD populations as well as the documentation of compensatory strategies which these children adopt to avoid complex syntax. In the following chapter, previous comparisons of children with SLI to L2 children will be reviewed. As we will see, many of these studies have focused on verb morphology, object clitics and gender, while very little work has been done comparing children with SLI and L2 children on complex syntax.

4 Comparing L2 Children to Children with SLI

4.1 Introduction

The first two chapters of this thesis focused on prior work that has examined child second language and language development in children with SLI independently. This review showed that both children with SLI and L2 children have difficulty with verb morphology, object clitics, and grammatical gender. Such research comparing separate studies of these populations has highlighted the similarities in their linguistic performance; however direct comparisons were not performed until Håkansson & Nettelbladt (1993). Since then, direct comparative studies have grown in number and have confirmed that children with SLI and L2 children have consistently similar performance on linguistic tasks. Furthermore, SLI and L2 children differ from age-matched and language-matched TD children in similar ways.

This chapter reviews previous research comparing typically-developing (TD) L2 children and monolingual and bilingual children with SLI (L1-SLI and L2-SLI, respectively). Many of these studies have focused on the same morphosyntactic properties that were highlighted in the first two chapters (verb morphology, object clitics, and grammatical gender). These will be reviewed in Sections 4.2-4.3. Section 4.4 will discuss prior comparative work on the production of syntactic structure in SLI and L2 groups and the role that processing plays in these two learner contexts. Despite the focus on the impact of computational complexity on children with SLI, very few studies have attempted to examine the SLI-L2 comparison using this approach. Results from linguistic and non-linguistic processing tasks will also be presented in this section. At the end of this chapter, I will summarize how factors such as length of exposure (LoE), age of onset (AoO), and chronological age (CA) contributed to the performance of L2 children compared to children with SLI. This will allow me to address the question of whether L2 children with certain characteristics (i.e., limited exposure, younger CA) are more likely to have overlapping performance with children with SLI. In addition, an investigation into the clinical relevance of L1 assessments of L2 children via a parental questionnaire will be presented.

Many studies in this chapter aim to contribute to a better understanding of the similarities and differences between children with SLI and typically-developing (TD) L2 children. The overlap in linguistic performance that has been observed in these two populations creates obstacles in the accurate diagnosis of language impairment in (sequential and simultaneous) bilingual children. TD L2 children are at risk for what is referred to as “mistaken identity” (Cummins 2000, Paradis et al. 2011). This term is used to describe cases in which a TD L2 child is misdiagnosed as language impaired on the basis of his or her performance in the L2, but is in fact acquiring both languages without impairment. On the other hand, bilingual children with SLI run the risk of “missed identity” (Paradis et al. 2011) which occurs when their language problems are attributed to their bilingual acquisition context, when in fact they have language impairment. Given these risks, a major research objective is to better characterize SLI and L2 development so as to better distinguish between a typically-developing and impaired L2 child.

4.2 Verb Morphology

4.2.1 Monolingual SLI and TD L2

4.2.1.1 Håkansson & Nettelbladt (1993, 1996) and Håkansson (2001)

Some of the earliest studies to compare typically-developing (TD) L2 children and children with SLI directly were carried out with impaired Swedish-speaking children and children learning Swedish as an L2 (with various L1s) (Håkansson & Nettelbladt 1993, 1996). Swedish is a V2 language in which subject-verb inversion is obligatory in topicalized declaratives (e.g., in wh-questions and fronted adverbials). Research on TD L1 Swedish children reports that early learners use a variety of word orders, but they display a preference for SVX (Håkansson & Nettelbladt 1993 and sources cited therein). L2 adult learners, on the other hand, have a hard time acquiring the V2 order. Furthermore, it had been previously shown that children with language impairment had difficulties with word order in Swedish. The overall goal of these studies was to compare the acquisition of Swedish in different child acquisition contexts.

Håkansson & Nettelbladt’s preliminary study (1993) analyzed spontaneous languages samples of 6 different children: 1) two L2 children aged 4;0 and 5;5 with L1 Syrian and Romanian, respectively; 2) two monolingual Swedish-speaking children with SLI aged 5;11 and 5;7, respectively; and 3) two TD L1 Swedish-speaking children aged 1;11 and 2;8, respectively. Data were collected once every two months for the L2 and once a year for the

SLI. These samples were then analyzed for the use of V2. The results showed that the children with SLI and the L2ers passed through different stages than the TD L1 before consistently using a V2 order. Young TD L1 displayed varied word order from the earliest recordings and started to use inverted clauses as soon as they produced fronted adverbs. The L2 and the SLI, however, produced fronted adverbs well before they produced inverted structures. Håkansson & Nettelbladt's later (1996) study confirmed these initial findings.

A similar study was carried out by Håkansson (2001) on tense marking and V2 order in ten children with SLI (age range = 4;0 - 6;3; mean = 5;2), ten L2 (age range = 3;6 - 6;0; mean age = 4;10 LoE = 0;4, AoO = at least 3 years old), and ten TD L1 children (age range = 3;1 - 3;7; mean = 3;4). The TD L1 and the SLI were language matched according to results on standardized production and comprehension tests. The L2 group scored well below the TD L1 and SLI on both tests. Their performance on the production test was even below the 2;6-3;0-year-old range. The L2 children were mainly refugees from the former Yugoslavia and the following L1s were represented: Albanian, Arabic and Bosnian. Tense marking data was obtained via an elicitation task in which the child was prompted to comment on a picture by answering the question "What did these children do yesterday?" Tense marking was also elicited via an action test in which the experimenter would place an object in different places and ask the child "What did I do?" (Håkansson 2001, p. 91). For V2 data, short narratives were used to elicit topicalized time adverbials, which require subject-verb inversion. For this task, the experimenter read three short stories to the child and asked the child to retell the stories. The experimenter encouraged the child if needed by saying "What happened then?" or "And…?" Data were collected twice, at 6-month intervals.

At T1, the TD L1 children used V2 significantly more frequently than the SLI and the L2. There was no difference between the SLI and the L2. The TD L1 children did not differ significantly from the other two groups for tense marking. Furthermore, two separate trends distinguished the TD L1 on the one hand and the SLI and L2 on the other. The TD L1 performed significantly better on V2 than tense marking; whereas there was no significant difference for the L2 and SLI. It was noted, however, that the SLI and L2 groups, had a numerically higher rate of accuracy for tense marking (L2 mean = 72%; SLI mean = 74%; L1 mean = 85%) than for V2 (L2 mean = 57%;[46] SLI mean 59%; L1 mean = 98%), which is the

[46] Rates were calculated using the number of V2 orders out of the total number of obligatory contexts.

opposite trend observed in the TD L1 group. The L2 or SLI either produced XSV orders or avoided topicalization by postposing the adverbial.

At T2, the differences across groups had diminished and statistical analyses revealed no significant differences. The L2 improved to a mean 88% accuracy for tense marking and to 71% for V2. The SLI improved to a mean 95% accuracy for tense marking and to 79% for V2. The TD L1 did not improve dramatically due to ceiling effects, but their mean rate for tense marking rose to 97%. Standardized test results at T2 are not reported. The author argues, adopting the Processability Theory (Pienemann 1998a, b), that the different developmental sequence found in the L1 group may be linked to the fact that lexical and grammatical development happens together in this context. In order words, children do not begin using multiword utterances until they have acquired the necessary grammatical structure. The fact the L1 children use subject-verb inversion as soon as they produce topicalized declaratives constitutes evidence supporting this idea. The L2 and SLI, on the other hand, follow a different developmental schedule in which MLU and verb-second are dissociated. The author concludes that the L2 and SLI follow a similar developmental path, which is different from TD L1 development.

4.2.1.2 Paradis & Crago (2000)

One of the earliest direct comparisons of L2 children and children with SLI was conducted by Paradis & Crago (2000). These results led to a series of studies on the L2-SLI comparison based on the (Extended) Optional Infinitive / UCC approach (Wexler 1994, 1998, see section 3.4.2 for an explanation of the UCC) using various language combinations. The Extended Optional Infinitive (EOI) account, which was formulated to explain patterns of optionally using non-finite forms in finite contexts by TD L1 and (for an extended time) by L1-SLI children, predicts a certain cluster of properties will be associated with the (E)OI stage. First of all, the idea behind the (E)OI approach is that problems with tense morphemes characterize young TD and impaired grammars and therefore the (E)OI predicts specific problems with tense morphemes, whereas non-tense morphemes are predicted to be spared. The EOI stage is assumed to be caused by an operative UCC, which restricts the number of checking operations in a given derivation. If the D-element does not check against <tns>, then tense marking will be omitted. This means therefore that omission errors should be much more common than substitution errors. The EOI assumes that syntactic knowledge associated with finiteness is intact and that basic word orders associated with finiteness are generally respected. The idea, as was discussed in previous chapters, is to examine the morphosyntactic properties associated with finite verbs versus root infinitives. The studies that have adopted this approach for the study of L2 - SLI will be reviewed here.

Paradis & Crago (2000) set out to extend the predictions of the EOI to a direct comparison of TD L2 and L1-SLI children in order to describe any differences or similarities between these populations. These authors sought to answer questions concerning the need to adapt the EOI to other acquisition contexts (e.g., L2 children), whether this developmental stage was a problem with the grammatical or conceptual notion of temporal reference, and whether the EOI could be considered a clinical marker of SLI.

In order to answer these questions, the authors compared the use of tense morphemes in the spontaneous language of a group of 15 child L2 learners of French (L1 English) to a group of 10 children with SLI (monolingual French) and to as group 10 TD children (monolingual French). The L2ers were aged 6;7 on average. They had English as their L1 and had first been exposed to French upon entering kindergarten. They had experienced kindergarten and first grade with monolingual French-speaking peers and therefore had two years of exposure. The SLI had a mean age of 7;6 and the TD L1 children were 7;3 on average.

Spontaneous language samples were coded for the morphosyntactic properties associated with finiteness in French, such as root infinitives, tense choice, subject-verb agreement, the use of clitics with finite verbs, and the order of finite verbs with respect to adverbs. Applied to French, the OI account predicts difficulty with tense morphemes, but fewer problems with agreement and syntactic properties associated with tense. Tense choice accuracy rates were calculated using the number of correctly produced tense forms out of obligatory contexts for present, past or future.[47] Subject-verb agreement was evaluated via the third person plural marking on the class of verbs in which this agreement is audible and the first person singular on verbs with suppletive morphology (*être* ‘be’, *avoir* ‘have’, *aller* ‘go’). In addition, lexical subjects and clitics used in subject-doubled constructions were also considered instances of subject-verb agreement. Finally, the use of temporal adverbials was coded, thus providing evidence for the conceptual understanding of temporal reference.

[47] The results for the compound past tense (*passé compose*) were reported here. Past tense forms such as the *imparfait* were rare in the data. For future tense, results for the periphrastic *futur proche* (*aller* ‘go’ + infinitive) were included here. See chapter 5 for full paradigms.

With respect to the use of finite verbs in finite contexts, the TD7 group were significantly more accurate (TD7 mean = 99.5%, *SD* = .43) compared to both the L2 and SLI groups (L2 mean = 89%, *SD* = 4.5; SLI mean = 88%, *SD* = 8.1). In other words, the TD7 produced significantly fewer root infinitives compared to the other groups. Despite this significant difference, the L2 and SLI group nevertheless had high rates of correct finiteness in obligatory contexts. The results for tense choice, however, revealed a slightly different pattern. Concerning tense choice, the L2 used the present tense significantly less accurately than the TD 7 (TD7 mean = 99%; L2 mean = 88%), but there was no difference between the SLI and the control group (SLI mean = 89%). Both the SLI and L2 groups had significantly weaker performance on future (TD7 mean = 99.5%; SLI mean = 64%; L2 mean = 49%) and past tense (TD7 mean = 99%; SLI mean = 74%; L2 mean = 48%) compared to the TD7 group. Furthermore, the L2 scores on future and past tense choice were significantly lower than the SLI. Analyses of within-group comparisons revealed similar patterns between the L2 and SLI for tense choice. Both of these groups were significantly more accurate in their use of present tense compared to the past and to the future, but there were no significant differences between their rates of past and future. In order words, these results indicated that the SLI and L2 learners were overall more accurate with present tense than future and past tense. The non-target forms produced by the SLI and L2 children were either non-finite forms in finite contexts or the present tense in a context in which a past or future tense was expected. A closer look at contexts in which the past or future tenses were obligatory revealed slight differences in the error patterns in these two groups. In these contexts, the SLI had a tendency to overuse non-finite verbs; whereas the L2ers overused the present tense. Furthermore, the non-finite forms produced by the SLI in the context of these compound tenses were past participles with null auxiliaries; whereas the L2 group produced infinitives.[48]

Neither the L2 nor the SLI group exhibited problems with temporal adverbs, in contrast to their apparent difficulty with the grammatical expression of tense. The authors therefore concluded that there was no evidence to suggest that these learners had problems with the concept of temporal reference.

The subject-verb agreement analyses revealed that all three groups were accurate for subject-doubled constructions and first person singular verb forms. In contrast to these patterns, the

[48] Infinitives and past participles are homophonous for the majority of verbs in French; therefore, contexts for this type of analysis were restricted to those classes in which these forms are phonologically distinct.

performance for agreement marking on the 3rd person plural was less accurate (L2 mean = 31%, *SD* = 32.2; SLI mean = 59%, *SD* = 35.8), but the number of obligatory contexts for this type of marking is very rare and therefore these results should be interpreted with caution.

Concerning syntactic properties associated with finiteness, both the L2 and the SLI produced *pas* ‘not’, the adverb of negation, in a targetlike manner (i.e., to the right of finite verb and to the left of infinitives). Furthermore, both learner groups produced subject clitics with finite verbs (L2 mean = 95%; SLI mean = 93.4%)

Although the rate of root infinitives is not very high in the L2 and SLI groups, their main difficulties appear to be with tense marking, which is predicted by the (E)OI. Furthermore, in the French verb paradigm, by far the most frequent present tense form consists of the bare verb stem. Some researchers analyze this form as having no tense features. Therefore, the overuse of the bare stem would be similar to the overuse of a non-finite form in that tense marking is omitted. Moreover, present tense contexts represented the majority of tense contexts in the data compared to contexts for other tenses (L2 mean = 46%; SLI mean = 59%; TD7 mean = 54%). This was argued to explain the strong performance in present tense contexts in both the SLI and the L2 and would explain why the present was often substituted for the past or future tenses.

Other associated syntactic properties were respected, which was taken to indicate that these learners have abstract knowledge of finiteness. Despite inconsistent production of the 3rd person plural, subject-verb agreement appeared intact, judging from instances of lexical and clitic subjects in doubled constructions and first person singular marking on suppletive verbs.

The authors argue that these results support the idea that the (E)OI account can also be used to characterize development in L2 learners, and therefore should be broadened to include this learner context. However, the presence of such properties in child L2 grammars strongly suggests that the maturational component of this account should be reconsidered. Since child L2 learners have already passed through a maturational stage in their L1, they should not pass through the same stage age in their L2. However, the results suggest that L2ers do in fact go through a stage in the L2 in which they encounter similar difficulties with tense and therefore, the idea that maturation is behind such a stage is not supported.

The results from Paradis & Crago (2000) confirmed that L2 and SLI groups have similar difficulties in verb morphology. Given that tense marking has been proposed as a clinical marker of SLI and that there is considerable overlap between the SLI and L2 profiles in this respect, the need to find differences between these two groups became a main research objective. Understanding where TD L2 children and children with SLI differ can lead to more accurate identification of language impairment in bilingual populations.

4.2.1.3 Paradis (2005)

Later studies continued to reveal similarities and some subtle differences between TD L2 children and children with SLI. As discussed above, the risk of inaccurate diagnosis of language impairment stems from the overlap in these populations' linguistic performance on experimental tasks and in spontaneous language, but L2 children also run the risk of inaccurate assessment through the use of standardized tests. The assessment of L2 children using standardized tests originally normed on monolingual populations is considered unreliable, but is nevertheless common practice (Anderson 1996; Klingner & Artiles 2003, cited by Paradis 2005). Because of the scarcity of assessment tools with bilingual norm-referencing populations, very few reliable tools exist for child L2 assessment. As will be shown in the following studies, L2 children, especially those with limited exposure to the L2, can pattern with children with SLI on standardized tests.

Paradis (2005) investigated inflectional morphology from an (E)OI perspective (see Section 4.2.1.3, above) in 24 child learners of English from various L1 backgrounds. The research questions guiding this study were as follows: 1) Do children acquiring English as an L2 pattern like monolingual English-speaking children with SLI? 2) If these groups do pattern alike, could this lead to actual instances of mistaken identity in a clinical context?

The L2 children in this study were aged 4;4 to 7;10 (mean = 5;7), they had first been exposed to English between 3;3-7;5, and had a mean LoE of 9.5 months (range = 0;2-1;6). Tense and non-tense morphemes were examined via spontaneous language samples and an elicited production task based on a standardized assessment (TEGI) designed to test for SLI in English-speaking children. Spontaneous language data were analyzed for the following tense morphemes: third person singular (3sg) *-s*, regular and irregular past tense, BE (copula and auxiliary), and DO (auxiliary). The following non-tense morphemes were also evaluated: progressive aspect marking *-ing*, the prepositions *in* and *on*, articles *the* and *a* and plural *-s*.

Accuracy rates were calculated for each of these morphemes using the number of times the morpheme in question was used correctly out of the number of obligatory contexts for said morpheme. In addition, composite scores for each child were calculated for the tense and non-tense morphemes as an average of the means of the morphemes in each group.

For the elicited production task, the grammatical probes from the Test of Early Grammatical Impairment (TEGI) (Rice & Wexler 2001) were administered. These probes target the third person singular, regular and irregular past tense, BE copula and auxiliary, and DO auxiliary. The production of the third person singular was elicited in the following way: the child is shown pictures of professionals performing a job-related function and the experimenter asks the child about the job the person in the picture does. For example, the experimenter shows the child a picture of a teacher and says, “Here is a teacher. Tell me what a teacher does.” The expected response is, “A teacher teaches.” To elicit the past tense, the child was shown two pictures depicting an on-going action and then completed action. The experimenter said, “Here the girl is skating. Now she is done. Tell me what she did.” The child expected to respond, “She skated.” Finally, to elicit BE and DO, the child is prompted to ask a puppet questions about a set of toys. For example, the experimenter says, “I wonder if the kitty’s resting.” The child is then expected to ask the puppet, “Is the kitty sleeping?”

Although this study did not directly compare a group of L2 children to a group of children with SLI for spontaneous language, the L2 children were compared to the children with SLI that were used to standardize the TEGI. The TEGI was standardized on a group of 393 TD L1 children and 444 children with SLI aged 4-9. Criterion and mean composite scores were discussed in the results. The criterion score corresponds to the lowest cutoff point between the TD and SLI distribution. The mean composite score is a percentage correct score calculated from the mean score from each individual probe. The TEGI provides criterion and mean scores according to age groups (every six months from 4;0-9;0).

Concerning the spontaneous data, the results showed that the mean accuracy rates for the third person singular and regular and irregular past tense in both the elicited and spontaneous data were lower compared to the non-tense morpheme rate. The rates for BE and DO were similar to non-tense morphemes. Moreover, the L2ers produced significantly more omission than substitution (commission) errors. As is usually found in these populations, a large amount of individual variation was observed in the scores. The range in accuracy rates for tense morphemes was between 28% to 82% and 47% to 94% for non-tense morphemes. This variation was not linked to MLU, chronological age, or length of exposure. Although these children have different L1s, the typological differences across these languages did not appear to impact the children's performance on tense morphemes. For the TEGI results, only three of the L2 children scored above the criterion score for their age. The majority of the L2 children scored within the SLI range in terms of mean or criterion scores.

When comparing the scores from spontaneous language and elicited production, the children's performance on the irregular past tense and DO were lower on the TEGI compared to spontaneous. The author hypothesized that this difference was linked to DO being elicited via an interrogative structure, which may add an extra challenge to the task compared to a simple declarative structure. Furthermore, in spontaneous language, the children can stick to using words they know; whereas, in the elicitation task they may be penalized because they have not had enough time learn enough irregular past tense forms.

The author also points out that substantial overlap in the scores of the SLI and L2 children on grammatical morphemes in English highlights the risk that TD L2 children have of being incorrectly identified as being language impaired. These results also confirm the lack of reliability of assessing L2 children using standardized tests which are normed on monolingual populations. These L2 children had rather limited exposure to English at the time of testing, but it is not known how long it should generally take L2 children to obtain higher performance than the SLI. Furthermore, the observed individual variation makes it all the more challenging to establish general language objectives for L2 children based on age or amount of exposure. Therefore, caution should be exercised when assessing L2 children.

4.2.1.4 Marinis & Chondrogianni (2010)

Although this study did not directly compare children with SLI and L2 children, the overall objective was to understand whether L2 children perform like children with SLI on a standardized test used for detecting SLI in English-speaking children. Using an experimental design similar to Paradis (2005), Marinis & Chondrogianni (2010) evaluated tense morphology in L2 children with relatively longer exposure to their L2 (English) compared to Paradis' (2005) group. The study's main research questions were as follows: 1) Do L2 children with longer exposure to their L2 perform within age norms on standardized tests that were normed on monolingual populations; 2) Do L2 children perform like L1 children with respect to tense marking; and 3) Are L2 children sensitive to the phonological properties and frequency of irregular verbs?

Thirty-eight TD L2 children (L1 Turkish, L2 English) and thirty-three age-matched TD L1 English-speaking children participated in this study. The L2 children had a mean age of 7;8 (range: 6;2 – 9;8; *SD* = 1;0), and the L1 children a mean age of 7;4 (range: 6;1 – 8;11; *SD* = 0;8). Most of the L2 children had an age of onset at about 3;0 (mean = 3;4, *SD* = 0;9, range: 1;0 - 5;0). Thirty-one children had an AoO between 2;6 and 3;6, one child had an AoO of 1;0, three children had an AoO of 4;0, and one was 5;0 at the onset of exposure. The L2ers' mean LoE was 4;0 (*SD* = 1;4; range: 1;0 - 6;0).

The child L2ers were evaluated using the TROG2 (Bishop 2003) , which measures comprehension of grammar, the BPVSII (Dunn, Dunn, Whetton, & Burley 1997), which measures vocabulary, and the Test of Early Grammatical Impairment (TEGI) (Rice & Wexler 2001), which evaluates the use of tense morphemes. The TROG2 and BPVSII were normed on TD monolingual populations, while the TEGI was normed on both TD children and children with SLI (see Section 4.2.1.3 above for information on the standardization of the TEGI). Probes evaluating the third person singular (3sg) *-s* and the past tense were administered. Unlike the typical TEGI scoring procedure for past tense items, responses were considered correct only if the expected form was produced. For example, if regular past tense affixation was used in the case of an irregular verb, the item was counted as incorrect.

Results from the TROG and BPVSII revealed that the L2 children performed significantly lower than the L1 on both tests. Within-group comparisons showed that the L2ers scored significantly higher on grammatical comprehension (TROG2) than on vocabulary (BPVSII). A considerable number of children were still at or below -1 *SD* for both tests (TROG2: 17/28; BPVSII: 26/38). When looking at children with a LoE between 1-3 years, more than half (57%) were at or below 1 *SD* from the TROG2 mean and more than two thirds (71%) were at or below 1 *SD* for the BPVSII. In children with a LoE of 4-6 years, approximately one third of them scored at or below 1 *SD* for the TROG2, but more than two thirds scored at or below 1 *SD* for the BPVSII.

Moving on to the TEGI results, the L2 children were significantly less accurate than the L1 children on 3sg *-s*, but there was no difference between groups for the past tense. The production of past tense and *-s* seemed to be influenced by chronological age and LoE. More of the older children scored above criterion scores than younger children. All children younger than 6;11 were below criterion scores for 3sg -*s*, but three out of four were at or above the cutoff for past tense. Sixty percent (9/15) of the L2 children aged 7 or older scored at or above the criterion score for past tense and 3sg -*s*. At age 8, 71% (5/7) of the children performed above the criterion score for 3sg -*s* and 57% (4/7) did so for the past tense. Almost all of the children aged 9 (6/7, 86%) were above criterion scores for both morphemes.

Looking at the distribution according to LoE, under 4;0 years of exposure to English, most of the L2 children scored below the cutoff for 3sg -*s* (13/14), although some (6/14) scored at or above for past tense. From 4;0 LoE and longer, more than half of the children met criterion scores for both morpheme sets. Despite the fact that most of the children with LoE above 4;0 have performances within the TD norm, three out of nine children (33%) with an LoE of 6 years did not meet criterion scores for 3sg -*s* and two out of nine (22%) fell below the criterion score for past tense.

A correlation analyses performed on the other two standardized assessments showed a strong correlation between LoE and the BPVSII raw score (vocabulary), moderate correlations between LoE and 3sg -*s* as well as between LoE and the TROG raw score (grammar comprehension), and a weak correlation between LoE and past tense scores from the TEGI. Overall, the L2ers performed more or less within L1 norms for grammar (TROG2), but not for vocabulary (BPVSII). Beyond an LoE of 4;0, the number of children who were within 1 *SD* of the norm on the TROG increased. However, this was not the case for vocabulary (BVPSII). It appears, therefore, that the L2ers catch up to monolinguals faster for comprehension of grammar than for vocabulary. With respect to the past tense, both the L1 and L2 groups displayed greater accuracy on regular versus irregular verbs, but the difference was greater in the L2 group. The L2ers also seemed sensitive to the frequency of irregular verbs: the less frequent irregulars tended to be subject to overgeneralization.

The authors point out that these performance patterns have important clinical implications for language assessment of L2 children acquiring English. The L2 children were able to perform at age-appropriate monolingual levels much quicker for grammatical comprehension than for vocabulary. The authors also conclude that for most 8- to 9-year-old L2 children, 4 years LoE is sufficient for obtaining scores within norms on English tense morphology as evaluated by the TEGI.

In my opinion, the analysis of the interaction between LoE and chronological age is an important step towards establishing more general expectations about how L2 children can be expected to perform with respect to such factors. However, one can wonder why certain individuals with long exposure did not meet age-expected norms. Are there other factors, such as age of onset, which might explain their low performance?

4.2.1.5 Paradis, Rice, Crago & Marquis (2008)

Accounts from the L2 literature, as well as from the literature on SLI have also influenced the research approach adopted when comparing these two populations directly. For example, Paradis et al. (2008) pitted the predictions from the EOI account against the Missing Surface Inflection Hypothesis (MSIH, see Section 2.2.3) to see which hypothesis would better characterize the profiles observed in SLI and L2 children. The following developmental patterns were to be considered evidence for a MSIH profile over an EOI profile: 1) stronger performance on BE compared to affixal tense morphemes, such as 3sg *-s* or past tense *-ed*; 2) dissociation between performance on comprehension versus production; 3) more form choice (substitution) errors than the TD L1 or L1 SLI.

The participants in this study were 24 TD L2 children (L2 English) aged from 4;2 to 7;10 (mean age = 5;7, *SD* = 0;11) who had been exposed to English for an average of 9.5 months (*SD* = 3.9, range = 2–18 months). The L2ers came from a wide variety of L1s. The L2ers were MLU- and age-matched to a group of 24 monolingual English-speaking children with SLI (L1-SLI) and with a group of 20 TD L1 English-speaking children aged 2;6–3;8 (*M* = 3;0 ; *SD* = 0;4).

As in Paradis (2005, see Section 4.3.1.1), elicited production was obtained via probes from the TEGI (Rice & Wexler 2001) targeting tense morphemes (3sg *-s*, past tense, and BE and DO) as well as the grammaticality judgment task from the same battery. In the grammaticality judgment task, participants were asked to detect ungrammaticality in sentences with tense omission. During administration of the task, the experimenter presents a scenario using two figurines to the child. The experimenter tells the child that the figurines were robots that were just learning English and sometimes made mistakes. The experimenter spoke for the robots using grammatical and ungrammatical (“He running away,” “He want a drink.”) sentences and invited the children to judge whether what the robot said was "right" or "not so good."[49] In addition, spontaneous language samples were used to evaluate tense morphology and instances of overgeneration of BE as reported by Ionin and Wexler (e.g., 2002).

Univariate ANOVAs revealed that the L2 children scored significantly lower on 3sg *-s* and past, but the L2ers performed as well as the other groups on unbound morphemes. However, the results of a multivariate, multilevel regression analyses showed that the L2ers had scores which were similar to the SLI for BE, but the L2ers performed significantly better than the children with SLI for DO. This statistical model also revealed that there was no significant difference between the L2 and the TD L1 for BE or DO. The grammaticality judgment task data indicated a smaller difference in the accurate judgments of bound versus unbound morpheme omission compared to the difference in omission found in production. Furthermore both types of statistical analyses revealed that the L2 and SLI did not differ in their judgment accuracy.

Within group analyses were conducted using the general linear mixed model (GLMM) approach. This analysis revealed that the TD L1 children as well as the SLI were more accurate in producing BE than DO forms, but that there was no difference in their overall accuracy in the production of auxiliaries compared to bound morphemes. Furthermore, the SLI displayed the same pattern in comprehension (i.e., ungrammatical BE forms were not judged more accurately than omitted inflection on lexical verbs). Unlike the monolingual groups, the L2 group produced BE forms more accurately than DO forms and auxiliaries better than bound morphemes. In comprehension, the L2 children were significantly better at judging grammatical BE versus missing inflection on lexical verbs.

The authors concluded from these results that the MSIH better characterizes the developmental patterns displayed by the L2 children because of the dissociation in their acquisition of unbound and bound tense morphemes and in their comprehension versus production performance. These patterns are not attested in L1 acquisition (TD or impaired). These differences between L1 and L2 acquisition may be brought about by a UCC which has matured in the L2 children, but not yet in the L1 groups, assuming that the UCC is still operative in the young TD group and remains operative for a protracted period of time in the

[49] The TD group was too young to participate in the grammaticality judgment task so the SLI and TD L2 groups were compared to each other.

SLI. Therefore, the authors claim that the L2 results do not go against a maturational account for L1/SLI acquisition.

Summarizing the studies from this section, work on French, English and Swedish has revealed overlapping performance in TD L2 children and monolingual children with SLI with respect to V2 properties and tense morphology. Previous studies comparing these two learners on tense morphology reached different conclusions about whether the overlap in performance means that the maturational component of the EOI should be reconsidered. Paradis & Crago (2000) argued that since the L2 children have matured beyond the UCC stage, but nevertheless have difficulties with tense, then the maturation account should be reconsidered for L1 acquisition. However, Paradis et al. (2008) argued that the dissociation observed in the L2 children concerning the acquisition of bound and unbound tense morphemes in English, a pattern that is not observed in typical or impaired L1 acquisition, is better explained by the MSIH and therefore does not go against a maturational account for L1 acquisition. Concerning L2 children with longer LoE, Marinis & Chondrogianni (2010) showed that for many 8- to 9-year-old L2 children, 4 years of exposure to the L2 is sufficient for scoring within TD monolingual norms on tense morphology.

4.2.2 Bilingual SLI and TD L2

An important question motivated by the findings from the comparison of monolingual children with SLI and TD L2 children concerns the profile of bilingual children diagnosed with SLI. Intuitively-speaking, one might easily reason that if TD L2 children have difficulty with certain structures, then a L2-SLI child is going to be doubly disadvantaged. In other words, a L2-SLI child may be completely overwhelmed by the bilingual acquisition task in the context of language impairment, which would result in severe impairments in both languages. A major dilemma confronted by bilingual families of language impaired children concerns the option of raising the child bilingually or restricting the child’s input to one language. If research can show that bilingual children with SLI encounter greater difficulties than monolingual children with SLI, then there would be an argument for restricting the affected child’s language input to include only one language. The following section reviews studies which have compared inflectional morphology abilities across learner groups, including TD L1, TD L2, L1-SLI and sequential and simultaneous bilingual children with SLI. As will be shown, the overall result for L2-SLI children is that they pattern with their L1 peers with SLI and sometimes tend to have slightly higher performance.

4.2.2.1 Paradis, Crago, Genesee & Rice (2003)

One study which showed that L2-SLI children do not experience more severe signs of language impairment was Paradis, Crago, Genesee & Rice (2003). This study investigated the production of tense versus non-tense morphemes in the French and English of simultaneous French-English children. The participants in this study included eight bilingual children with SLI (L2-SLI) whose mean age was 6;11, 21 monolingual English-speaking children with SLI (mean age = 7;1), and 10 monolingual French-speaking children with SLI (mean age = 7;7). Spontaneous language samples were coded in English for the following tense morphemes: BE (auxiliary and copula), third-person singular -*s*, past tense -*ed*, and irregular past tense. For French, the following tense morphemes were analyzed: *être* 'be' auxiliary and copula; *avoir* 'have' as auxiliary; *aller* 'go' as the auxiliary verb in the periphrastic future tense (*futur proche*), and the verb stem.[50] The following non-tense morphemes were evaluated in the English data: progressive -*ing*, prepositions *in* and *on*, and plural –*s*. For French, the following non-tense morphemes were analyzed: definite (masculine: *le*, feminine: *la*, plural *les*) and indefinite determiners (masculine: *un*, feminine: *une*, plural: *des*) and the prepositions *à* 'to' and *de* 'of/from'.

The results showed that the bilingual as well the monolingual groups had similar performance with respect to tense and non-tense morphemes in both languages. All groups had lower scores on the former compared to the latter. This is the type of profile predicted for L1 acquisition by the (Extended) Optional Infinitive approach. The L2-SLI group had difficulties to the same extent as their L1-SLI peers, which suggests that raising children with SLI to be bilingual does not create an added disadvantage for them.

4.2.2.2 Orgassa (2009)

As mentioned in Chapter 3, there is much debate surrounding the adoption of domain-specific and domain-general accounts of SLI. Orgassa (2009) compared the different predictions of these accounts for the development of verb morphology in Dutch by a group of TD L1 children, TD L2 children (L1 Turkish), L1-SLI, L2-SLI and L2 adult learners. Certain domain-specific hypotheses assume that SLI is caused by "missing or deficient knowledge to access the underlying representation of rules (i.e., Universal Grammar) (e.g., Gopnik 1990; Clahsen 1989; Van der Lely 1998)." This approach is referred to as the representational view.

[50] As in Paradis & Crago (2000), other tense types in French, such as the imperfective past (*imparfait*), were not used frequently enough by all the children to be analyzed here.

Orgassa argues that representational deficits of this type “might constrain the availability of one of more principles of UG in SLI” (p. 3). Because of this lack of access to US, children with SLI would have to rely on other learning mechanisms for language acquisition, compared to TD children. A parallel is drawn from this assumed lack of UG availability in SLI to accounts of L2 adult acquisition. For example, the Fundamental Difference Hypothesis (Bley-Vroman 1989) hypothesizes that L2 learners whose acquisition occurs outside of the critical period do not have access to language-specific learning mechanisms and therefore resort to general cognitive mechanisms to acquire the L2. Since both the L2 adult and impaired child are assumed to make use of other learning mechanisms for language development, the representational account predicts that the error types produced in child L1-SLI and child L2-SLI acquisition should be comparable to those produced by adult L2 learners.

On the other hand, domain-general accounts of language impairment assume that SLI is the result of limitations in processing and perceptual capacities which cause a delay in language development. The idea is that a child with SLI needs more time and input in order to derive grammatical rules. This type of account predicts that an L2 child with SLI needs much more time than a L1 child with SLI to acquire each of their languages because their input is reduced (divided between two languages) and therefore less input from each respective language is received. A double-delay is therefore predicted to manifest itself in both languages of L2-SLI children through an increased quantity of errors compared to L2 children and monolingual children with SLI. The representational account predicts that the L1-SLI and L2-SLI groups will produce errors which are similar to those produced by the L2 adult learners. The domain-general account predicts that all child groups will display similar errors that are distinct from those produced by the L2 adults, as well as a greater quantity of errors from the L2-SLI group.

The following children participated in Orgassa’s study: 1) 20 TD L1 children aged 4;0–5;11 (*M* = 4;10, *SD* = 0;7); 2) 25 L1-SLI aged 6;1 – 8;0 (*M* = 7;3, *SD* = 0;8); 3) 20 TD L2 children aged 6;3 – 8;5 (*M* = 7;3; *SD* = 0;7), with an AoO ranging from 1;0 - 4;0, and a mean LoE of 5;3 (*SD* = 1;4, range = 3;4-7;7) at the time of testing; 4) 20 L2-SLI aged 6;0 - 8;3 (*M* = 7;5, *SD* = 0;7), with an AoO ranging from 1;0 - 4;0, and a mean LoE of 5;2 (*SD* = 1;2, range = 3;4-7;7); 5) 9 TD L2 adults aged 22-36 (*M* = 27;11, *SD* = 4;6), with an AoO of no younger than 20 years old, and a mean LoE of 3;2 (*SD* = 3;6, range = 0;10-12;0). The L1 of the L2 groups was Turkish.

The L1 and L2 children SLI were enrolled in schools for children with language impairment and had been diagnosed as language-impaired by speech pathologists. They met the traditional exclusionary criteria for SLI (see Section 3.2.1). The inclusionary criteria included expressive language performance below age expectations (i.e., at least 1.5 and 2 standard deviations below the (Dutch) norm on articulatory and production language subtests). For the L2 children with SLI, admission to the special schools for speech and language impairment was also contingent on having a language deficit in their native language, Turkish. Their L1 was assessed via Turkish vocabulary measurements (Schlichting 2006) and a parental questionnaire (*Anamnese Meertaligheid* 'Intake interview on the child's multilingual situation', Blumenthal and Julien 1999).

A sentence completion task targeting verb inflection and placement were used. The participant was shown two minimally contrasting pictures depicting an action (e.g., in one picture a man is drawing a tree and in another a woman is drawing a sun). The experimenter then began a description of the picture and the participant was asked to complete the sentence (see examples in 24). In order to study verb placement, three word order conditions were tested: SVX, XVS, and SXV. Dutch is a V2 language, so main clause verbs appear in second position, as in the XVS condition (24c) and appear in final position in embedded clauses (24c, SXV condition).

(24)	a.	Experimenter:	De vrouw... 'The woman ...'	(SVX condition)
		Expected response:	tekent een zon	
			'draws a sun'	
		Experimenter:	en de man…	
			'and the man….'	
		Expected response:	tekent een boom	
			'draws a tree'	
	b.	Experimenter	Dat is de vrouw die…	(SXV condition)
			'That's the woman who…'	
		Expected response:	een zon tekent	
			a sun draws	
			'draws a sun'	
		Experimenter:	en dat is de man die…	

		‘ and that’s the man who…’	
	Expected response:	een boom tekent	
		a tree draws	
		‘draws a tree’	
c.	Experimenter:	Hier…	(XVS condition)
		‘here…’	
	Expected response:	teken jij een zon	
		‘you are drawing a sun’	
	Experimenter:	en daar…	
		‘ and there…’	
	Expected response:	tekent hij een boom	
		‘he is drawing a tree’	

An activity description task was used to elicit 1st and 2nd person singular and 1st person plural. In this task, the participant and experimenter performed various actions and that the participant was asked to describe, as in (25).

(25) Ik drink koffie en jij poetst enn schoen
‘I am drinking coffee and you are cleaning a shoe’

The results for verb placement revealed that the L2 adults had particularly poor performance in the inverted XVS and embedded SXV orders. They seemed be applying the SVX template to all conditions. In contrast, all child groups had relatively high performance for verb placement. Crucially, the L2-SLI group patterned with the other child groups and had significantly higher performance than the L2 adults in all conditions. The L2-SLI group had numerically lower performance in the XVS condition (74%), but this was not significantly different from the other groups (> 90%). Three individual L2-SLI children were apparently responsible for this lower mean percentage.

One difference found between the TD L1 children and the other groups was the more frequent use of so-called dummy auxiliaries in V2 contexts by the SLI and L2 child groups. Both the L1-SLI and L2-SLI groups used a significantly lower rate of finite verbs and a significantly higher rate of dummy auxiliaries compared to the TD L1 and L2 groups. The TD L2 children also produced a significantly lower rate of finite verbs and a significantly higher rate of dummy auxiliaries compared to the TD L1. A significant inverse correlation was found between LoE and the use of dummy auxiliaries in the child L2 group and between chronological age and dummy auxiliaries in the monolingual groups. Orgassa argues, following Van Kampen (1997) and Zuckerman (2001), that children avoid V2 orders for reasons of economy. The use of a dummy auxiliary allows the child to avoid moving the finite lexical verb to V2 and is therefore a less computationally costly strategy. Citing Bishop (1994, 2000) Orgassa hypothesizes that such avoidance strategies are linked to limited processing capacities. In the context of a complex task, children with SLI are not able to apply certain rules and as a consequence they prefer less costly strategies or produce ungrammatical forms.

Overall, there was no cumulative effect of L2-SLI in the verb placement results; however, when analyzing error types, the L2-SLI were found to produce a significantly higher rate of root infinitives (*M* = 15.3%, *SD* = 17.2) compared to the other groups, including the L1-SLI (*M* = 5.7%, *SD* = 10).

Although rates of correct inflection are relatively high (mean rate = >75%, L1 and L2 children with SLI have significantly lower accuracy rates than the unimpaired groups. Orgassa's findings therefore contribute to the idea that verb inflection is a marker of SLI in Dutch. The L2-SLI children made significantly more errors than their TD L2 peers, but there was no significant difference L2-SLI and L1-SLI, thus providing evidence against a cumulative effect for the L2-SLI group for inflectional morphology. Overall, all child groups had rather high performance for verb morphology. Like the pattern observed for verb placement, the adult L2 learners had lower accuracy rates than the child groups. Correct finite verb inflection was correlated with length of exposure in the TD L2 group and with chronological age in the TD L1.

Orgassa concludes that the results for verb inflection do not provide evidence for a cumulative effect of L2 and SLI in the L2-SLI group, which does not support the predictions of the processing view. Although this group usually scored lower out of all groups, these differences between the two impaired groups were not statistically significant and the data revealed a considerable amount of individual variation. These results are in contrast to what was found for V2 orders by Håkansson & Nettelbladt (1993, 1996) and Håkansson (2001); however, Orgassa points out that the Swedish learners had had much less exposure to their L2 at the time of testing (less than 2 years versus roughly 5 years for the Dutch learners).

Orgassa also concludes, based on a comparison with the adult L2's performance, that there is no evidence for a representational impairment in SLI. As mentioned earlier, the author assumes that similarities between children with SLI and L2 adults constitute evidence for a deficit in underlying grammatical representations in SLI. This is based on the hypothesis that both children with SLI and L2 adults have impaired underlying representations and therefore should be expected to make similar types of errors. As seen above, there were very few similarities between the child and adult groups. The general conclusion, based on the similarities in error types in the child learner groups, is that the data can best be accounted for in terms of processing abilities.

Although Orgassa's study design was interesting and informative with respect to the comparison across various learner groups, it is not clear to me why deficits in underlying representation in both children with SLI and L2 adults should necessarily result in similar error types or acquisition patterns in both groups. Assuming that these learners must in fact rely on other learning mechanisms for grammatical development, it seems quite probable that the general learning mechanisms available to L2 adults would be quite different from those that are available to the SLI. The differences in cognitive and linguistic (L1) maturity between these two populations could have very well led to (some of) the differences observed for verb morphology.

Instead of concluding in favor of one approach over the other, it might be equally interesting to see where these accounts might overlap. For example, Orgassa refers to Van Kampen (1997) and Zuckerman (2001)'s work on economy principles in TD L1 development as well as Bishop's (1994, 2000) processing limitation idea to explain the use of dummy auxiliaries in all groups except the TD L1. Van Kampen (1997) and Zuckerman (2001)'s work on younger children is, to my knowledge, couched in a domain-specific approach (i.e., they assume that economy principles are part of UG); whereas Bishop (1994, 2000) adopts a general processing approach to SLI. It seems to be that the dummy auxiliary phenomenon was accounted for in an interesting way by integrating both accounts.

4.2.2.3 Armon-Lotem et al. (2007)

In order to better understand how the effects of SLI might be more accurately detected in bilingual children, more qualitative endeavors were undertaken. Armon-Lotem et al. (2007) compared three groups of successive and simultaneous English-Hebrew bilingual children from monolingual or English and Hebrew-speaking homes. The children were divided into three groups based on standardized assessments of Hebrew (Goralnik, 1995) and English (CELF Preschool for English, Wiig et al., 2004). Children who scored above the cutoff of 1 *SD* below the norm on the CELF or above 1.5 *SD* on the Goralnik were considered typically developing (TD). There were 6 children in this group aged 5;5-6;5. Three were simultaneous and three were successive bilinguals. Two of the successive bilinguals had three years exposure to Hebrew and one had two years. Children who scored below the cutoff point on the Hebrew test, but were in the normal range for English, were labeled typically-developing English (E-TD). The E-TD group was comprised of 4 children, aged 4;1 to 6;06 who were all successive bilinguals. Their LoE to Hebrew ranged from 2-4 years. Children who did not obtain scores in the normal range in both languages were referred to as atypically-developing in both languages (A-TD). The A-TD group included 3 successive bilinguals and 2 very early successive bilinguals aged 5;5 to 6;9. Their LoE ranged from 2-4 years. The E-TD and the A-TD groups attended "language preschools"; whereas the TD group attended regular preschools.

These three groups were administered three tests: 1) A sentence completion task which targeted agreement markers in both languages. In English, 3sg -*s* and the past tense were elicited. In Hebrew, the use of gender and number in the third person in past and present tense were evaluated. 2) An elicited imitation task which tested the use of third person singular and plural, present and past tense in English, and person inflections in the past tense in Hebrew. 3) An enactment task (Hebrew only) which elicited person inflections (1^{st} person singular, 2^{nd} person singular feminine and masculine).

The main result from this study is that the A-TD made more errors in both languages compared to the TD group and to the E-TD group for English. The TD group made the fewest errors in both languages. The E-TD and the A-TD group had similar error rates for the Hebrew tasks; whereas the E-TD group performed well in English. All the E-TD children scored significantly higher on the English imitation task and sentence completion task; however, three out four E-TD children had the lowest scores on the Hebrew enactment task and were very weak on the Hebrew sentence completion task. Furthermore, certain errors distinguished the TD bilinguals from the E-TD and the A-TD bilinguals. In Hebrew, agreement errors in gender, number, and person were observed. In English, BE auxiliary in present progressive constructions was omitted and third person verb morphology was used incorrectly with a plural subject as in (26).

(26) The cat hops and the dogs hops.

Concerning the frequency of certain error types, most of the errors made by TD bilinguals in the English task were root infinitives, while most of the errors in the Hebrew task were person agreement errors (16%). Root infinitives were produced by both the TD and the E-TD children in 20% of 3rd person present or past tense contexts in the English task; however, the E-TD children produced a high rate of bare forms in the Hebrew task, an error which was not attested in the TD group in Hebrew. In the English task, the A-TD group produced root infinitives in 50%-60% of obligatory contexts. The A-TD group made errors in person agreement like the TD bilinguals, but at a much higher rate (50-60% of obligatory contexts).

Based on these findings, the authors propose to consider that the children in the E-TD group are slow second language learners and have not yet acquired the inflectional system in their L2. Seeing as the A-TD group had qualitatively similar, but quantitatively higher error rates compared to the other groups, the quantity of errors produced in both languages may be an indicator of SLI in bilingual populations. Given the differences in performance in English between the E-TD and A-TD groups, the authors also advance the idea that differences found in both languages compared to TD bilinguals are a sign of SLI, while differences in only one language are not.

4.2.2.4 Gutiérrez-Clellen et al. (2008)

In a study on Mexican American children in the US, Gutiérrez-Clellen and colleagues set out to investigate the production of tense morphology in (a)typical monolingual and bilingual children. The goals of the study were as follows: 1) To examine whether English finite morphology has the potential to accurately identify language impairment (LI)[51] in Spanish-speaking children who have varying levels of proficiency in English and 2) to study the differences in grammatical performance across different groups of bilingual children. The authors targeted tense morphology in order to compare with previous results showing that English-speaking children with SLI go through an EOI stage and subject production in English in order to observe any potential cross-linguistic influence from Spanish, a pro-drop language. The authors predicted that the bilingual and L2 learners of English would make more grammatical errors than their monolingual peers.

[51] These authors use the term “children with language impairment (LI)” without further explanation, but I assume this to mean that some children had IQs below 85 and therefore were not given the label *specific* language impairment.

The participants in this study were 15 TD L1 English children, 16 TD bilinguals (English dominant), 13 L1 English-speakers with LI (L1-LI), 11 bilinguals with LI (BI-LI) (English dominant), and 16 TD L2 children (Spanish dominant). They ranged in age from 4;5 to 6;5 (mean age = 5;7). Teacher and parental questionnaires were used to place the participants into one of the following language learner groups: 1) L1 English, 2) bilingual English-Spanish speakers, or 3) L2 learners of English with L1 Spanish. Teachers and parents were asked to rate the child’s proficiency and use in each language via a 5-point rating scale (0 = no use or proficiency, 4 = use all the time and nativelike proficiency). Both teachers and parents were asked to estimate the amount of time the child used each language at home and at school.

Results from the questionnaires were used to determine bilingual status. L1 English speakers (L1) were those who had (a) a rating of at least 3 for English use and (b) minimal use and exposure to Spanish. "Bilingual" children had to have (a) a minimum of 20% of time exposed to both English and Spanish; (b) a minimum parent and teacher rating of 3 for English use; and (c) reported spoken Spanish, although with substantial difficulty. L2 learners were those who had (a) a minimum parent rating of 3 for Spanish use and (b) reported spoken English, although with substantial difficulty. Discrepancies between the teacher and parent ratings were resolved by either using the teacher's rating or referring to language test results (Gutiérrez-Clellen et al. 2008, p. 8; see Gutiérrez-Clellen & Kreiter 2003 for more information on the questionnaires).

The children with language impairment were identified using several criteria: 1) evidence of parental or teacher concern; 2) clinical judgment from trained bilingual speech–language pathologists and; 3) scores which fell below the cutoff on Spanish and English morphosyntax subtests of the Bilingual English Spanish Assessment (Peña, Gutiérrez-Clellen, Iglesias, Goldstein, & Bedore 2007). None of the children with language impairment had hearing impairments, mental retardation, emotional disturbance, motor difficulties, or neurological deficits.

Narrative samples in English were elicited using the wordless picture book "Frog, Where are you?" (Mayer 1969) and "One Frog Too Many" (Mayer 1975). Tense morphemes such as BE (copula and auxiliary), DO (auxiliary), 3sg *-s*, and regular past tense *-ed* were coded. Percent correct use of each morpheme was calculated out of the number of obligatory contexts. Grammatical subject suppliance was also calculated.

The results revealed that the TD L1 English speakers had significantly higher performance than the L1-LI (*M* = 90%, *SD* = 8 versus *M* = 44%, *SD* = *23*). The same pattern was found when the TD bilinguals (English dominant) (*M* = 84%, *SD* = *14*) were compared to the BI-LI (English dominant) (*M* = 57%, *SD* = 19). TD L2 English children (Spanish dominant) (*M* = 62%, *SD* = 21*)* were significantly more accurate with tense morphemes than the L1 English children with language impairment, but did not differ from the BI-LI. However, the TD L2 were significantly less accurate compared to the TD L2 English children.

Individual analyses showed 80% (12/15) of the TD L1 English children and 62.5% (10/16) of the TD bilingual children had accuracy rates of 85% or higher. In contrast, no L1-LI reached 85% and only 9% of the BI-LI did. Nineteen percent of the TD L2 children reached this accuracy rate. In contrast, the majority of the children reached 85% for the production of subjects. The only significant difference for subject production was between the TD L1 (*M* = 98%, *SD* = 6) and the L1-LI (*M* = 93%, *SD = 7).*

These findings demonstrate overall success with subject production, but weak performance on tense morphology in English by the children with some Spanish proficiency (bilingual and L2 children). The TD L2, L1-LI, and BI-L1 groups had particular difficulty with BE (copula and auxiliary), DO (auxiliary) and 3sg *-s*; however, the regular past tense *-ed*, as well as the past tense forms of BE and DO were omitted less frequently. The authors explain that this may be due to the use of narratives in which switching from the past to present tense can be considered a grammatical discursive strategy used to engage the listener in the main events of the story. This therefore reduced the number of obligatory contexts for the past tense. The authors argue that the BI-LI children followed the same pattern in finite morphology as the L1-LI, thus providing evidence for the existence of an EOI stage in both groups and against the idea of a "double delay" in bilingual children with LI. The TD L2 was the only learner group who was dominant in Spanish. Their lower performance compared to the TD bilinguals (English dominant) in verb morphology shows that dominance (measured in large part by input quantity, see above) is essential in comparing and interpreting the performance of bilingual and impaired children. Finally, the cross-linguistic influence of pro-drop Spanish on non-pro-drop English was not observable using this methodology. All children supplied grammatical subjects in English at high rates.

4.2.2.5 Paradis (2008)

In another study with BLI-SLI children, Paradis (2008) tested the predictions of the (E)OI account to see if the difficulties in tense morphology constitute a clinical marker for language impairment in L2 acquisition as well as L1 acquisition. If tense morphology is a symptom of SLI in L2 children, then L2 child learners of English with SLI should, according to the predictions of the EOI, 1) have stronger performance with non-tense morphemes compared to tense morphemes; 2) make more errors of omission than substitution; and 3) show overall difficulties with both bound and unbound morphology, without displaying an earlier acquisition of BE compared to tense affixes such as 3sg -*s*.

The methodology adopted in this study was very similar to Paradis et al. 2008 (i.e., elicited production (TEGI) and analysis of tense and non-tense morphemes in spontaneous language, see Section 4.2.1.5 above). The participants included nine TD L2 children acquiring English as their L2 (Mandarin L1) and two L2 children (KVNL and WLLS) who had been identified as having difficulties in their L1 and who had English abilities which were well below age norms. These two L2 children with language difficulties (L2-SLI) had different profiles. KVNL appeared to have a less severe case of impairment and was referred to in the study as being language delayed; whereas, WLLS had a moderate receptive and severe expressive language delay. KVNL and WLLS were 57 and 58 months old respectively at the onset of data collection. KVNL had been exposed to English for 14 months and WLLS for 11. Data were collected three times at 12-month intervals (T1, T2, and T3). The TD L2 group had a mean age of 5;4 and had been exposed to English for 11 months on average.

The TD L2 and L2-SLI children's performance on the TEGI was compared to the mean scores of the TEGI norming population (TD L1 and L1-SLI). KVNL and WLLS performance was compared individually to the TD L2 group scores (mean and standard deviation). The findings at each testing time revealed differences and similarities in the developmental trends between groups. At T1, the TD L2 group as well as KVNS and WLLS had similar performance on the TEGI, which was lower than both the TD L1 and L1-SLI populations from the TEGI norming sample. At T2, the TD L2 group scored lower than the TD L1 (3.8 *SD* below the TD L1 mean), but higher than the L1-SLI and considerably higher than both KVNL and WLLS. Individual TD L2 scores showed that only one TD L2 child scored near KVNL at T2. KVNL and WLLS had similar TEGI scores at T2, which were lower than the L1-SLI. At T3, the TD L2 group was closer to the TD L1 score, but they were still 1.5 *SD* below the TD L1 distribution. In addition, at T3 KVNL caught up to the TD L2 mean score and WLLS caught up to the L1-SLI group. Although KVNL and WLLS's performance diverges at T3, their earlier development parallels that of L1-SLI in the delay of acquisition of tense marking.

A somewhat different pattern emerges from the analysis of tense morphemes in spontaneous language. KVNL and WLLS produced tense morphemes at a rate that fell below 1 *SD* of the TD L2 mean at T1. However, at T2 KVNS scored within 1 *SD* of the TD L2 mean and both KVNS and WLLS are within 1 *SD* at T3. Looking at individual scores, two of the TD L2 children scored -1.5 *SD* below the TD L2 mean at T1, but KVNS was at -2.4 *SD*, which was much lower. Thus, KVNS and WLLS caught up to their TD L2 peer more quickly with respect to tense marking in spontaneous language.

The results for non-tense morphemes revealed that WLLS scored quite low compared to the KVNL and the TD L2ers and at T1 (*SD* = -1.5) and T2 (*SD* = -2.2). No one from the TD L2 group scored as low as WLLS at these testing times and KVNL patterned with the TD L2 group. The difference in accuracy between non-tense and tense morphemes was different between WLLS and KVNL. KVNL was more accurate with non-tense morphemes compared to tense morphemes at T1 and T2, but there was little difference between these types at T3. This pattern was also exhibited by the TD L2 group. WLLS, however, had weaker performance for tense compared to non-tense and all three testing times.

Concerning the acquisition of unbound versus bound tense morphemes, the percentage correct TEGI[52] scores for BE (copula and auxiliary), 3sg *-s*, and past tense *-ed* were analyzed. The findings show that the L2ers (TD & SLI) had higher scores for BE (at T1: TD L2 = 60% correct; KVNL = 70%[53] correct; WLLS = 50% correct) in the earlier testing sessions compared to 3sg *-s* (at T1: TD L2 = 16% correct; KVNL = 25% correct; WLLS = 5% correct) and *-ed* (at T1: TD L2 = 25% correct; KVNL = 0%[54] correct; WLLS = 5% correct). This pattern is not attested in TD or impaired L1 acquisition. At T2, the TD L2ers have somewhat similar performance for bound and unbound tense morphemes; whereas the L2-SLI still exhibit the dissociation between the two. At T3, KVNL performs like the TD L2ers in that he had similar levels of accuracy for *-ed*, 3sg *-s* and BE. However, WLLS continued to perform

[52] The pattern from the spontaneous language data was similar.
[53] Estimated from Figure 4 (Paradis 2008, p. 349)
[54] Estimated from Figure 4 (Paradis 2008, p. 349)

lower on the affixal tense morphemes compared to BE at T3. Error type analyses on the different forms of BE revealed that KVNL and WLLS made primarily omission errors; however, there were overall few errors made by these children with BE by T3.

The author concluded that these findings partially support the predictions of the EOI account, including the notion that tense morphology constitutes a clinical marker of SLI in English. The L2-SLI children were slower than the TD L2 in their development of tense morphology and they were more accurate in non-tense than tense morphemes. However, the fact that the L2ers (TD and SLI) scored low on the non-tense morphemes and acquired BE faster than affixal tense morphemes were patterns not attested in TD L1 or L1-SLI. The author hypothesized that the difference between L2-SLI and L1-SLI could be the result of the later age of onset in the L2 group and hence they had reduced exposure to the target language. This lack of exposure may not allow enough time for the acquisition of non-tense morphemes and therefore the gap between tense and non-tense morphemes might not be as wide in L2-SLI as in L1-SLI. Furthermore, AoO is assumed to be related to linguistic maturity at the onset of acquisition. Children with SLI who are exposed to an L2 during their school-age years could begin their L2 development at the same time that the EUCC begins to fade. Therefore, the EUCC may have a weaker effect on children with later AoO compared to L1-SLI. The author explains that the fading of the EUCC may allow for certain tense-markers, such as BE, to remain unaffected by the checking constraint; whereas other tense morphemes would still be subject to this constraint. It seems to me, however, that if this is the case, then why wouldn't older children with SLI show the same pattern as their tense morphology becomes more target-like?

The author also advances the hypothesis proposed by Ionin & Wexler (2002) which seeks to explain the precocious acquisition of BE in terms of the greater computational complexity involving with checking operations for affixal tenses in English. The idea is that because most English verbs do not overtly move to Tense, affixal morphology is considered to be a case of long distance agreement between the verb and tense projection. This long distance relation is argued to be more marked cross-linguistically and less economical than verbs that move overtly to T, such as BE in English. It is possible that the interaction of the fading EUCC and the sensitivity to the complexity of the affixal tense computation in English is behind the developmental pattern observed in the L2-SLI learners; whereas, this interaction is not the same in L1 children with SLI. It seems to me that, if this is the case, then we should not see the same precocious mastery of BE in languages in which all verbs raise to Tense. To my knowledge, this exact phenomenon has not yet been examined in L2-SLI children acquiring other languages.

As far as clinical implications go, the fact that WLLS caught up to his L1-LSI peers after three years of exposure to English suggests that the acquisition of a second language is not an impossible task for a child with SLI. Furthermore, the L2-SLI children had similar performance on tense morphology compared to the TD L2 at T1 and only performed differently in later stages (T2). The distinction between 3sg *-s*, past tense *-ed* and BE is also important for differential diagnosis. The L2-SLI performed (almost) as well as the TD L2 at T2 for BE; whereas they lagged behind dramatically for *-s* and *-ed* at T2 and somewhat at T3.

Although this study makes very interesting points about possible differences between L2-SLI and TD L2 children on the one hand and between L1-SLI and L2-SLI on the other, it seems to me that more attention should be given to the individual variation that is certainly present in the performance of the TD L2 children. Although it is pointed out that most, if not all, individual TD L2 children do not score as low as either of the L2-SLI children, it is possible that individual TD L2 children could display a pattern similar to the L2-SLI children. If the idea is that a possible indicator of SLI in an L2 child is the longer exposure needed to master tense morphology, then a stronger argument would be to explain how many of TD L2 children were above a certain accuracy rate by T2 or T3.

Summarizing, this section reviewed results related to the comparison between TD L2 and children with SLI (monolingual and bilingual) on tense morphemes. As explained in Chapter 3 (Section 3.3.1), tense morphology is considered a clinical marker of SLI, although the severity of problems in this domain varies according to the language. The studies in this section addressed the overlap in performance on tense morphemes by monolingual SLI and TD L2 children acquiring Spanish, English, French, Hebrew and Dutch. These two learner groups displayed considerable overlap in each of these three languages; however, L2 and SLI learners of English appeared to have lower accuracy rates in inflectional morphology than Dutch and to some extent French. In French, although the TD L2 and L1-SLI did not produce a high rate of compound future and past tenses, both the TD L2 and L1-SLI produced finite verbs in obligatory contexts at a relatively high rate. Analyses from Dutch revealed significant differences across learner groups, but all groups had fairly high rates for verb morphology. In contrast, the suppliance of English affixal tense morphemes was very low for TD L2, L1-SLI and L2-SLI children from diverse L1 backgrounds. Work on Hebrew speakers revealed the importance of studying both languages and work on Spanish speakers demonstrated the effect that dominance (measured by input factors) can have on linguistic performance.

The results reported on here for verb morphology in French and English revealed a considerable overlap between TD L2 children and children with SLI. In the only longitudinal study of this section, Paradis' (2008) TD L2 group scored 1.5 *SD* below the TD L1 TEGI mean for tense morphemes after three years of exposure to English. Although individual TD-L2 scores are not presented with these results, group means seem to suggest that TD L2 children need at least three years of exposure to the L2 before closing in on the TD L1 norms. Marinis and Chondrogianni (2010) also used the TEGI on TD L2 children acquiring English, but their participants had much longer exposure. Their conclusion was that 8-9-year-old children need at least four years exposure before converging on the TD L1 distribution for the production of tense morphology. In light of these results, TD L2 learners of English with less than 3-4 years exposure could be inaccurately identified as being impaired if performance on tense morphemes is considered as a marker of SLI. Given that the severity in difficulties with inflectional morphology varies by language, the LoE necessary for TD L2ers to attain age-appropriate performance should be expected to vary by language as well.

The performance of the L2-SLI children was not "doubly" weaker than the L1-SLI in the studies discussed here, which provides counterevidence to the predictions of the domain-general hypotheses. According to these accounts, bilingual children should be even more delayed than their impaired monolingual peers because more time would be needed to process input from two languages. These results also suggest that bilingual children with SLI are not disadvantaged further by their bilingual acquisition context; and therefore, there is no reason to counsel bilingual families to raise a child with SLI in a monolingual setting. The following section continues to explore the predictions of both accounts of SLI through the examination of the acquisition of object clitics.

Finally, the results of the studies presented in this section revealed some subtle differences between L2 children and children with SLI, in addition to confirming that many similarities exist. The precocious acquisition of BE in TD L2 English, which had been observed in earlier studies on child L2 acquisition (Ionin & Wexler 2002, Chapter 2), appears to be absent in typical and impaired L1 acquisition. Furthermore, the difference between the accuracy rates on non-tense versus tense morphemes in English is larger in monolingual compared to bilingual acquisition.

4.3 Object Clitics

This section presents research which compares typical and impaired acquisition (monolingual and bilingual) of object clitics in French. As mentioned previously, French has a series of accusative clitics (*me, te, le/la, nous, vous, les*; see Chapter 5 for full paradigms) which have also been shown to cause problems for learners acquiring French in non-optimal context (e.g., Tuller et al. 2011). The comparative study of object clitics across various L1 and L2 learner groups has been used to examine the question of the source of difficulties associated with object clitics in L2 acquisition (developmental or transfer issue), as well as how best to characterize the nature of the impairment in SLI (general cognitive processing issue versus a problem associated specifically with the linguistic module). As seen in Chapter 3, object clitics are considered a potential clinical marker of SLI in French. As with other potential markers such as verb morphology, there is considerable overlap between the SLI and L2 profiles in terms of their rate of production of object clitics. However, object clitics also allow for the analysis of potentially different patterns in development between impaired and typically-developing populations. The goal of this section is to review the literature on the acquisition of object clitics by impaired and TD L2 learners compared to TD L1 and L1-SLI French-speaking children and to discuss the overlap in the learner profiles and highlight any potential differences which could lead to a better understanding of the differences between TD L2 and impaired L2 acquisition of French.

4.3.1 Monolingual SLI and TD L2

4.3.1.1 Paradis (2004)

Paradis (2004, see also Paradis & Crago 2003) compared TD L2 children (L1 English, L2 French) with monolingual French-speaking children with SLI with respect to their production of accusative clitics. The author points out that comparing L1-SLI and L2 patterns can help determine whether non-target structures produced by L2 children are the result of L1 transfer or of a grammar in development. If L2 and SLI errors are similar, then this argues against the idea that L1 transfer is the source of non-target object clitic productions in L2 development because this would not explain the errors made by the SLI. The L2 acquisition of object pronouns in French by L1 English-speakers provides an interesting testing ground for the influence of L1 transfer. The English and French pronominal systems have some similarities, but differ in important ways. As mentioned in Chapters 2 and 3 (and as explained in detail in Chapter 5), French has a series of accusative and dative clitics which have different distributional properties than lexical DPs (e.g., they do not appear in canonical object position), as well as a series of strong pronouns that distribute like lexical DPs. Strong pronouns in French have distributional properties which are similar to object pronouns in English, but none of the English object pronouns behave like object clitics in French. Based on these differences between the two languages, the authors predicted that L1 transfer from English into French would manifest itself in as demonstrated in (27a-c).

(27) a. *Brigitte regarde la.
Brigitte looks-at ACC:FEM:SG
'Brigitte is looking at it'

b. *Brigitte regarde elle.
Brigitte looks-at StrPro:FEM:SG
'Brigitte is looking at her'

c. Brigitte regarde ça.
Brigitte looks-at StrPro:SG
'Brigitte is looking at that' (Paradis 2004)

The types of errors in (a) and (b) have been attested, albeit in very small numbers, in L2 child spontaneous language data. L1 French-speaking children do not obtain ceiling performance for object clitics until around 5-6 years old, but placement errors such as (a) and (b) have not been observed in atypical or typical L1 child production data (Zesiger et al. 2011; Hamann et al. 1996). Recall from Chapter 3 that L1 TD and impaired children generally omit clitics in spontaneous language or use pragmatically odd lexical DPs in elicited production before fully acquiring the object clitic system (see Section 3.3.2).

In order to evaluate object clitic production in French, spontaneous language samples were collected from the following groups of children: 7-year-old TD, L1 French-speakers (TD7) (mean age = 7;3, mean MLUW = 5.70, *SD = 0.83*), 7-year-old L1 French-speakers with SLI (SLI) (mean age = 7;6, mean MLUW = 3.98, *SD* = 0.44), 7-year-old L1 English speakers acquiring French as an L2 (L2) (mean age = 6;8, mean MLUW = 4.09, *SD = 0.47*), and 3-year-old TD L1 French-speakers (TD3) (mean age = 3;3, mean MLUW = 3.67, *SD = 0.80*).

There were ten children in each group. The L2ers were attending French-language schools in Montreal in which the large majority of their classmates were native French speakers. The L2ers had first been exposed to French in kindergarten and were tested at the end of Grade 1; therefore, they had two years of exposure to French at the time of data collection.

The production rate of object clitics in spontaneous language samples was calculated out of all possible pronominalization contexts. Contexts were considered possible for pronominalization when "the referent acting as the direct object of a transitive verb was previously mentioned in near discourse on the same topic (within 5–10 preceding lines of the transcript)" (Paradis 2004, p. 75). The type of object was then coded (clitic, strong pronoun, lexical object, or null object). Morphological errors such as gender, person and other (wrong clitic) were also coded.

The results showed that both the SLI and L2 groups provided object clitics significantly less frequently then the TD7 and TD3. The TD3 mean rates were quite high and the TD7 almost always produced a clitic when expected (TD7: *M* = 97.63%, *SD* = 2.9; TD3: *M* = 85.56% *SD* = 9.9). In contrast, the L2 and the SLI only produced clitics roughly half of the time with very high individual variation (L2: *M* = 41.48%, *SD* = 20.8; SLI: *M* = 47.3%, *SD* = 14.7). There were no significant differences between the L2 and SLI groups. An error analysis was performed to see what was produced in the place of an object clitic. The first result from this analysis was that omission was the most frequent error type. The second most frequent error type was the use of lexical DPs by the TD3, and of strong pronouns by the L2ers. The SLI overwhelmingly used omission in clitic contexts. Overall, these results suggest that the L2 and SLI supply object clitics at a similar rate, but differ in terms of the type of errors they make when an object clitic is expected. The author concludes that these results argue against L1 transfer as the source of object clitic errors in L2 child acquisition of French, given that the L2ers do not differ starkly in their error patterns from the other groups that do not have English as a possible influence.

4.3.1.2 Hamann & Belletti (2008)

Hamann & Belletti (2008) compared the production of object clitics in the longitudinal spontaneous language data of L1, SLI and L2 children reported on in the literature, in addition to comparing their data on object clitics from Elisa (L1 German) and Lorenzo (L1 Italian) (see Section 2.3.2.2). Elisa and Lorenzo's production of object clitics was compared to eleven monolingual French-speaking children with SLI. Elisa was aged 4;0 – 5;5 during the span of data collection and Lorenzo was 3;5 – 4;10 . At the onset of the recordings, Elisa had been exposed to French for 13 months and Lorenzo for 14 months. Elisa's AoO was 2;8 and Lorenzo's was 2;4. Like Paradis (2004), Hamann & Belletti's principal research objective concerned teasing apart L1 transfer and developmental effects on the L2 acquisition of French object clitics.

General trends in object clitic omission revealed different patterns between the TD monolingual, TD bilingual (Lorenzo) and early L2er[55] (Elisa) on the one hand, and L1 SLI on the other. The former show a sudden "spurt" in the use of object clitics, whereas the latter display a pattern of stagnation in their rates of suppliance. Nevertheless, citing results from Paradis (2004, see above) the TD L2 and children with SLI display some overlap with respect to object clitics production at some stage of development. Concerning object clitic errors, child L2 learners show placement error patterns, which are rare,[56] but which are absent in monolingual populations (as in (8) from Section 2.3.2.2, repeated here in (28)). Placement errors in simultaneous bilinguals are also rare. Lorenzo did not produce any, even in so-called restructuring contexts in which the placement of the object clitics differs between French and Italian. Crysmann and Müller (2000) did not observe placement errors either for the two French/German simultaneous bilinguals they studied. However, placement errors were also observed in the French/Dutch simultaneous bilingual, Anouk, who was studied by Hulk (2000) (see Section 2.3.3.4). Hamann & Belletti report that ten percent of Anouk's object clitics were placed in non-target positions.

(28) non, on laisse le
no one leaves cl.ACC (Elisa, 2nd recording)

Elisa also used lexical DPs, like the TD3 group from Paradis (2004, see above). The review of relevant data presented in this study revealed perhaps subtle differences in TD L2 children and children with SLI. Whereas the L2 children may place object clitics in postverbal position, these learners demonstrate a "spurt" in their development of object clitics, like TD L1 children. Children with SLI, on the other hand, do not place object clitics postverbally and they do not exhibit the same "spurt" as the unimpaired learners.

[55] See section 2.3.1.2.2 for the reasoning behind the different labels given to these children.
[56] Recall from section 2.3.2.2 that Elisa's first four object clitics were placed incorrectly.

4.3.1.3 Grüter (2005)

In addition to better understanding the nature of error patterns often observed in L2 acquisition as well as the underlying nature of SLI, comparative studies including SLI and L2 children have also been used to test the predictions of accounts which propose characterizations of developing L2 grammars.

As explained in Chapter 2, the most frequently cited hypotheses in the L2 literature fall into two general camps: 1) those which posit that patterns observed in L2 acquisition are the result of impaired grammatical representations (citations); and 2) those which assume that these patterns are the result of problems with the mapping morphological forms to (intact) syntactic representations (citations). As Grüter (2005) points out, parallels exist between the domain-specific and domain-general hypotheses formulated for the SLI context and the representational and mapping accounts for the L2 context.

The main objective of Grüter's (2005) study was to test the claim that both L2 and SLI have impaired linguistic representations against the approaches which assume intact representations. To do so, Grüter administered a production and comprehension task targeting object clitics in French to a group of children with SLI and TD L2 children. Assuming comprehension and production depend on the same grammatical system, stronger scores in comprehension compared to production would constitute evidence against the idea that underlying representations are impaired. This argument was also made by Jakubowicz et al. (1998) in earlier work on comprehension-production asymmetries.

The participants in this study included a group of 7 English-speaking L2 children (mean age = 6;8, range = 6;5 – 7;1), 6 L1 French-speaking children with SLI (mean age = 8;2, range = 6;6 – 9;2), and 12 L1 TD French-speakers (mean age = 6;7, range = 6;2 – 7;1). The production of accusative clitics in French was elicited via a picture story which was presented to the child by the experimenter. The story was interspersed with questions for the child thus creating a context in which a response including a direct object pronoun was pragmatically the most felicitous (see (29)).

(29)	Experimenter:	Tu penses qu’il y a quoi dans la tasse de maman?
		‘What do you think is in the mother’s cup?’
	Expected response:	du café/ du jus
		‘coffee/ juice’

Experimenter:	Et qu’est-ce que la maman fait avec le café/ le jus?
	‘And what is the mother doing with the coffee/ juice?’
Expected response:	Elle le boit.
	‘She is drinking it’

Sentences pairs were created using optionally transitive verbs that differed by the presence or absence of a direct object clitic or DP. The experimenter told a picture story to the child and said that the final picture was missing from the story. At the end of the story, the test sentence was read and the child was asked to complete the picture story by choosing the picture which matched the test sentence. The child was presented three pictures to choose from. One of the pictures depicted the transitive reading of the verb, another the intransitive reading and the third was a copy of the preceding picture in the story. The stories were written so that both the intransitive and transitive readings were plausible endings to the story.

Group results for production showed that the L2 and the SLI supplied clitics at a significantly lower rate than the TDs in production. Although the L2ers had a numerically higher mean score (*M* = 24%) than the SLI (*M* = 8%), the difference was not significant. Group results for comprehension demonstrated that both the L2 and the SLI were quite accurate in comprehension (SLI mean = 83%; L2 mean = 79%). The difference between the two groups was not significant for the comprehension task either. Crucially, group means showed that the mean rate of transitive (correct) responses in the clitic condition were significantly higher than the intransitive responses. Intransitive (correct) responses in the intransitive condition were also significantly higher than the transitive responses. This result indicates that both groups were able to distinguish sentences that differ minimally by the presence or absence of an accusative clitic.

However, Grüter's individual results analysis revealed two different patterns in the L2 group. There was a group of children who had very low performance in both comprehension and production. This L2 subgroup produced no clitics and had comprehension scores which were at chance (<12/16) which corresponded to a greater than 5% probability of guessing). A second L2 subgroup (*N* = 3) produced several accusative clitics (6, 3, 10, out of 12, respectively) and performed well in comprehension (≥12/16). Based on this division of individual results, the author concludes that the L2 group divides into those who can respond accurately in comprehension and production and those who can do neither. In contrast to the L2 group, the individual results of the SLI group do not display the same pattern. Three of the

SLI children had high comprehension scores (>12/16), but produced no clitics. Two children with SLI produced no clitics and had chance level performance in comprehension, like one of the L2 subgroups. The remaining child with SLI had relatively good performance in production (4 clitics produced) and above chance performance in comprehension (15/16) and therefore patterned like the L2 subgroup with stronger performance in both tasks.

The author argues that the L2 children with poor performance in both modalities are in initial stages of acquisition (LoE) and have transferred the setting for object pronouns from the L1, which cannot accommodate object clitic production or comprehension in French. However, Grüter goes on to say that this is not a permanent characteristic of their L2 grammars, as evidenced by the high performance of the other L2 subgroup, who have arguably moved beyond the initial stages of acquisition. Although a representational impairment could explain the poorly performing L2ers, it cannot explain the better abilities of the other L2 subgroup on object clitics. Concerning the SLI, the author considers the results inconclusive with respect to the predictions of the representational impairment account, which may be due in part to the individual variation found within groups of children with SLI.

Summarizing, Paradis (2004), Hamann & Belletti (2008) and Grüter (2005) described both differences and similarities in their studies comparing TD L2 children and L1-SLI on object clitics in French. Paradis described slight differences in error types: The L2 used strong pronouns in clitic contexts more often than the SLI. Hamann & Belletti described that the TD L2 children have a “spurt” in their production of object clitics, whereas the L1-SLI do not. Grüter describes differences in the dissociation between production and comprehension of object clitics: TD L2 children either perform well in comprehension and production or perform weak in both. On the other hand, some children with SLI had strong scores in comprehension, but weak scores in production. Besides these subtle differences, these three studies also observed that both learner group overlap for object clitic omission.

4.3.2 Simultaneous Bilingual and Monolingual SLI

4.3.2.1 Paradis, Crago & Genesee (2003)

Paradis et al. (2003) set out to answer the following research question: Given the difficulties with object clitics in French which have been documented in the literature, what particular aspect of object clitics (in particular, accusative clitics) poses the greatest challenge for children with SLI acquiring French? If these patterns are due to problems with anaphoric reference then bilingual children with SLI should have problems with object pronouns in both English and French. As was discussed earlier, English does not have object clitics like French. However, if the bilingual children only have difficulties in French, this would suggest that the morphosyntactic properties of object clitics are pose the greatest challenge to learners.

The participants in this study included 7 French-English simultaneous bilingual seven-year-olds with SLI (BI-SLI) and 9 French-English simultaneous bilingual typically-developing 3-year-olds (TDBI3) (MLUW matched in both languages). The BI-SLI were aged 7;3 on average and had a mean French MLUW of 3.557 and an English MLUw of 3.856. The TD bilinguals were 3;3 on average and had a mean French MLUW of 3.706 and had a mean English MLUW of 3.493.

Spontaneous language samples were collected in both languages and were coded for the number of possible contexts in which an accusative clitic was permissible (i.e., the referent was previously mentioned in near discourse) and for what was actually supplied in those contexts. For the French samples, clitics, strong pronoun, null object and lexical DPs were coded. Grammatical object types included accusative clitics and the demonstrative *ça* ‘that’. For English, null object, personal pronouns, demonstratives and lexical DPs were counted. Grammatical object types included personal and demonstrative pronouns. Production rates of overall object pronouns, of grammatical and ungrammatical types and of target morphological form (agreement in gender, number, and person) were calculated over the number of possible direct object pronoun contexts. The bilingual children acquired both languages from birth and had parents who were native speakers of each language. The bilingual children with SLI were part of the caseloads of speech-language pathologists. The typical exclusionary criteria were applied (normal hearing, no severe phonological disorder, no frank neurological problem and normal non-verbal IQ). In addition, the SLI had to have a verbal IQ score 1.5 *SD* below the age-expected norm and to score 1 *SD* below age-expected norms on a majority of subtests in a standardized language battery in both languages.

Within-group analyses showed that both groups produced a significantly higher rate of grammatical object pronoun types in English (TDBI3 mean rate = 96%; BI-SLI mean rate = 97%) than in French (TDBI3 mean rate = 78%; BI-SLI mean rate = 74%). Grammatical object pronouns included *ça* and clitics for French and personal and demonstrative pronouns for English. The difference in the rate of grammatical object types between the two groups was not significant. Furthermore, both bilingual groups omitted objects in French (TDBI3 mean rate = 12%; BI-SLI mean rate = 19%), but very rarely in English (both groups had mean omission rates in English under 5%). In other words, BI-SLI 7-year-olds used grammatical object types at the same rate as the TD bilingual 3-year-olds in both languages, but both groups produced fewer grammatical object types in French compared to English. When analyzing whether pronouns were well-formed with respect to person, number or gender, the TD bilinguals produced objects with correct morphological form at the same rate as the BI-SLI in both languages (For French: TDBI3 mean accuracy rate = 86%, BI-SLI mean accuracy rate = 82%; For English: TDBI3 mean accuracy rate = 100%, BI-SLI mean accuracy rate = 96%). Within-group comparisons showed that the TD bilinguals produced correct object pronouns significantly more often in English than in French. This difference tended towards significance in the bilingual SLI group, but did not reach it. Although statistical significance was not reached for the difference between English and French for the SLI, results for both groups suggest that when pronouns were produced, they corresponded to the target morphological form (agreement in number, person and gender) more often in English than in French. Overall, the production of object pronouns in both languages is different. These groups of children have more difficulty with object clitics in French compared to object pronouns in English. The strong performance in English indicates that anaphoric reference does not pose particular problems, but that the morphosyntactic properties of French object clitics create stumbling blocks for these children.

The rate of object clitic production in French was also compared to two groups of 10 TD L1 French-speaking children (7- and 3-year-olds) and a group of L1 French-speaking children with SLI (L1-SLI: mean age = 7;6; mean MLUW = 3.98) to evaluate the effects of bilingualism and language impairment. The TD 7-year-olds (TD7) had a mean MLUW of 5.70 and the TD 3-year-olds (TD3) had a mean MLUW of 3.67). The L1 TD7 children performed at ceiling for the suppliance of object clitics, followed by the L1 TD3 and the TD bilingual 3-year-olds who were both above 75%. The BI-SLI was not too far behind the TD bilingual 3-year-olds at 70%, but the L1-SLI group had the lowest mean rate of object clitic use (47%). The authors argue that this distribution shows that the bilingual children with SLI are not slowed down by their bilingual acquisition compared to their age-matched monolingual peers with SLI. Furthermore, both the bilingual and monolingual children with SLI perform lower than their TD language-matched groups (TD 3-year-old bilinguals and monolinguals), which indicates that object clitics in French are a good candidate for a clinical marker of SLI (Rice & Wexler 1996).

4.3.2.2 Paradis et al. (2005/2006)

In a follow-up to Paradis et al. (2003), using the same populations and methodology, Paradis et al. (2005/2006) applied the predictions of domain-general and domain-specific hypotheses to the context of bilingual SLI. Continuing with a comparative approach of the study of object clitics in French, Paradis et al. (2005/2006) tested the predictions of domain-general and domain-specific approaches to bilingual SLI. As was previously mentioned, comparing the performance of L1-SLI and L2-SLI groups provides a testing ground for domain-specific versus domain-general hypotheses. According to domain-general hypotheses, L2-SLI children are predicted to be more delayed than L1-SLI because input is reduced in each language in the bilingual context; whereas the domain-specific approaches do not make this prediction. Furthermore, the study of the development of object clitics in French by these groups can enhance this testing ground by addressing another prediction that differs in the two approaches. As discussed in Chapter 3, domain-general accounts of SLI such as the Surface Hypothesis (SH) (Leonard 1998) predict that morphemes with non-salient phonetic properties will require more input to be acquired; whereas domain-specific accounts claim that the linguistic nature of certain structures cause problems for learners with SLI. Object clitics in French form a phonological unit with the verb they cliticize to and therefore cannot receive contrastive stress. These elements are also of short duration and the vowel is elided in front of a verb with an initial vowel. Object clitics are homophonous with the definite article, and therefore, the SH would predict difficulties with both constructions. However, domain-specific approaches predict that object clitics will be acquired late because of their particular morphosyntactic properties (see Chapter 5) and these accounts do not predict difficulty with definite articles. Neither of the accounts predicts difficulty with object pronouns in English.

The predictions of the Surface Hypothesis were tested for the acquisition of accusative clitics and the definite article in monolingual French-speaking children with SLI and young TD L1 children by Jakubowicz et al. (1998). These results showed that, despite the similar phonetic properties of the definite article and object clitics, both TD L1 children and children with SLI performed very well on articles, but significantly lower on object clitics. In the current study under review, Paradis et al. (2005/2006) followed up on the previous comparison (Paradis et al. 2003) of five different learner groups. Bilingual (English-French) children with and without SLI were compared to language- and age-matched TD monolingual (L1) French-speaking and bilingual (English-French) children. The impaired groups, whose characteristics are repeated here, included nine bilingual children with SLI with a mean age of 7;3, ten monolingual French-speaking with SLI aged 7;7. The TD groups included a group of 3-year-old bilinguals (TDBI3) and monolinguals (TD3), each with a mean age of 3;3, as well as a group of TD L1 children aged 7;3. All groups had MLUWs around 3.5, except the TD7, who had a mean MLUW of 5.70 (see previous section for exact figures).

The bilingual children’s production of object pronouns was analyzed via English and French spontaneous language samples. Recall from Paradis et al. (2003) that the TD bilinguals and the bilinguals with SLI produced a significantly higher rate of object pronouns in English compared to object clitics in French. No significant inter-group differences were found between the TD bilinguals and the bilinguals with SLI with respect to the rate of suppliance of object clitics in French or the rate of object pronouns in English.

In the follow-up study, further comparisons on the mean rate of object clitic use showed that the BI-SLI group (70.6%) performed significantly higher than the L1-SLI (47.3%), but did not differ significantly from the L1 TD3 (85.6%). Both groups with SLI performed significantly lower than the TD7 (97.6%). In addition, the TDBI3 (77.14%) performed like their L1 TD3 peers. All groups performed at > 90% for the definite article.

When analyzing what was produced instead of an object clitic in the relevant contexts in French, the bilingual (TD and SLI) and monolingual (TD and SLI) children were found to have used object clitic omission most frequently. However, the bilingual children tended to use strong pronouns; whereas the monolingual children tended to use more lexical objects. These groups were also compared on their rate of supplying the correct morphological form of the clitic. As reported in Paradis et al. (2003), there were no inter-group differences between the TDBI3 and BI-SLI groups for this measure in either language, but both groups were generally more accurate with English object pronouns than French clitics. Follow-up analyses revealed that the L1-SLI had a significantly lower rate of well-formed clitics (M = 70.5%) than the L1 TD3 group (M = 81.6%). There were also no significant differences in accuracy rates when comparing the TD age-matched bilinguals (TDBI3) to the monolinguals (TD3) and the SLI age-matched bilinguals (BI-SLI) to monolinguals (L1-SLI).

These results add to the evidence against the existence of a "double delay" in bilingual children with SLI compared to monolingual children. In fact, the bilinguals with SLI often had numerically higher scores than the monolinguals with SLI. Furthermore, the BI-SLI performed like language-matched TD bilingual 3-year-olds; whereas the monolinguals with

SLI performed weaker than their language-matched L1 controls. The absence of cumulative effects in the context of bilingualism and language impairment does not support the domain-general prediction that reduced linguistic input available to bilingual children with SLI should result in language that is even more delayed than monolingual children with SLI. However, the authors point out issues with domain-specific predictions as well. The (E)UCC, an approach which assumes developmental limitations in the computational system, predicts difficulty with both tense morphemes and object clitics (see Section 3.4.2), but the monolingual and bilingual children with SLI had considerably more trouble with object clitics compared to tense morphemes in French. For example, the BI-SLI and the L1-SLI children produced the past tense auxiliary in 80.2% and 82.8% of obligatory contexts, respectively (Paradis et al. 2003, see Section 4.2.2.1), but they only produced clitics in 70.6% and 47.3% in permissible contexts, respectively. The (E)UCC does not account for this type of asymmetry in degree of difficulty of structures it predicts to be vulnerable. The authors conclude that future research should integrate ideas from both the perceptual limitation accounts and the linguistic domain accounts.

In summary, the studies carried out so far on the direct comparison between SLI and L2ers on object clitics in French have revealed some differences, but many similarities between the two learner groups. Difficulties with object clitics are considered to be a clinical marker of SLI in French; therefore, similarities between the SLI and L2 profiles increase the risk of misdiagnosis of language impairment in French-speaking L2 children. Most of the L2 children studied here had two years or less exposure to French. It will be interesting to compare L2 children with more exposure to see whether the similarities for object clitics are stable over time.

Furthermore, even if object clitics have been shown to create obstacles for all learners of French, L2 children with SLI perform as well as their monolingual peers, and sometimes even better. For example, the BI-SLI group from Paradis et al. (2005/2006) supplied object clitics significantly more frequently than the L1-SLI (70.6% versus 47.3%). This finding would suggest that BI-SLI children are in fact assisted in their development by their bilingual context. It is possible that bilingualism could mitigate the effects of SLI either through enhancing certain execute functions or creating a situation in which one language “bootstraps the other” (Paradis 2010, p. 29), with the result being less severe language impairment (Armon-Lotem 2010; Paradis 2010).

4.3.3 Gender

As was discussed in chapters 2 and 3, the difficulties that adult L2 learners of French have with the acquisition of gender has been thoroughly documented; whereas the acquisition of gender in L2 children and French-speaking children with SLI has arguably received less attention. In the literature on SLI and on the SLI-L2 comparison, the focus has largely been on the acquisition of verb morphology in various languages and on object clitics in the context of French. Moving on to the nominal domain, the current section discusses studies which have evaluated gender agreement in French and Dutch using cross-learner comparisons (bilingual and monolingual SLI and TD bilinguals).

4.3.3.1 Paradis & Crago (2004)

Paradis & Crago (2004) investigated morphosyntactic properties of the DP in the spontaneous language of a group of French-speaking monolingual SLI and TD L2 children compared to a group of L1 TD children. Studying the DP can inform the debate concerning the (E)OI stage in developing grammars and the role of L1 transfer in L2 child acquisition. The goals of this study were to see if SLI and L2 children had difficulties in the DP domain to the same extent as they do with tense morphemes in the verbal domain and to compare the SLI and L2 groups on their performance of determiner suppliance, gender- and number-marking, and the order of the adjective with respect to the noun in French. As mentioned previously, the EOI/EUCC approach predicts a greater quantity of errors with tense morphemes compared to non-tense morphemes; therefore, if the SLI and L2 children have as much trouble with nonsense (determiners) as tense morphemes, this will constitute evidence against the EOI/EUCC account. Furthermore, the EOI account predicts that omission errors will be more frequent than substitution errors. Therefore, frequent errors in gender marking on determiners would provide evidence against this approach. However, if the SLI and L2 children differ in their DP morphosyntax because of the influence of the L1 (English) of the L2ers, then one would expect to see more errors with gender and number because English does not have grammatical gender and does not mark number in the same way as French. The L2ers may also make errors with postnominal adjective placement in French because adjectives are produced in prenominal position in English.

The participants in this study consisted of a group of 15 typically-developing L2 children (mean age = 6;10; LoE = 2;0; MLUW = 4.09), a group of 10 L1 French-speaking children with SLI (mean age = 7;6; MLUW = 3.98), a group of 10 TD 3-year-olds and 10 TD7-year-old L1 French-speaking children. The L2 children were attending French medium schools in which they interacted with native French-speaking children the majority of the time. The L2ers began their exposure to French upon entry into kindergarten. Spontaneous language samples were collected and coded for suppliance or omission of determiners and the accuracy with number and gender marking on determiners. The elided determiner *l' (* singular, definite), which appears in front of a noun with an initial vowel, was excluded from this count because it is not marked for gender. Amalgamated forms in partitive and locatives, such as *du* (*de ‘of’+le.*MASC) and *au* (*à ‘to’+le.MASC*) were also coded. Adjectives were coded according to their placement type (pre- or postnominal) and whether they were pronounced in the target position.

Mean suppliance rates for determiners showed that all child groups supplied them in at least 90% of obligatory contexts. All groups marked number with very high accuracy (mean accuracy rate of greater than 98%). For gender, all mean group accuracy rates were above 85% for both masculine and feminine genders; however, the L2ers and the children with SLI were significantly less accurate than the TD7. In addition, the L2ers were significantly less accurate than the TD3. There were no other significant differences between groups. Almost all adjectives were placed correctly; however, all groups produced very few adjectives which require postnominal placement.

Based on the accurate performance of both the L2 and SLI on determiner suppliance, number marking and to some extent, gender marking, the authors argue that the L2ers also display patterns associated with the (E)OI stage as well as weaker performance on tense morphemes. The authors used the results on tense morphology from Paradis & Crago (2000) (see Section 4.2.1.2). These results do not support the maturational model explanation given for the (E)UCC because L2 children this age have already matured for this property; and therefore, the UCC, the linguistic constraint hypothesized to be behind the OI stage in developing grammars, should no longer be operative in child L2 grammars. The authors propose to consider that all types of child language acquisition contexts can be characterized by the presence of an OI stage and that the OI stage is not specific to the primary language acquisition period. Paradis & Crago conclude that the mechanisms behind the OI stage must be operative throughout childhood and maturation does not bring about an end to these mechanisms. Furthermore, the findings do not support the hypothesis that the DP functional structure is transferred from the L1 to the L2 in TD English-speaking children learning French as an L2. The fact that both the L2 and the SLI had difficulty with gender marking suggests that trouble with gender is not due to inference from the L1. The child L2ers performance on gender marking on determiners in spontaneous language resembles adult L2 learners more closely than simultaneous bilinguals. The authors suggest that the more mature cognitive and linguistic systems of the L2 child learners may be responsible for these differences in gender marking.

In my opinion, a more detailed look at the individual results concerning the type of gender error per context (i.e., overuse of feminine versus overuse of masculine gender) might shed some light on subtle differences between the SLI and the L2 for gender agreement. L2 learners have been shown to adopt a default gender (i.e., they make errors with the same gender) and it would be interesting to find out if the SLI did this as well. Judging from the results (estimated from Figure 3, p. 101), it appears that the SLI were more accurate with masculine gender (*M* = 97%) more often than the feminine (*M* = 86%); whereas the L2 children appeared to have made more accurate with the feminine gender (masculine: *M* = 88%; feminine: *M* = 93%). The SLI’s higher group accuracy rate for the masculine gender suggests that these learners are overusing the masculine in feminine contexts instead of the other way around, whereas the L2 have the opposite pattern.

4.3.3.2 Orgassa & Weerman (2008)

Orgassa & Weerman (2008) investigated gender agreement in Dutch using essentially the same population and design as Orgassa (2009). Recall that Orgassa's (2009) work (see Section 4.2.2.2) involved testing the predictions of the representational view against the processing view of SLI. The authors argue that, according to the representational view, children with SLI should perform like L2 adults and cumulative SLI and L2 effects are not expected for L2-SLI children. The processing view, on the other hand, predicts that L2 adults will pattern differently from all child learners and the L2 children with SLI will exhibit a "double delay" compared to their impaired monolingual peers because of cumulative effects from the bilingual and impaired context. Orgassa's (2009) results for verb placement revealed no significant differences in this domain among various learners groups, including TD L1, L1-SLI, TD L2, L2-SLI children in addition to TD L2 adults; however, the L1 and L2 children with SLI were significantly less accurate than their unimpaired peers for verb inflection.

Gender marking on definite determiners and adjectives was targeted by this study. As mentioned in Chapter 2, the common-neuter gender distinction is marked on the definite determiners *de* and *het*. Attributive adjectives also have a special rule for neuter agreement in singular indefinite noun phrases (30a). Neuter adjectives in this context require the bare form of the adjective (*groot*). In all other contexts (30b-f), adjectives carry the schwa *–e* suffix. The form of the adjective in (30a) is therefore a special case of adjectival gender agreement.

(30)	a.	Een groot paard 'A big horse'	indefinite, singular, neuter
	b.	Een grote appel 'A big apple'	indefinite, singular, common
	c.	De grote appel 'The big apple'	definite, singular, common
	d.	Het grote paard 'The big horse'	definite, singular, neuter
	e.	De grote paarden 'The big horses'	definite, plural, neuter
	f.	Grote paarden 'Big horses'	indefinite, plural, neuter

Roughly the same participants from the verb inflection task (Orgassa 2009, see Section 4.2.2.2) also took the gender tasks. The characteristics of the population for the gender tasks are as follows: 1) 32 TD L1 children aged 4;1–5;11 (*M* = 4;11); 2) 25 L1-SLI aged 6;2 – 8;0 (*M* = 7;3); 3) 19 TD L2 children aged 6;3 – 8;6 (*M* = 7;4), with an AoO between 1;0 - 4;0, and a mean LoE of 5;3 at the time of testing; 4) 20 L2-SLI aged 5;11 - 8;3 (*M* = 7;5), with an AoO between 1;0 - 4;0, and a mean LoE of 5;2; 5) 9 TD L2 adults aged 18-31 (*M* = 26;5), with an AoO of no younger than 15 years old, and a LoE of 3;2. The L1 of the L2 groups was Turkish. The TD L2 groups and the L1 and L2 children with SLI were recruited according to the criteria discussed in Section 4.2.2.2.

Gender marking on adjectives was evaluated using a sentence completion task involving 10 high-frequency non-derived singular root nouns. Color adjectives ('green', 'blue', 'red', 'yellow') and four contrasting adjectives ('small-short' and 'big-tall') were elicited as part of the protocol. The task involved a definite and indefinite condition and each noun was used twice, once per condition. A picture depicting two objects was presented to the participant. In the indefinite condition, the experimenter introduced the objects to the participant, as in (31a). In the definite condition, the participant is asked to describe a minimal contrast between the objects as in (31b).

(31)	a.	Experimenter:	Kijk, twee glazen. Dit is een... 'Look, two glasses. This is a ...'
		Expected response:	groot glas 'big glass'
		Experimenter:	en dat is een… 'and that is a'
		Expected response:	klein glas 'small glass'
			(indefinite condition)
	b.	Experimenter:	Ik pak .... 'I take…'
		Expected response:	het grote glas 'The big glass'
			(definite condition)

Another sentence completion task was used to elicit definite determiners. A picture depicting two objects which were placed in a specific configuration was presented to the participant who was then asked to describe the position of one object with respect to the other, as in (32).

(32)	Experimenter:	Kijk, een vliegtuig. Waar is Kroko? Kroko staat voor ... 'Look, a plane. Where is Kroko? Kroko stands in front of...'
	Expected response:	het vliegtuig 'the plane'

For gender marking on determiners, all L2 adult and child users were predicted to overuse the common determiner *de*, as has been shown in previous research (e.g., Unsworth 2008). For adjectives, previous studies demonstrated that adult L2 learners overuse both the suffix *-e* and the bare form (Weerman et al. 2006). Therefore, if the children with SLI produce these types of errors, this will constitute evidence for a representational impairment in SLI. The results for gender marking revealed that both SLI groups produced a higher rate of overgeneralization of *de* in neuter contexts compared to TD L2 and L1 groups and impaired L1 groups.

For *het*, the TD L1 children had better performance than the TD L2 children and the L1-SLI had better performance than the L2-SLI. The L1-SLI group had significantly weaker performance than the younger TD L1 children and the L2-SLI performed significantly lower than the TD L2 children. However, there were no significant differences between the TD L2 children and the L1-SLI. A similar pattern was observed for the production of bare nouns (determiner omission). The TD L2 produced significantly more bare nouns than the TD L1 and the L2-SLI produced significantly more than the L1-SLI. This result differs from what was shown for object clitics in French (Paradis et al. 2003). Recall from Section 4.3.2.1 that the L2-SLI had stronger performance for object clitics in French than the L1-SLI.

Orgassa (2009) also analyzed data from a diminutive condition with (roughly) the same population. Most child learner groups were significantly more accurate in the diminutive condition which contained a morphological cue for neuter gender, except for the L2-SLI, as mentioned previously. The difference between the diminutive and the non-derived noun conditions was significant in all groups except the L2-SLI, who rarely produced *het*. Orgassa (2009) also pointed out that chronological age in the L1 groups was correlated with the assignment of neuter gender: the older children in both TD and SLI groups became more accurate with neuter gender as age increased. In the L2 groups, however, there is no correlation between length of exposure and neuter gender assignment.

Concerning adjectival agreement, the SLI and adult L2 groups did not produce similar error types. The L2 adults overused *-e* and bare adjectives; whereas all child groups overused the default *-e*. Because the adults made both types of errors, they had the lowest mean group scores in all contexts (neuter indefinite, neuter definite, common definite, common indefinite). In contrast, the child groups had high scores in contexts requiring the *-e* suffix (> 87%), but had very low scores the indefinite neuter (bare adjective) context. When looking at the scores for the neuter indefinite, L1-SLI (mean accuracy rate = 31%) scored significantly lower compared to the TD L1 group (45%). TD child L2ers (23%) performed significantly lower in neuter indefinite contexts compared to TD L1 children, but there was no significant difference between the TD L2 children and the L2-SLI children (16%). Although no significant difference was found between the L1-SLI and L2-SLI groups, the authors considered the very low scores for the L2-SLI as evidence for a cumulative effect of both SLI and L2 on their development. LoE was not correlated with performance on adjectives in the L2 groups (Orgassa 2009).

The authors claim to have found no evidence for the predictions of the representational account of SLI, given the different types of errors produced by the L2 adults compared to the SLI. However, the results on gender seemed to reflect a cumulative effect of L2-SLI, which supports one of the predictions from the processing approach. Orgassa and Weerman argue that cumulative effects were found in the L2-SLI population since these children appear to have a very restricted, possibly non-existent, gender system. These findings suggest that the L2 context can have a "limiting effect on SLI if a large amount of consistent input is required for rule acquisition" (Orgassa 2009, p. 166). Gender agreement in Dutch is an example of such a rule. The authors therefore interpreted the results as being indicative of a reduced input problem in children with SLI. However, the L2-SLI did not score significantly lower than the L1-SLI on all measures.

Orgassa and Weerman (2008) state that their results show that the significant difference between the TD L2 and TD L1 children's performance for gender can be explained by a lack of input in the TD L2 children. The TD L1 and L2 children were matched on years of exposure to Dutch. In other words, the TD L1 children's chronological age matched the TD L2 children's LoE. The authors argue that controlling LoE in such a manner would make these groups more comparable. In my mind, the differences in chronological age cannot be ignored here. Furthermore, although the effect of LoE was analyzed, the potential effect of age of onset in the L2 groups was essentially ignored. Recall from Chapter 2 that some research has found differences in acquisition in children who are exposed to the L2 after roughly 3 or 4 years old. The L2ers (TD and SLI) in this study ranged in AoO from 1:0 to 4;0. It seems that more attention could have been paid to this factor as well.

Orgassa and Weerman note that, unlike gender, verb morphology in Dutch requires overall less exposure, which explains why overall accuracy in this domain was high in all child groups. If long exposure is needed to acquire a certain rule, then child L2ers, because they split their time between two linguistic systems, may not receive enough input in Dutch while still within the critical period for language acquisition, and as a result, certain grammatical rules may fossilize before reaching the target setting. Children with SLI, who need more input than TD children before being able to deduce grammatical rules, may also exit the critical period before certain grammatical rules are in place and therefore these may remain incomplete.

Summarizing the results for grammatical gender, as we have seen by the small number of studies in this section, the acquisition of grammatical gender has not been frequently studied from an SLI-L2 comparative perspective. Furthermore, a limited number of gender-marked categories have been evaluated, especially for French. The studies cited here had certain theoretical goals in mind. Paradis & Crago (2004) looked at gender marking to determine whether this domain was less vulnerable than tense morphology, which would support the predictions of the (E)OI/(E)UCC account. Orgassa & Weerman's (2008) objective was to see if the representational or processing account of SLI could better explain the patterns in gender marking by various learner groups. Both of these studies based their conclusions on the comparison of group means.

In my mind, a general remark that can be made about these studies is that individual results are not sufficiently analyzed. Sometimes standard deviations are not reported. Moving forward, it seems important to present individual results with more detail seeing as group means can mask other potentially interesting patterns in the data. Analyzing individual data or reporting the number of children from each group who followed a specific pattern could strengthen theoretical conclusions and would be more helpful in characterizing differences between TD L2 children and L2 children with SLI.

4.4 Syntactic Structures and Processing

The previous sections have focused on the SLI-L2 comparison with respect to the use of certain morphosyntactic properties (verb morphology, object clitics, and gender). In comparison, very few have focused on potential differences in the production or comprehension of syntactic structure. As seen in Chapter 3, children with SLI have been shown to avoid relative clauses, while the same structure has been shown to emerge relatively quickly in child L2 development. In the acquisition literature, syntactic structures entailing operations such as movement and/or long-distance dependencies are often associated with an increase in processing demands (e.g., Guasti 2002). The difficulties that children with SLI exhibit with respect to such structures have been attributed to the widely-documented processing limitations in affected children (see Leonard 1998 and references cited therein).

Previous work on SLI has shown that these difficulties often manifest themselves in the production of ungrammatical morphological forms or the avoidance of the particular structure in question (e.g., Tuller et al. 2012). This section will therefore discuss research which compares L2 children and children with SLI on the use (or avoidance) of certain syntactic structures and their potential effect on morphosyntactic accuracy. Given the role that processing is assumed to play in the production of syntactic structure, comparative research on both linguistic and non-linguistic processing will also be discussed.

4.4.1 Simon-Cereijido & Gutiérrez-Clellen (2007)

Simon-Cereijido & Gutiérrez-Clellen (2007) aimed to measure the sensitivity and specificity of linguistic measures in spontaneous speech. Specificity and sensitivity are used to rate the effectiveness of a measure to correctly classify TD children as TD and children with SLI as SLI. Specificity is the percentage of true negatives (TD children who were not classified as SLI). Sensitivity is the percentage of true positives (i.e., how many children with SLI were identified as SLI).

So far, the studies presented in this chapter have focused on the second language of the TD L2 children, but information about the L1 is also relevant to the profiles of impaired and unimpaired L2 children. Problems in the L1 can signal that weak performance in the L2 stems from language impairment. However, weak performance in the L1 can also be the result of L1 attrition, which can be the (healthy) result of acquisition in a bilingual context in which the learner uses his or her L1 with less frequency or the onset of L2 exposure begins at a sensitive age (Montrul 2008b). Simon-Cereijido & Gutiérrez-Clellen (2007) studied a group of monolingual and bilingual Spanish-speaking children from Mexican-American communities in the US. Most of the children in this study were monolingual, but a subset of them were labeled "bilingual" because parental questionnaires revealed relatively frequent exposure to and use of English by these children ("better than limited English proficiency") compared to the monolinguals. Because of the growing population of Spanish-speaking monolingual and bilingual children in the US, there is a serious need to understand the markers of SLI in the Spanish of both monolingual and bilingual children. Simon-Cereijido & Gutiérrez-Clellen (2007) note that because Spanish learners do not go through a very prominent RI stage, verb morphology measures alone are not expected to be reliable indicators of SLI in Spanish-speaking populations.

The primary goals of their study concerned (1) the identification of specific grammatical measures that best characterize the linguistic deficits as well as (2) determining the role of verb argument structure and syntactic complexity (the authors assume that ditransitive verbs are more complex than transitive verbs) in identifying SLI in L1 Spanish-speaking (SS) children. A secondary goal was to see if the criteria established for identifying language impairment in monolingual Spanish-speaking children could also identify language impairment in Spanish-speaking children acquiring English as their L2.

Twenty-four SS TD children and twenty-four SS children with language impairment (LI) from Texas and California participated in this study. Five of the TD and six of the affected children were labeled "bilingual", according to the procedure described above. The majority of these children were of Mexican American origin. The TD children were aged 4;7 on average (*SD* = 0;4) and the children with LI were aged 4;6 (*SD* = 0;5). No widely accepted method exists for diagnosing language impairment in SS children in the US. As there are no valid standardized tests to identify disorders in this population, the authors used the criteria explained in Gutiérrez-Clellen et al. 2008 (see Section 4.2.2.4). Roughly one-third of these children were seeing a speech-language therapist and the other children had been referred for an evaluation because of concerns expressed by a parent and/or teacher.

Spontaneous language samples in the form of narratives were elicited using wordless picture books from the tasks "Frog on his Own" and "Frog Goes to Dinner." The experimenter first told the story to the child who was then asked to retell the same story. Spontaneous language data were coded to obtain MLUW and an ungrammaticality index (Ungramm) (percentage of utterances with grammatical errors). Furthermore, omission and substitution error rates involving articles, verbs, and clitics were calculated. Clitic errors included the omission of the clitic in clitic doubling contexts as in (33 a, b) and in reflexive *se* constructions as in (34 a, b).

(33) a. *dio a él una manzana
‘s/he gave him an apple’

b. le dio a él una manzana
‘s/he gave him an apple’

(34) a. *el barco hundió
‘the boat sank’

b. el barco se hundió
‘the boat sank’

The rate of theme argument production (clitic or DP) out of all obligatory contexts was also calculated. Direct object omission was counted as DP omission and not clitic omission because of the difficulty in deciding what form the child intended to produce. Finally, the number of ditransitive verbs out of all verbs was used to obtain a measure of the frequency of complex verb argument structures.

Data from nineteen children with language impairment and nineteen TD children were used in an exploratory study (TLD mean age = 4;6, *SD* = 0;4; LI mean age = 4;8, *SD* = 0;4). A discriminant function analysis on the measures mentioned above revealed that a combination of different measures had higher sensitivity and specificity compared to individual measures in isolation. For example, composite scores including both MLUW and Ungramm (sensitivity: 79% (15/19); specificity: 100%), a morphological model including clitic, verb and article accuracy scores (sensitivity: 79% (15/19); specificity: 100%), and a semantic-syntactic model including MLUW, theme argument production and ditransitive verb ratio correctly identified the largest number of children (sensitivity: 79% (15/19); specificity: 68%).

A confirmatory study was performed by using the same measures on a second group of children (five TD: age *M* = 4;5, *SD* = 0;4; and five LI: age *M* = 4;5, *SD* = 0;6). The goal of this study was to see if the initial discriminant function analysis could correctly distinguish children with SLI from TD children in the second group. The same combination of measures correctly identified a high percentage of children in the confirmatory study. Furthermore, the same analyses were carried out with the children from the study who had been labeled as being "bilingual" (see above). The bilinguals included 11 children (5 TD, 6 SLI). The same discriminant function analysis was applied to this subgroup of children. The morphological model correctly classified 100% of the bilinguals and the semantic-syntactic model correctly classified 82% (9/11) of these children. The bilingual error rates had been expected to differ from the monolingual Spanish children. Based on the influence of English, the prediction had been made that bilingual children would exhibit greater rates of article and clitic substitutions and omissions and fewer theme omissions. However, the results indicated that gender and number substitutions were produced at a similar rate in both bilingual and monolingual groups. Although there were not a large quantity of theme omissions, the TD bilingual children appeared to omit direct objects less often than TD monolinguals. These differences between monolinguals and bilinguals should be interpreted with some caution as individual variation was very high.

The authors concluded that the discriminant function analysis gives similar results on both monolingual and bilingual Spanish-speaking children. When examining cases of misclassification, seven children with SLI were correctly classified by only one model. Three were correctly identified as SLI by the morphological model and missed by the semantic-syntactic model, while the other four were classified as SLI by the semantic-syntactic model and misclassified as TD by the morphological model. The children who were classified by morphology had a higher MLUW (M = 6.32, SD = 0.84) than the four classified by the semantic-syntactic model (M = 4.00, SD = 1.15). Thus, the morphological model missed those children who produced fewer errors, most likely because they relied on simple syntax (i.e., low MLUW and few ditransitive verbs). The authors advance the idea that the use of simple syntax by these children may reflect language processing limitations. On the other hand, the children misclassified as TD by the semantic-syntactic model (i.e., correctly classified by the morphological model), used more complex utterances as evidenced by their higher MLUW. The authors argue that these children's utterances provided more opportunities for errors. Interestingly, this approach was also equally successful at distinguishing bilingual children with language impairment from TD bilingual children on the basis of their first language.

I would argue that the findings from Simon-Cereijido & Gutiérrez-Clellen (2007) suggest that attention should be paid to the types of structures (here: transitive versus ditransitive verbs) that are used and the effect this may have on the quality and quantity of errors in spontaneous language. Furthermore, the method used here was just as accurate with the classification of the bilingual as the monolingual children, which suggests that this type of analysis of the L1 of children in dual language environments is reliable. This is important because natural effects of L1 attrition have the potential to be misinterpreted as evidence of language impairment.

4.4.2 Prévost et al. (2010)

As was discussed in Chapter 3, young TD children and children with SLI have been shown to avoid certain structures which are often characterized as complex (e.g., relative clauses). The Derivational Complexity Hypothesis (Jakubowicz 2004) (DCH, see Section 3.4.3.1) predicts that derivationally complex structures are acquired later in TD acquisition and are avoided by children in atypical acquisition contexts. The DCM (repeated here in 35) proposes that complexity increases with the number of instances of external and internal merge (movement).

(35) Derivational Complexity Metric (DCM) (Jakubowicz 2004, 2005, 2010)

a. Merging αi n times gives rise to a less complex derivation than merging αi (n + 1) times.

b. Merge of α gives rise to a less complex derivation than Merge of $\alpha + \beta$.

As seen in Chapter 2, little is known about the role of computational complexity in L2 children. Furthermore, as we have seen in the current chapter, a large portion of the comparative studies have focused on verb morphology and object clitics. The goals of this study were therefore to investigate the role of complexity in child L2 acquisition and to increase the domains over which SLI and L2 children are compared In order to do so, Prévost et al. (2010) applied the DCH to the L2-SLI comparison using wh-questions in French. Wh-questions in French provide an ideal testing ground for complexity effects in acquisition, because this language has optional[57] interrogative strategies which differ in terms of the number of merge operations involved in their derivation. Applying the DCM, interrogative structures in French increase in complexity (cf. 36).

[57] However, there are some exceptions to this optionality. For example, *pourquoi* ‘why’ cannot occur in situ. There are also a couple of restrictions on the use of ‘what’. *Que* ‘what’ can only be used in fronted questions followed by a verb, such as inversion. *Quoi* ‘what’ can only be used in situ. We follow Hulk & Zuckerman (2000) in assuming that although this optionality is not entirely genuine, all alternatives are allowed in many contexts, without affecting the interpretation or the grammaticality of the question.

(36) Interrogative strategies in French and English

Strategy	French	English
In situ	a. Tu as vu qui?	*You have seen who(m)?
Plain fronting	b. Qui$_i$ tu as vu t$_i$?	*Who$_i$ you have seen t$_i$?
Wh-Fronting: *est-ce que* (ESK)	c. Qui$_i$ est-ce que tu as vu t$_i$?	*Who$_i$ is it that you saw t$_i$?
Wh-Fronting: cleft	d. C'est qui$_{(z)}$[Op$_z$ que tu as vu t$_z$]?	*It's who$_{(z)}$[Op$_z$ that you saw t$_z$]?
Wh-Fronting with inversion (I to C)	e. Qui$_i$ as$_j$-tu t$_j$ vu t$_i$?	Who(m)$_i$ did$_j$ you t$_j$ see t$_i$?

Table 4-1. Interrogative strategies in French and English.

The in situ strategy (36a) involves a single external merge operation and no overt movement and therefore is the least complex of the interrogative strategies. We adopt the term "plain fronting" for the strategy in which the wh-word is fronted, but there is no additional movement or functional material added (36b). This strategy is more complex than in situ because it involves the movement of the wh-word. Fronted questions with *est-ce que* (36c) and clefts (36d) involve the external merging of functional material and they are therefore more complex than (36a) and (36b). Following Jakubowicz (2011), we assume movement of the wh-word in (36c) and movement of the empty operator in clefts[58] (36d). Finally, the most complex of these strategies, wh-movement with inversion, involves two separate movement operations: wh-fronting and I-to-C movement. Therefore, according to the DCH, in situ should emerge before fronting, plain fronting before fronting with *est-ce que* or with cleft, and fronting with inversion should emerge last.

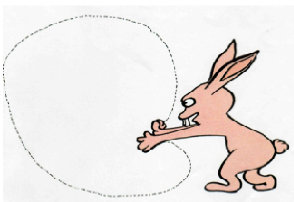
Moreover, as can be seen from the English equivalents in (36), grammatical alternatives do not exist in English for each French interrogative strategy. The only option for non-echo questions in English involves fronting and I-to-C (cf. 36e), which corresponds to the most complex alternative in French. Therefore, studying wh-questions in L2 and SLI learners using

[58] See Belletti (2008) for a recent syntactic analysis of French clefts and Tuller & Hamann (2010) for their acquisition.

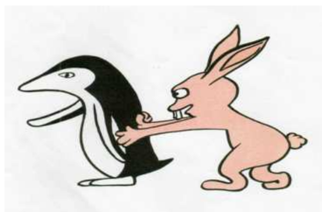
this language combination allows us to explore the influence of transfer and complexity in L2 acquisition.

Nineteen L2 children, aged 9;9 on average (*SD* = 1;9, range: 6;8 – 12;7) participated in the study. Their mean AoO was 6;11 (*SD* = 1;9; range = 4;3 – 9;10) and their mean LoE was 2;10 (*SD* = 1;0; 0;11 – 4;6). The children with SLI were aged 9;4 on average (*SD* = 2;3; range = 6;6 – 12;11). Three TD monolingual control groups also took part in the study. There were 17 four-year-olds (TD4) (mean age = 4;2, *SD* = 0;2, range = 4;0 – 4;5), 12 6-year-olds (TD6) (*M* = 6;5, *SD* = 0;2, range = 6;2 – 6;8), and 12 adults (*M* = 22;0, *SD* = 1;2, range = 19;4 – 24;3).[59]

To elicit wh-questions, a picture task targeting animate object, inanimate object, subject, and adjunct questions ('why', 'where' and 'how') was used. A notebook containing two versions of each picture was used to administer the task. The first version of the picture contained one visible character (Picture 1), while the part of the picture depicting the subject, object or adjunct was missing. The experimenter first showed the picture with the missing element and requested that the participant ask the visible character a question about this element. After the question was produced by the subject, the researcher turned the page to show the second version of the picture in which the hidden element was visible (see Picture 2). An example of the prompt for an animate object question is given in (37). Participants were free to produce any of the possible wh-question types. Possible expected responses are given in (38a-e).



Picture 1: Elicitation of an animate object question: "The rabbit is pushing someone, But we can't see who. Ask him."



Picture 2: Animate object revealed

[59] The experimental and control populations from Prévost et al. (2010) form a subset of the population of this thesis. See Section 6.2 for more information about these children.

(37) Experimenter: Le lapin pousse quelqu’un, mais on ne voit pas qui. Demande-lui.
‘The rabbit is pushing someone, but we can’t see who. Ask him”’

(38) a. Tu pousses qui ?
you push who
‘Who are you pushing?’

b. Qui tu pousses?
who you push

c. Qui est-ce que tu pousses?
who is it that you push

d. C’est qui que tu pousses ?
It’s who that you push

e. Qui pousses-tu ?
who push you

The children with SLI were predicted to produce higher rates of in situ questions, thereby avoiding movement and decreasing the processing load involved in the task. However, the question remained open as to the expected behavior of the L2 children. The L2ers could be expected to avoid movement, like the SLI, to lessen processing demands or they could also be expected to use fronted questions because of the influence from English, their L1, which does not allow the use of the in situ strategy in non-echo questions.

Analyses concerning the use of in situ (36a) versus fronted strategies (36b-e) revealed that the SLI and L2 used a significantly lower rate of fronted wh-questions (L2: M = 58.1%, SLI: M = 41.2%), than the L1 controls (TD4: M = 79%, TD6: M = 98%, adults: M = 100%). The L2 used a higher rate of fronting than the SLI, but this difference was not significant. Furthermore, within-group comparisons revealed no significant difference between the rates of in situ and fronted questions in either the SLI or L2 groups (L2 in situ: M = 41.9%; SLI in situ: M = 58.8%). However, both TD groups produced a significantly higher rate of fronted questions compared to in situ and a significantly higher rate of fronting compared to the SLI and to the L2 groups. In other words, the L2 and SLI groups used in situ as often as they used fronted questions, while the TDs clearly favored fronted questions. Concerning the strategies used in wh-fronted questions, the most common strategy was plain fronting in all child groups. The TD child and adult groups used the *est-ce que* (36c) significantly more often than the SLI. The difference was not significant when compared to the L2. Inversion was used often by the TD adults, but rarely by the child groups. Based on the fact that the L2 children patterned with the children with SLI in avoiding movement (thus, complexity) instead of transferring wh-properties from the L1, the authors concluded that computational complexity plays a significant role in child L2 acquisition.

These findings show that the L2 children and children with SLI pattern together, not only with respect to the morphosyntactic properties discussed earlier, but also on the frequency of use of wh-question strategies. The authors also argued that reduced processing capacity is responsible for patterns observed in the L2 group, "because of their L2 situation" (Prévost et al. 2010, p. 422), and in the SLI group, given that processing capacity limitations have been shown to be characteristic of this learner context (e.g., Jakubowicz 2004; 2011). A significant correlation was found between the rate of fronting and the French standardized sentence completion task in the L2 group which suggests that fronting increases with proficiency. There was no significant correlation found between LoE and any of the experimental or standardized measures.

The children with SLI and the L2 children differ from the TD L1 4- and 6-year-olds in their choice of interrogative strategies: The SLI and L2 produced more in situ while the TDs produced more questions with wh-fronting. Nevertheless, it is important to keep in mind that in situ questions are a completely grammatical possibility. However, the question remains as to why the L2 and SLI would produce fewer fronted questions than younger TD children. If children with SLI have limited working memory resources and L2 children strain their cognitive resources when they function in their L2 (for reasons of automaticity, for example), then it seems to me that the avoidance of more complex interrogative strategies can best explain the divergent patterns in the TD children versus the SLI and L2 children.[60]

Prévost et al. (2011) performed longitudinal analyses on a larger population which included the same groups and methodology from Prévost et al. (2010). The participants in this follow-up study included a group of 29 L2 children (L1 English), aged 9;5 on average (range: 6;4 – 12;7) as well as a group of 27 monolingual children with SLI aged 9;5 (range: 6;5 – 12;11). The same TD4 and TD6 child data were used from Prévost et al. (2010).

[60] Frequency of one interrogative strategy over another does not seem to account for the findings. Sociolinguistic studies have shown that wh-fronting structures are more frequent than wh-in situ (Coveney 1996; Lefebvre 1987). Therefore, frequency cannot explain why in situ questions were produced more often by the SLI and L2 groups.

The main objectives of the study were to find out how the performance on the question task develops over a 12-month interval in these children and if the complexity of the interrogative strategy was associated with a higher error rate. The data on fronting versus in situ questions revealed no significant change over a 12-month period. In other words, the L2 children and children with SLI maintained the same pattern in which they avoid fronting and leave the wh-word in situ. Concerning the link between complexity and error rates, both the SLI and L2 children had a significantly higher mean rate of erroneous fronted questions compared to in situ. This result was found at T1 and T2 and suggests that the complexity of the interrogative type is linked to a higher error rate. Prévost et al. hypothesize that the greater processing load involved in the derivation of more complex questions may create a situation in which morphological errors are more likely to occur. No significant effect was found for AoO, but LoE was inversely correlated with error rates at T1 in the L2 group. Moreover, different types of errors were made by the SLI group. Several children with SLI produced subject omissions, root infinitives, and used protoforms (usually [e]). The L2 children, on the other hand, rarely made omission errors or used RIs and never used proto-syntactic devices.

4.4.3 Kohnert et al. (2009)

The purpose of this study was to explore linguistic and non-linguistic processing in TD L2 children and monolingual children with SLI. Although the primary problem exhibited by children with SLI has to do with language, many researchers argue that weaknesses in basic nonlinguistic processing skills characterize this population as well (Leonard 1998). Kohnert and colleagues explain that although the role of these processing limitations in SLI is still under debate, most researchers agree that children with SLI are slower and less efficient on perceptual processing and cognitive tasks such as those involving fine motor skills and cognitive imaging tasks. Because these processing limitations are associated with SLI,[61] but not with TD L2 children, one would expect TD L2 children to perform better than the SLI on general processing tasks that do not require the use of language. With this in mind, Kohnert et al. (2009) set out to compare and contrast the performance of L2 children and children with SLI across a series of cognitive tasks. The nature of these tasks varied. Certain emphasized perceptual-motor demands and were non-linguistic, while others involved the use of language.

[61] Kohnert and colleagues prefer the term primary language impairment (PLI), but I will stick with SLI for the sake of consistency.

The participants in the study were 22 TD L2 children (TD L2) who acquired Spanish as an L1 then English as an L2, 28 monolingual English speakers with SLI, and 50 TD monolingual English speakers (TD L1). These children lived in the United States and ranged from 8 to 13 years old. The L2 children had 4–8 years of systematic exposure to English and were proficient in both Spanish and English. The L2ers were performing at or above grade level, which suggested that they were typically-developing children.

Seventeen cognitive tasks emphasized perceptual-motor demands, nonlinguistic, or linguistic demands. Response times on accurate responses and off-line responses were the variables of interest. These tasks were divided into five groups: 1) perceptual-motor tasks, such as auditory and visual detection, which involve detecting the presence of tones and colors, respectively, 2) lower-level nonlinguistic tasks, which involve comparing visual and auditory stimuli, 3) higher-level symbolic tasks, involving mental rotation and form completion, 4) linguistically-mediated tasks, such as counting and listen spans and nonword repetition, 5) language tasks including picture identification and lexical decision tasks. All tasks were administered in English, but crucially, the tasks in groups 1-3 did not involve language.

Kohnert et al. (2009) predicted that the children with SLI would have weaker performance on linguistic tasks than the TD L1 children and weaker performance on nonlinguistic tasks compared to both the TD L1 and L2 groups. The TD L1 group was also expected to perform better than the TD L2 group on language tasks, but their scores on the nonlinguistic tasks were expected to be similar.

The results showed that, as expected, the TD L1 and L2 groups patterned together, while the SLI had weaker results on several perceptual-motor and higher-level symbolic tasks, such as auditory pattern matching, mental rotation and visual form completion. Linguistically-mediated tasks, such as counting and listening spans and nonword repetition, advantaged the TD L1 children over the TD L2ers. The TD L1 children had significantly higher scores than the TD L2ers on such tasks, even though many of the L2ers had considerable exposure to English. The authors conclude that, according to their findings, the most robust differences between the TD groups (L1 and L2) and the impaired group could be observed via nonlinguistic tasks.

In summary, this section presented studies which have approached the L2-SLI comparison from a slightly different angle than the work presented in the prior sections of this chapter.

Instead of comparing the performance of these different learner groups solely on their ability to produce target morphosyntactic forms, the work examined in the current section focused on the types of syntactic structures used and/or on linguistic or nonlinguistic processing abilities. Simon-Cereijido & Gutiérrez-Clellen's (2007) discriminant function model showed that MLUW and the type of verb argument structure used in spontaneous language is associated with higher error rates in some children. They proposed that processing limitations in children with language impairment could explain this type of pattern in spontaneous language. Prévost and colleagues (2010, 2011) showed that TD L2 children, like L1 French-speaking children with SLI, avoid more complex interrogative structures in French. However, some quantitative differences involving error rates were observed between the two groups. Finally, Kohnert et al. (2009) documented differences in nonlinguistic processing skills in monolingual children with SLI and L2 children. The production of syntactic structure and the link with processing capacities have not been thoroughly explored using a L2-SLI comparative design; however these findings suggest that this sort of approach could contribute to a better understanding of TD L2 and SLI development.

4.5 Examining the Impact of L2 Factors on SLI-L2 Comparisons

This section provides a brief recapitulation of the characteristics of the L2 and SLI populations studied in this chapter. The idea here is to discern the gaps in this relatively new field of comparative research and to understand how differences in L2 factors can influence the similarities and differences in the SLI-L2 comparison. Lastly, a study which explores L1 assessment via parental questionnaire is reviewed. Although the factor of L1 attrition has so far received less attention than L2 development in this literature review, it is essential to consider its role in identifying impairment in the L1.

Given the relatively small number of studies which have undertaken direct comparisons of children with SLI to TD L2ers, it is no surprise that there currently remain many gaps to fill in the research on these children. One issue with the current research is that there is not enough diversity in terms of the L2 acquisition factors discussed in Chapter 2. For example, concerning chronological age, the bulk of the studies reviewed in this chapter have included children at or below the age of 9, with some exceptions. Paradis (2010b) observed that little is known about the L2-SLI comparison in children beyond this age.

Moreover, most L2 children studied so far have an age of onset that is within what many assume to be the critical period for language acquisition (i.e., roughly younger than 7 years old). So, little is known about differences between SLI and L2 children when L2 exposure began after the supposed critical period age range. Even if some L2 children vary in their age of onset, this variable has been essentially ignored in the analyses of the results. Few studies have included both a simultaneous and a sequential bilingual group in the same study with children with SLI. Armon-Lotem et al. (2008) observed that the children who scored below the cutoff on either the Hebrew or the English standardized tests were sequential bilinguals, except for two in the group with low Hebrew scores who were "very early" sequential bilinguals (AoO = 1;6). Three out of the six children who scored above the cutoff on both tests were simultaneous and the remaining three were sequential bilinguals. Therefore, future studies could include groups of L2 children who vary in AoO to observe potential effects of this variable on the comparison with SLI.

As Marinis & Chondrogianni (2010) noted and as the child L2 studies reviewed here have shown, most of the research on verb morphology in child L2 English has looked at children whose length of exposure was generally less than 3 years. Marinis & Chondrogianni (2010) showed that L2 children converge on TD norms after about 4 years of exposure. Furthermore, Paradis's (2008) study showed that TD L2 children as a group began to perform better than the SLI after two years exposure and began to close in on the TD scores after 3 years. Considering Marinis & Chondrogianni's (2010) and Paradis' (2008) results, LoE beyond 3-4 years seems to have the potential to differentiate the TD L2 children from the monolingual SLI in verb morphology in English. Concerning the group studies of object clitics and gender in French, only L2 children with less than 2 years exposure were studied and the length of exposure was the same across children, which did not allow for the study of an LoE effect. In Orgassa’s (2009) study (almost identical to Orgassa & Weerman (2008)) on gender agreement in Dutch, the TD L2 children had 3;3 to 8;5 years of exposure to the L2 (*M* = 5;3, *SD* = 1.3), but LoE was not correlated with correct gender agreement on adjectives or determiners. Furthermore, the TD L2 group did not perform better than the L1-SLI for this property. However, in Orgassa’s (2009) study on finite verb inflection in Dutch, target-like performance was correlated with LoE in the TD L2 group (LoE range = 3;4 – 7;7) and these unimpaired L2ers also performed significantly higher than the L1-SLI for correct verb inflection.

Furthermore, as was mentioned previously, most of the direct L2-SLI comparisons involve the examination of the L2 of the bilingual group(s). However, assessing a child's abilities in the L1 provides important information about the possibility of language impairment in a child who systematically uses two languages. An L2 child with SLI will experience difficulties and delays in both languages. Unfortunately, it is often not possible to reliably assess the L1 because few or no speech-language pathologists in the child's community speak the child's L1 and/or because no standardized tests exist for the L1 in question. Because of this, researchers recognize the need to design other tools which would allow for a reliable assessment of the child's language background. For example, Paradis, Emmerzael & Duncan (2010b) reported on the results of a parental questionnaire which was designed to help in the identification of children at risk for language impairment. The questionnaire targeted four main themes: 1) Early milestones, 2) Current L1 Abilities, 3) Behavior patterns and activity preferences, and 4) Family history. A discriminant function analysis using scores from the questionnaire had good specificity, but poor sensitivity. Crucially, however, parental rating of the L1 discriminated between the affected and TD children. This result suggests that evaluating the L1 via parental rating can help distinguish between TD and impaired development in L2 children, even in the context of L1 attrition. This finding suggests that parental questionnaires of this type are helpful is discriminating between impaired and TD L1 language development in L2 children.

4.6 Conclusion

The goal of this chapter was to review the existing literature on the comparison of SLI and L2 children. The bulk of the studies reviewed here have, for the most part, revealed striking similarities between TD L2 children and children with SLI. However, there remain several gaps to fill in the literature on the comparison of these two populations. For example, many of these studied compared younger children with rather low LoE. There is also a dearth of longitudinal research available on these children.

A major methodological dilemma associated with these studies is the (mis)diagnosis of SLI in the affected bilingual groups. Because there is very little consensus about diagnosing SLI in bilinguals, it is possible that some of the children with the label L2-SLI in these studies were wrongly diagnosed as having a language impairment when their profiles in both languages are a reflection of typically-developing bilingualism. It is also possible that there were L2 children with SLI in the TD L2 group who had not been identified as impaired. This highlights the importance of better understanding typical L2 child development, so as to distinguish it from atypical L2 child development.

Many of studies cited here have contributed to the theoretical question of how to account for bilingual SLI and to the debate on whether the locus of the impairment in SLI is in the language module or in non-linguistic cognition. Following Peets & Bialystok (2010) and Paradis et al. (2005/2006), it seems that adopting an integrated approach that includes assumptions from both of these hypotheses may lead to interesting results moving forward. The DCH (Jakubowicz 2004) is an approach which takes into account the fact that certain linguistic properties are associated with difficulty in acquisition as well as the fact that children in certain acquisition contexts are constrained by limited processing resources. The operationalization of the DCH to the current study as well as the relevant linguistic analyses will be explored in the following chapter.

5 A Way Forward for the SLI-L2 Comparison

5.1 Introduction

This chapter is divided into two parts. Sections 5.2-5.4 discuss theoretical points that will be considered as background for the current study. In Section 5.2, the general objectives of this thesis will be presented. Next, in Section 5.3, some of the questions raised by the representational versus processing debate, which was at the heart of many of the studies presented in the earlier chapters, will be discussed further here. I will argue in favor of the use of what I referred to in Chapter 3 as an integrated theoretical approach as background for SLI-L2 comparisons. Furthermore, I will argue that the analysis of clausal embedding and the distribution of errors in spontaneous speech in L2 and SLI populations is one way in which an integrated approach can be operationalized. In Section 5.4, the hypotheses and predictions of the current study will be described.

Section 5.5 will present linguistic analyses of embedded clauses in French and in English, as well as a comparison of verb morphology, object clitics, and grammatical gender in the grammars of French and English. The analyses presented in these sections serve as a linguistic basis for the study of clausal embedding and the aforementioned morphosyntactic properties.

5.2 General SLI-L2 Research Agenda

The focus of this thesis is on the comparison of children acquiring a second language (L2 children) and monolingual children with specific language impairment (SLI). Particular attention will be paid to the L2 population in order to contribute to the existing knowledge about how L2 acquisition proceeds in children. As discussed in earlier chapters, recent research has emphasized the importance of identifying characteristics that are unique to one of these groups and which would therefore allow clinicians to more accurately distinguish between a child who is acquiring an L2 typically and a L2 child with language impairment. Initial studies comparing these two populations revealed consistent similarities between monolingual children with SLI and typical and impaired bilinguals. Because of the lack of information concerning what typical L2 development looks like, these learners are at risk for what Cummins (1994, 2000) and Paradis (2005) term mistaken identity and missed identity, which refer respectively to cases in which clinicians and educators misidentify a typical L2 child as having a language impairment (the former) or attribute language difficulties in an impaired child to the second language development context (the latter). In response to this clinical reality, more knowledge is needed about unimpaired child L2 developmental trajectories. Better knowledge of this developmental context could potentially lead to the development of diagnostic tools that are sensitive to the effects of typical L2 development compared to impaired L2 development on language performance.

Much of the previous research on child L2 acquisition has focused on early developmental sequences, the status of functional categories, and the role of L1 transfer. Very few studies have examined the impact that computational complexity has on this developmental context. Therefore, relatively little is known about how arguably more complex structures, such as those with wh-movement and/or embedded clauses, develop in L2 children. On the other hand, as seen in Chapter 3, a considerable number of studies have reported that children with SLI have difficulty with clausal embedding and wh-movement. These difficulties are observable through avoidance strategies and whether or not the structure contains errors in morphosyntax (Tuller et al. 2012; Hamann et al. 2007).

Furthermore, the previous three chapters have highlighted the overlap in the morphosyntactic performance of L2 children and children with SLI. Research on French has shown that both children with SLI and L2 children use verb morphology, object clitics, and grammatical gender in a way that differs from their TD monolingual peers. As seen in Chapter 3, studies on SLI have reported that morphosyntactic errors occurred more frequently in utterances with wh-movement and/or those containing an embedded clause compared to monoclausal utterances (e.g., Tuller et al. 2012; Prévost et al. 2011; Gillam & Johnston 1992) and in utterances with (di)transitive verbs compared to intransitive verbs (Pizzioli & Schelstraete 2008; Simon-Cereijido & Gutiérrez-Clellen 2007). These authors argue that these arguably more complex structures involve an increased processing cost, thereby creating a situation in which morphosyntactic errors (e.g., object omission) are more likely to occur. The idea is that if too many resources are allocated towards structure building, the remaining resources are not sufficient for the production of target morphological forms.

Given the above research imperatives and gaps in the literature, the overall objectives of the present study are as follows: **(1) Contribute to knowledge concerning the development trajectory of typical L2 acquisition in children, and thereby, (2) contribute to the larger research agenda which aims to disentangle the effects of bilingualism from the effects of**

SLI on language development. A third goal (3) is to examine the impact that complexity has on L2 child development, i.e., to what extent sensitivity to computational complexity is a normal part of L2 development.

5.3 Summary of Theoretical Approaches

In this section, theoretical points and questions that were raised in the first four chapters will be revisited. The overall goal of this section is to compare and contrast the theoretical approaches often adopted in the L2 literature to the ones from the SLI literature. So far, evidence from the L2, SLI, and L2-SLI comparative literature reveals that children from both groups have very similar performance with respect to the morphosyntactic properties that have been studied so far. Furthermore, it seems that neither L2 children nor children with SLI consistently "outgrow" these difficulties with age or language exposure. This section reviews theoretical proposals that attempt to account for these patterns.

After reviewing theoretical proposals, I will argue that the investigation of clausal embedding fills a hole in the L2-SLI comparative research and that the link between clausal embedding and greater processing demands is also theoretically interesting to explore from an L2 perspective.

5.3.1 Processing versus Representational Debate

As seen in Chapter 3, in the SLI literature, much attention has been paid to the debate between so-called "domain-general" and "domain-specific" approaches (see Paradis 2010 for a review). According to the domain-general processing account of SLI, affected children's difficulty with language is a result of either a combination of processing limitations and the acoustic properties of certain linguistic elements (Leonard 1998), a problem with limitations in phonological working memory (Gathercole & Baddeley 1990, 1993), or generalized slow processing speed (Kail 1994). These approaches generally predict that children with SLI will need longer exposure (more input) to certain non-salient linguistic elements before being able to derive the grammatical rules from the input (Orgassa 2009; Paradis 2010; Leonard 1998). From a so-called domain-specific or representational point of view, children with SLI have grammars with some sort of impairment (e.g., Agree or checking operations are impaired). This type of approach generally predicts that children with SLI will have difficulty with the specific morphosyntactic properties that these operations underlie, such as subject-verb agreement and tense marking.

Recall from Chapter 2 that in the child L2 literature, one family of theoretical approaches attempts to account for the variable use of target surface morphology in L2 learners by assuming that underlying grammatical representations are impaired in L2 acquisition (e.g. Minimal Trees Hypothesis: Vainikka & Young-Scholten, 1994, 1996a, 1996b; Valueless Features Hypothesis: Eubank 1993/1994; Failed Functional Features Hypothesis: Hawkins & Chan 1997), while other accounts assume that grammatical representations are intact and processing issues can explain non-target forms (Truncation and MSIH, Prévost & White 2000). As pointed out by Grüter (2005), this debate is somewhat parallel to what was mentioned above in the SLI literature.

However, it seems that the major difference between the debate about processing and representation in the L2 literature compared to the very similar debate in the SLI literature is the degree to which the linguistic system is involved in the processing viewpoint on each side. Both families of L2 approaches base their predictions on language-specific notions such as the status of functional categories or the cost associated with linguistic operations; whereas, the SLI processing accounts assume that the locus of the deficit is in non-linguistic cognitive abilities with consequences for grammatical representations (Paradis 2010). The processing viewpoint in SLI supposes that non-linguistic cognitive processing systems are mainly responsible for the language deficits observed in this population; whereas, the processing viewpoint in L2 assumes that processing demands associated with a specific linguistic function (e.g., retrieval and mapping of morphological forms onto syntactic features) can explain differences between abstract functional features and surface morphology.

As shown above and in earlier chapters, the MSIH, which posits that processing demands can lead to difficulty accessing target morphological forms from the lexicon, has received considerable attention in the L2 literature (adult and child). The idea is that target morphological forms may be successfully acquired (i.e., stored in the lexicon), but they can be costly to access. In adult native speakers, this retrieval is highly automatic and therefore involves very little processing cost. However, this is not the case for L2 learners. According to the MSIH, long-lasting issues with non-target surface morphology in L2 adults and children (e.g., tense marking in L2 English) are due to difficulties (i.e., the processing cost) associated with mapping the target morphological form from the lexicon onto the underlying syntactic representation (White 2003).

The MSIH's assumptions related to processing raise the question of how L2 children process language compared to monolingual children and children with SLI. The study of how L2 children process language on-line is a relatively recent research endeavor (see Sekerina et al. 2008 for a review of on-line methods adapted for children) and therefore little is known about how L2 children process language in real time. Marinis (2007) showed that although L2 children process passives slower than L1 children, both groups displayed sensitivity (i.e., relatively longer reaction times) to the morphological markers that disambiguate passive from active interpretations. In reaction time studies, L2 adults and children have been shown to process linguistic stimuli in a generally slower fashion than their TD monolingual counterparts (Clahsen & Felser 2006; Dekydtspotter et al. 2006; Kohnert et al. 2009). Kohnert et al. (2009) showed that L2 children were slower than L1 children in both linguistically-mediated and language tasks (e.g., non-word repetition, digit spans and lexical recognition tasks), even after considerable exposure to the L2; however, they tended to have higher performance on non-linguistically-mediated tasks than the SLI. Extrapolating from these results, one would imagine that L2 children have higher processing demands during language production (i.e., spontaneous language or elicited production tasks) compared to L1 children. This processing component should therefore be taken into account in theoretical approaches to child L2 acquisition.

However, the MSIH account makes no predictions about what specific (linguistic) contexts might increase processing demands in L2 learners. If processing demands are in fact assumed to play an integral role in L2 performance patterns, then the use of target surface morphology should be more variable when processing resources are stretched. In other words, if a given syntactic structure is known to increase processing demands in other populations, then morphological errors should also be made more frequently by L2 learners in such a structure. Recall from Chapter 4 that few studies have attempted a priori to answer this specific question for L2 child learners (Prévost et al. 2011; Simon-Cereijido & Gutiérrez-Clellen 2007), although studies have relied on the notion of computational complexity as a post hoc explanation to findings in their data (e.g. Ionin & Wexler 2002).

5.3.2 Question of L1 Transfer

The different L2 theoretical approaches mentioned above (MSIH: Prévost & White 2000; Minimal Trees Hypothesis: Vainikka & Young-Scholten, 1994, 1996a, 1996b; Valueless Features Hypothesis: Eubank 1993/1994; Failed Functional Features Hypothesis: Hawkins &

Chan 1997) make different assumptions about the role of L1 transfer (see Chapter 2). Although L1 transfer effects have been documented in L2 children (Unsworth 2005, Haznedar 2003), there is little understanding as to where exactly transfer effects should be observable in L2 language performance. Certain widely documented errors such as object clitic and tense omission are often interpreted as being developmental in nature, given that similar errors are found in TD L1 acquisition. Certain non-target forms that could be attributed to L1 transfer, such as object clitic placement errors in the early stages of L2 French by German and English L1 speakers, are quite rare. English-speaking children make gender errors in French and Dutch, which appears to be evidence for transfer effects. However, Dutch-French and Swedish-French simultaneous and sequential bilinguals also have been shown to make gender errors in French and Dutch (Granfeldt et al. 2007; Hulk 2007), which suggests that having a grammatical gender distinction in the L1 does not guarantee quick or error-free acquisition of grammatical gender in the L2.

Furthermore, English-speaking children learning French as an L2 tend to avoid wh-fronting in questions, even though this interrogative type is required in English (Prévost et al. 2010). This particular finding addresses the question of the effects of complexity and L1 transfer in L2 acquisition. Do L2ers prefer using constructions in the L2 that imply the same word order as the L1 or those that differ from the L1 but entail fewer movement operations? Moreover, Unsworth's (2005) work on scrambling in L2 Dutch by English-speakers revealed evidence for L1 transfer in early stages as measured by elicited production. Her results showed that those with higher proficiency in Dutch showed fewer L1 transfer effects. However, in certain comprehension tasks, chronological age appeared to trump transfer and proficiency effects in the L2 group. Indeed, older participants were more likely to perform well in comprehension due to pragmatic knowledge that is acquired only after a certain age.

In sum, there is evidence for L1 transfer in L2 children. Transfer effects in L2 children suggest that the linguistic component should be taken into account when studying L2 children and when comparing them with children with SLI. Schwartz and Sprouse's (1996) Full Transfer Full Access model argues that the L1 grammar constitutes the blueprint for L2 acquisition. Granfeldt et al. (2007) have also argued that "functional categories (and therefore the essential syntactic structure) is accessible to L2 learners by virtue of their first language" (p. 35). However, as we have seen, it is difficult to predict exactly how transfer effects will manifest themselves in language performance. What seems to be the case is that L2 children and adults use the L1 in some aspects of L2 acquisition. The picture that emerges from the recent child L2 literature is that additional factors such as chronological age and the involvement of operations such as wh-movement can sometimes have a greater observable impact for a given construction on L2 acquisition than L1 transfer. Therefore, it seems important, if one is to characterize how L2 acquisition proceeds, to better understand how L1 transfer interacts with other factors in acquisition, such as age and complexity effects.

5.3.3 Integrated Approaches

The preceding discussion leads to the conclusion that L1 transfer and processing limitations need to be taken into account when studying L2 acquisition. Moreover, it has been pointed out by various researchers that both processing and representation contribute to patterns in (a)typical language development (Paradis et al. (2005/2006); Peets & Bialystok 2010). Therefore, it seems that adopting an approach that integrates both processing and abstract grammatical components may account for a wider range of phenomena in both L2 and SLI populations.

Some studies in the SLI literature have adopted approaches that combine both processing and representational elements (Jakubowicz 2011; Tuller et al. 2012; Tuller & Hamann 2010; Pizzioli & Schelstraete 2008; Simon-Cereijido & Gutiérrez-Clellen 2007). The general approach adopted in these studies involves the comparison of a syntactic structure that is arguably more complex in nature compared to another. The prediction is that more complex structures will be more difficult because they overload processing resources in children with SLI. A more complex derivation is associated with a higher processing load, which increases the likelihood of errors being made or of avoidance strategies being adopted. Although these studies differ in the way that complexity is defined, they all seem to point to the basic idea that the nature of the derivation of a specific structure can overload processing capacity in children with SLI more easily than TD children. In other words, the pressure put on the computational system in terms of the number and nature of operations involved in a given derivation can overwhelm processing resources in children with SLI. This interaction between derivational complexity and processing resources involves both linguistic representation and processing capacity issues.

Simon-Cereijido & Gutiérrez-Clellen (2007) and Pizzioli & Schelstraete (2008) showed that children with SLI who avoided ditransitive verbs made fewer morphosyntactic errors than those who produced more. The authors account for these results by assuming a positive correlation between complexity and the number of arguments required by a particular verb. Pizzioli & Schelstraete (2008) specify that previous psycholinguistic data support the claim that argument complexity is linked to greater cognitive demands. They argue that accessing a verb with multiple arguments increases the quantity of information that must be activated, which consequently increases the computational load. Computational load can also be heightened by multiple verb arguments because a greater number of thematic roles must be considered and mapped onto syntactic roles. Therefore, as the number of verb arguments (and therefore complexity) increases, the higher the processing cost is, which leads to a higher number of errors.

Tuller et al. (2012) examined the frequency of use of complex (multiclausal) utterances in children with SLI. Following Jakubowicz's Derivational Complexity Hypothesis (DCH), the prediction was that children with SLI would use complex utterances less frequently compared to TD children in order to alleviate processing demands. The definition of complexity adopted in this study concerned the depth of embedding (i.e., complexity increases with the depth of clausal embedding) and the number of operations involved in a derivation (internal and external merge as well as the feature calculations involved in agreement and the identification of interveners in terms of Relativized Minimality). Using this definition, sentences with embedded clauses are more complex than monoclausal or coordinated utterances. Furthermore, certain types of embedded clauses (e.g., finite complement clauses) were argued to be more complex than others (e.g., non-finite complement clauses). As seen in Chapter 3, the results showed that the individuals with SLI produced fewer embedded clauses than their TD peers and that the frequency of embedding did not increase with age, unlike what is observed in TD children across different age groups (see Loban 1976, among others).

Tuller & Hamann (2010) analyzed various types of relative clauses in the spontaneous language of French-speaking children with SLI. Compared to complement clauses, relative clauses contain additional operations that are assumed to translate into higher processing demands. The focus of this study was the contribution of depth of embedding and the nature of intervening elements within a syntactic dependency to the notion of complexity.

To support the idea that embedding is a key factor in the notion of complexity, Tuller & Hamann (2010) refer to examples from the adult processing literature (e.g., Gibson 1998) which have demonstrated that multiple embedded structures (especially center-embedded) can intensify processing difficulty (compare 39a and 39b).

(39) a. The nurse supervised the intern who had bothered the administrator who lost the medical reports.

b. The administrator who the intern who the nurse supervised had bothered lost the medical reports.

(Gibson 1998)

Tuller & Hamann also refer to recent work by Friedmann et al. (2009) on the syntactic differences between subject (40a) and object relative clauses (40b) as an explanation for the well-documented dissociation in developmental sequences between these two structures. Adopting an analysis based on intervener types (in the sense of Relativized Minimality, Rizzi 1990, 2002), object relative clauses are interpreted as being more computationally demanding because the features of the intervener (i.e., the SN appearing between the gap and the head of the relative clause that could potentially be an antecedent for the gap) must be calculated in order to arrive at the correct interpretation. In the search for the object of *hug* in 40b, the intervener "*the girl*" must be considered, but then rejected as a candidate. According to Friedmann et al. (2009), this feature calculation is associated with a processing cost that exceeds the capacities of young children and, in the view of Tuller & Hamann (2010), is predicted to pose long-lasting difficulties in (older) children with SLI. Such difficulties can be observed through higher error rates and avoidance strategies. Indeed, their results showed that the children with SLI in their study produced erroneous relative clauses about 25% of the time (compared to less than 10% for TD 6- and 8-year-olds). Furthermore, clear avoidance strategies (i.e., interruption of a relative or juxtaposition of two clauses) were used by the SLI group in nearly 25% of contexts where a relative clause was expected (compared to under 7% of the time in the TD groups).

(40) a. The man is watching the boy who/that___is hugging the girl.

b. The man is watching the boy who/that the girl is hugging_____.

(Tuller & Hamann 2010)

The findings of the studies described in this section (i.e., higher erroneous complex utterances in children with SLI compared to TD children, avoidance strategies) demonstrate the relevance of the link between the nature of grammatical operations and processing resources required by the computational system in atypical language development. Because of the demonstrated overlap in morphosyntactic accuracy in both children with SLI and L2 children, it seems that future approaches should go beyond simply reporting accuracy rates towards an examination of the link between complexity and language performance. An examination of clausal embedding, an arguably complex structure, and its potential link to error frequency provides an opportunity to investigate any potential differences in complexity and error distribution in children with SLI and L2 children.

5.3.4 Clausal embedding in L2 Children

As described earlier, much of the recent research in L2 acquisition has centered around the debate on the status of functional categories in L2 grammars. Evidence in the literature appears to support the hypothesis that they are present from the earliest stages of L2 acquisition (Grondin & White 1996; Haznedar 2003, Belletti & Hamann 2004). Recall from Chapter 2 (Section 2.3.4) that studies such as Haznedar (2003), Lakshmanan & Selinker (1994) and Gavruseva & Lardiere (1996), which were focused the emergence of CP, showed that utterances involving clausal embedding appeared relatively early in L2 child acquisition. Furthermore, clausal embedding was observed frequently before the mastery of certain morphosyntactic properties. For example, as Haznedar (2003) pointed out, CP emerges in L2 children learning English well before inflectional properties were mastered. Recall that Belletti & Hamann (2004) reported that the L2 child Elisa used clausal embedding at an age-appropriate frequency in relatively early stages of L2 development. Pearson’s (2002) study of complex syntax in the narratives of bilingual children in Miami showed that these children caught up to their monolingual peers by the 5th grade, whereas their morphosyntactic accuracy was still significantly lower than the monolinguals in 5th grade. Overall, relatively little is known about how clausal embedding develops in L2 children. However, the evidence so far suggests that embedded structures emerge relatively early and are used frequently, which would tend to support the idea that subordination in the L2 is not particularly difficult for L2 children.

Interestingly, this apparent early emergence of subordinate clauses in L2 children is in contrast to what has been observed for children with SLI. As was discussed in Chapter 3 and reviewed in Section 3.4.3.2, Tuller et al. (2012) and Tuller & Hamann (2010) showed children with SLI avoid subordination. Evidence also suggests that subordinate clauses emerge later in children with SLI compared to TD children of the same age (Owen & Leonard 2006).

Therefore, it seems that the study of subordination provides an opportunity to explore potential differences between these two groups.

I think that the investigation of clausal embedding could potentially respond to the research objectives outlined in Section 5.2. First, there appears to be a difference concerning the frequency and facility with which L2 children and children with SLI acquire clausal embedding. Furthermore, clausal embedding is often argued to be more complex and therefore involves a higher processing cost than utterances without embedding. Looking at embedding will therefore allow for a comparison of how these two groups cope with processing costs. Following the studies cited above and in Chapter 3 (e.g., Tuller et al. 2012; Tuller & Hamann 2010), I also propose to explore the link between error rates and complexity. Embedded clauses in French and English have the same basic underlying structure; therefore, difficulty in subordination by the L2ers could not easily be explained by interference from the L1; however, the early emergence of subordinate clauses can be taken as evidence for the access to syntactic operations via the L1. Lastly, the study of subordination in L2 children fills a hole in the generative approach to child L2 acquisition literature and will provide an opportunity to contribute to the characterization of the developmental trajectory in this acquisition context.

5.4 Research Questions, Hypotheses and Predictions

As was mentioned in the above discussion, one domain that has not yet been explored in child L2 acquisition is clausal embedding. The slim evidence from the child L2 literature suggests that embedded clauses do not present a high level of difficulty for these learners. Interestingly, as reviewed in Chapter 3, there is growing research in the SLI literature documenting the difficulties that these learners have with clausal embedding compared to TD children. Previous research on SLI has generally assumed that utterances containing an embedded clause are more complex than monoclausal utterances, which translates into a higher processing load that can exceed the capacities of children with SLI.

Earlier in this chapter I argued for the incorporation of aspects of both domain-general and domain-specific (or, processing and representational) approaches in the study of L2 and SLI. Given that both representation and processing are key components to language acquisition and that isolating these two approaches does not successfully account for patterns observed in either of these acquisition contexts, it seems that a more fruitful approach would attempt to understand how the computational and processing systems interact in these learners. Furthermore, previous research indicates that the use of an independent measure of complexity, which can be used to characterize how the computational system is expected to interact with the processing system, may lead to a better understanding of what is common to syntactic structures that are often qualified as “difficult” in (a)typical acquisition. This is turn may lead to a more precise characterization of how L1 transfer and processing factors interact in L2 acquisition. For example, if embedded clauses emerge relatively early in L2 child acquisition, whereas they emerge later in L1 acquisition and create obstacles in children with SLI, then it could be inferred that L2 children transfer the capacity to use subordination in the L1 and the L2 and that consequently, the processing demands involved in these derivations is relatively low in L2 child acquisition. It seems to me that the study of the direct comparison of L2-SLI should attempt to take the interaction of the computational and processing systems as well as the role of L1 transfer into account. Given the difficulties that children with SLI have with complexity and processing limitations and that L2 children are inevitably influenced by their L1 to some degree, understanding how L1 transfer and processing interact with the computational system in TD L2 acquisition could potentially lead to more accurate identification of SLI in bilingual children.

5.4.1 Objectives

Given the research imperative of finding ways of distinguishing typical and impaired bilinguals and the initial evidence from the literature that the development of clausal embedding may proceed quickly and without apparent difficulty in child L2 acquisition, the primary objective of this study is to compare the use of clausal embedding in monolingual French-speaking children with SLI and L2 children (L1 English). As discussed earlier, French and English have similar underlying structures with respect to embedded clauses and therefore difficulties with subordination observed in the L2 population would not be due to interference from the L1.

Because these groups have been shown to overlap in their performance on morphosyntactic properties such as verb morphology, object clitics, and grammatical gender, and because previous studies on SLI have shown that errors are more frequent in complex structures, a second main objective of this study is to examine the frequency and distribution of errors, with a particular focus on the aforementioned morphosyntactic properties.

5.4.2 Research Questions

The above discussions and observations lead us to the first research question: **What is the impact of computational complexity on child L2 development?** Can the characterization of the underlying role of computational complexity in L2 development help us to better differentiate L2 development from SLI? More precisely, what differences, if any, are there between child L2ers and children with SLI with respect to the development of complex structures, such as embedded clauses? Moreover, what is the relationship, if any, between the frequency of complex structures and errors in the spontaneous language of these children?

As we saw in Chapter 4, previous research comparing these populations has generally focused on children younger than 9 and on L2 children who have 2 years or less exposure to the L2. An additional objective in the present study is to extend the L2-SLI comparison to groups that include older children and L2 children with longer exposure and varying ages of acquisition. **The second research question therefore concerns whether the older L2 children and children with SLI pattern in the same way as younger children from the same populations.** In other words, do we find the same patterns between older children with SLI and age-matched L2 children with more exposure compared to previous research on younger groups with less exposure? Furthermore, do these similar patterns remain in effect after a period of 12 months?

In the L2 child literature, attempts have been made to account for the high variability in these learners through the study of the impact that factors such as chronological age, age of onset, length of exposure, L1 transfer and aptitude, and quantity and quality of input have on L2 performance. The results so far appear inconclusive, thus pointing to the need for more research on how these factors contribute to overall success in child L2 learners, who are an inherently heterogeneous group. The third research question therefore concerns the effects of these factors on the longitudinal L2 performance: **3. How do the factors listed above contribute to overall success in child L2 development? Are abilities in the L1 correlated with abilities in the L2?**

The fourth research question concerns the challenge of the heterogeneity of the SLI and L2 groups, even when the aforementioned factors are similar across learners. I assume, as do Paradis et al. (2011), that there are different healthy developmental paths possible in child L2 acquisition. In order to correctly diagnose L2 children with language impairment, clinicians must be able to distinguish a healthy path from an impaired one. **4. The fourth question is, therefore, whether the analysis of measures such as rate of subordination and error analyses, as well as the comparison with children with SLI can contribute to the delineation of healthy and impaired child L2 developmental trajectories.**

In order to attempt to answer the above research questions, a longitudinal comparison was carried out between a group of children with SLI (aged 6;5-12;11; *M* = 9;9, *SD* = 1;11) and a group of native English-speaking children (aged 6;9-12;7; *M* = 9;8, *SD* = 1;9) who began acquiring French between the ages of 4 and 10 and who had been exposed to French for 0;11-4;0 years at the onset of testing. Standardized tests in both French and English (for the L2 group) were used to independently assess the participants' language abilities. Spontaneous language samples were coded for clausal embedding (number and type) and morphosyntactic accuracy. Error analyses were also undertaken in order to examine whether sentences with clausal embedding tended to be more frequently erroneous compared to those without embedding. Furthermore, morphosyntactic accuracy related to verb morphology, object clitics and grammatical gender was analyzed in more detail in order to compare with previous research on these same properties. A family questionnaire was also used to collect information about the child's use of the L1 and L2 outside of school.

5.4.3 General Hypothesis and Predictions

Following Schwartz & Sprouse (1996), I will adopt the general hypothesis that transfer of L1 properties occurs in L2 child grammars. More specifically, for the purpose of this study, I hypothesize that L2 children begin L2 acquisition with syntactic knowledge of clausal embedding thanks to their typical L1 acquisition.

As discussed above, prior work on L2 children suggests that embedded clauses emerge relatively early and are used frequently in L2 child development. Early emergence and frequency are two criteria that are often argued to indicate relative ease and a solid mastery of a given structure type. If the syntactic operations that underlie embedding are available to the L2 child by virtue of their L1, then L2ers should not need to re-acquire the entire structure during L2 development. This hypothesis also predicts that clausal embedding will be relatively less demanding in terms of cognitive resources in the L2 population compared to the SLI. The assumption is that language skills that transfer from the L1 are already fairly automatic, and consequently, easier to use. This automaticity means that more resources are freed up to process other information (Gass & Selinker 2001, p. 209-210). With this in mind, I would like to test the following two predictions:

Prediction 1: Unimpaired L2ers, who are assumed to have healthy computational systems, should produce embedded clauses at a rate that is appropriate for their chronological age.

Prediction 2: If in fact a large majority of individual L2 children perform more closely to the TD groups, then those L2 children who produce embedded clauses at the same rate as the SLI should be considered for language impairment.

Moreover, previous studies have shown that morphosyntactic errors tend to occur more frequently in complex structures. I expect this to be the case for both the L2 and the SLI. In other words, sentences with clausal embedding should be more prone to error than sentences without embedding in both groups. However, if in fact the L2 children do not have any particular difficulty with clausal embedding, then processing resources should be stretched to a lesser degree compared to the SLI. If L2 children use fewer processing resources than the SLI in the production of clausal embedding, then the L2ers could potentially dedicate more resources to target surface morphology, making errors less likely. It follows then that error distribution would be expected to be somewhat different in the L2 children compared to the children with SLI. Put more simply, the idea is that complex structures stretch the processing capacity of children with SLI to a greater degree than the L2 children. This brings us to the third prediction:

Prediction 3: L2 children are predicted to have a lower rate of erroneous multiclausal utterances compared to the SLI.

It seems to me that the general hypothesis does not allow for precise predictions about overall morphosyntactic accuracy or accuracy in terms of verb morphology, object clitics and gender agreement in these groups. Judging from the trends discussed in the research on SLI and L2, neither of these groups has been shown to consistently have targetlike performance for these properties. Therefore, I leave the question open as to the impact of a wider age or LoE range in the SLI and L2 groups (in comparison to previous comparative studies) on morphosyntactic performance.

Summarizing, the first part of this chapter was dedicated to theoretical considerations in the SLI-L2 comparison. The second part of this chapter presents the general characteristics of

French embedded clauses, verb morphology, object clitic system, and grammatical gender system. These analyses will be used as a basis for testing the predictions spelled out above. In addition, differences between French and English with respect to these properties will be highlighted.

5.5 Clausal Embedding and Verb Morphology in French Compared to English

In the previous chapter, reasons were outlined for the study of clausal embedding and error distribution in the comparison of monolingual French-speaking children with SLI to L1 English children learning French as an L2. This chapter presents the types of embedded clauses and morphosyntactic properties of French under investigation in this study. In addition I will outline the reasoning behind the interest of including these specific structures.

5.5.1 Embedded Clauses

This section presents the underlying structures assumed for adverbial, complement and relative clauses in French. In addition, each structure will be compared to its equivalent in English. The characteristics that have been argued to increase the processing load involved in each structure will also be discussed.

5.5.1.1 Adverbial clauses

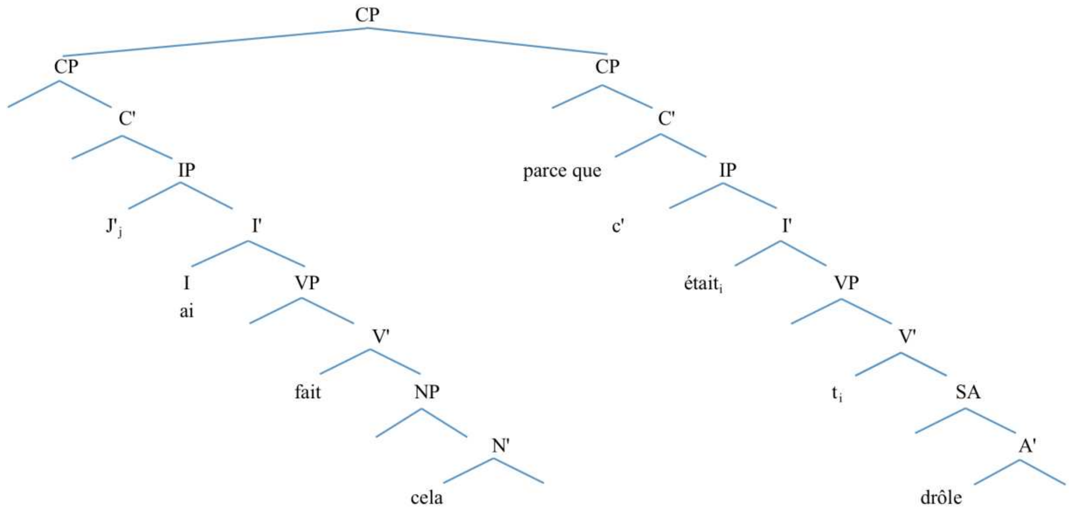
It will be assumed that adverbial clauses such as the ones listed below involve adjunction at the CP level of the matrix clause. As will be seen in later chapters, the children in this study mainly produced both finite adverbials like 41a and non-finite adverbials like 41b, which express a reason. Adverbials with the gerund verb form *–ant* (41c) did not occur frequently in the data and therefore will not be discussed at length. Adverbials are generally assumed to be less deeply embedded compared to complement clauses given that they are not arguments of the matrix verb, and thus not inside IP. It will be assumed that the subordinating conjunction that introduces the embedded clause occupies the head of C. (see representation in 41d).

(41) a. J'ai fait cela parce que c'était drôle.
I have done that because it was funny

b. J'ai fait cela pour m' amuser
I have done that COMP cl.REFL to-have fun

c. J’ai fait cela en rigolant
I have done that while laughing

d.



The same underlying structure is assumed for English. There are, however, different mood and tense types required by equivalent subordinate clauses in French compared to English. Differences in tense type can be found in some adverbial clauses that express a temporal relation (as in 42). Most notably, temporal adverbial clauses in French must agree in future tense with the matrix verb, whereas in English, the present tense is used.

(42) a. Quand je serai grand, je serai vétérinaire.
when I will-be big, I will-be veterinarian
‘when I’m older, I will be a veterinarian’

5.5.1.2 Non-finite complement clauses

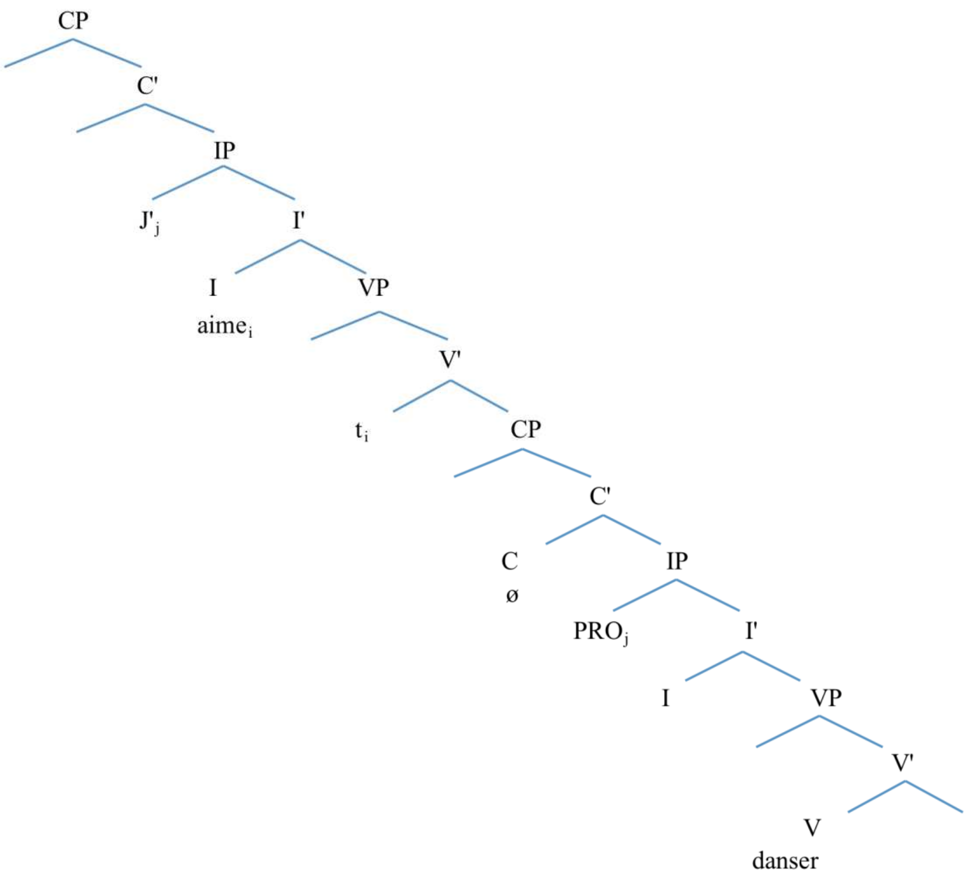
In non-finite complement clauses, French verbs select either null or overt complementizers (prepositional *à* ‘to’/*de* ‘of’) to introduce the embedded clause. Complementizer choice is part of the subcategorization requirement of the verb. Therefore, the form of these complementizers (*à*, *de* or null) must be learned and stored in the lexical entry for each verb. It will be assumed that structures in which a verb takes a non-finite complement clause are biclausal in nature and involve the embedding of an IP within a CP within an IP ([$_{IP}$ [$_{CP}$ [$_{IP}$]]]). PRO is posited to fill the subject position of the embedded non-finite clause (see 43d). However, when the verb is a modal, such as *pouvoir* ‘can’, *devoir* ‘must’ and *savoir* ‘know (how to)’, or so-called semi-auxiliary (*être en train de* ‘to be in the middle of’), the structure will be assumed to be monoclausal, since they cannot take a finite complement clause as an argument. Following this analysis leads to a more conservative estimate of the use of subordination. The differences in the nature of modals versus full lexical verbs are beyond the scope of this thesis, but the reader is referred to (Jones 1996) for more in-depth analysis for French.

(43) a. J’apprends à parler le japonais.
I learn COMP speak.INF the Japanese
‘I’m learning to speak Japanese’

b. Il a décidé de venir.
he has decided COMP come.INF

c. J’aime danser.
I like to dance

d.



Non-finite complement clauses are more deeply embedded than adverbial clauses; however, they are often considered to be less complex than finite complement clauses because the non-finite quality of the embedded clause means fewer operations involving tense choice and subject-verb agreement.

As with adverbials, the underlying structure of complement clauses is the same in French and English. Differences between these two systems involve the form and obligatory nature of the complementizer. As noted above, the complementizer that French verbs take must be learned individually for each verb and stored in the lexicon; whereas, in English the complementizer position is not realized phonetically in infinitival clauses.

5.5.1.3 Finite complement clauses

The analysis assumed for non-interrogative finite complement clauses is in (44).

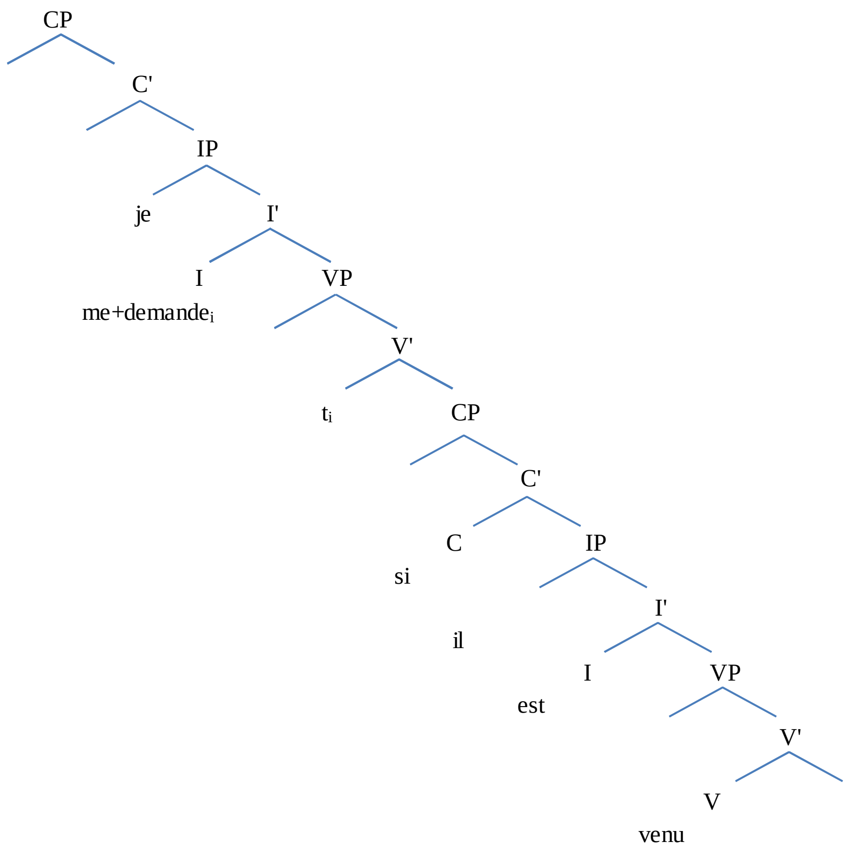
(44) [$_{IP}$ Je pense$_i$ [$_{VP}$ t$_i$ [$_{CP}$ qu' il viendra]]]
I think that he will come

In French declarative finite complement clauses, the verb selects the complementizer *que*, whose phonetic realization is almost always obligatory, except in certain cases with verbs such as *dire* 'say' and *croire* 'believe', and then only in some varieties of the spoken language. This is one major difference between French and English, seeing as the English complementizer *that* can usually be omitted in finite complement clauses. Putting aside the question of the obligatory nature of the complementizer, the underlying structures in French and English are the same.

In French embedded yes or no questions, the complementizer *si* occupies the head of C, as in the representation of 45a in 45b.

(45) a. Je me demande si il est venu.
I ACC.1P.SG wonder if he has come

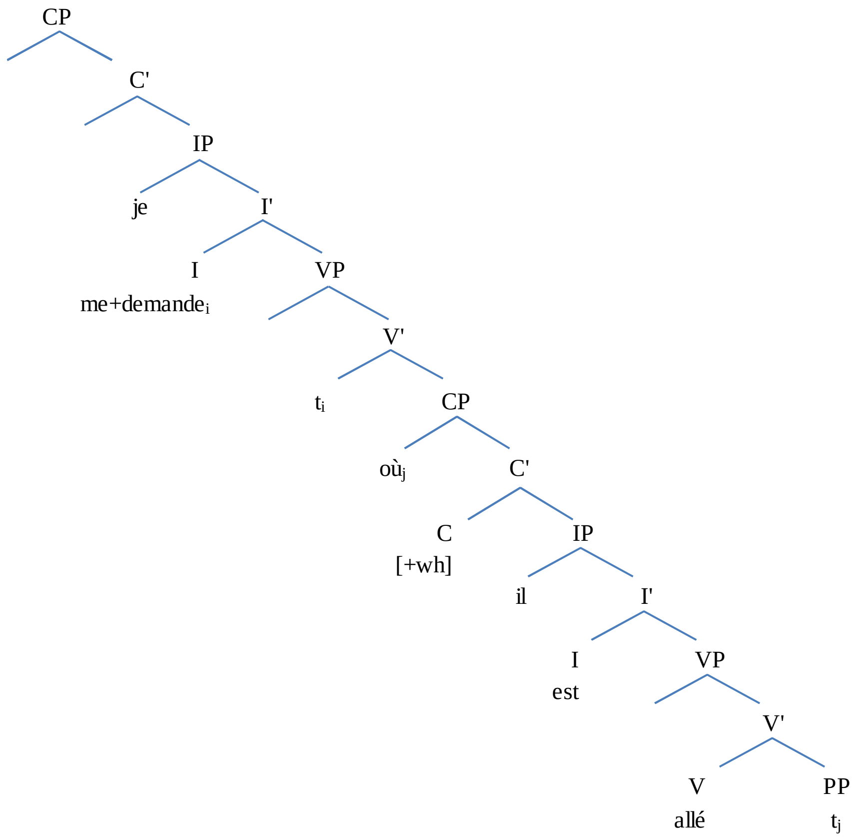
b.



In embedded wh-questions (or indirect questions) in French, such as 46a, wh-movement to the specifier of the embedded CP is obligatory in standard French (Prévost 2009), which is in contrast to matrix wh-questions in which the wh-word can remain in situ. However, certain dialects of French have been shown to allow the wh-word to remain in situ in indirect questions (see Oiry 2011). English has the same properties for indirect interrogatives, but does not allow in situ in embedded interrogatives (in any variety)

(46) a. Je me demande où il est allé.
I ACC.1P.SG wonder where he has gone

b.



An additional difference between English and French concerning finite complement clauses involves mood dependencies in the subordinate clause. In many varieties of spoken English, the subjunctive is no longer used. However, in French, certain matrix verbs require the use of the subjunctive in the embedded verb (as in 47).

(47) Je veux [$_{CP}$ que tu viennes]
I want that you come.SUBJUNCTIVE
'I want you to come'

5.5.1.4 Relative clauses

Compared to complement clauses, relative clauses contain additional operations that are assumed to translate into higher processing demands. Following Tuller & Hamann (2010), I will focus on how the notion of depth of embedding and the distance in the filler-gap dependency contribute to the notion of complexity.

As was seen above for complement and adverbial clauses, French and English are similar with respect to the underlying structure of relative clauses. As we will see here, differences between these two systems include constraints on complementizer suppliance and form and pied-piping.

In subject relative clauses, an in 48a (representation in 48g), it is generally assumed for languages such as English and French, that a null wh-operator is base generated in the subject position of the relative clause and undergoes movement to the specifier position of CP. The wh-operator is coindexed with its trace and the head of the relative clause.

In subject relative clauses in French, the complementizer *que* becomes *qui* after having entered into a specifier-head agreement relation with a wh-operator that is coindexed with a nominative trace. This so-called *que-qui* alternation is viewed as an expression of the complementizer's role as a subject (Rizzi 1990, Pesetsky 1982). In French subject relatives, the complementizer must take the form of *qui*, regardless of whether the antecedent is animate or not. English does not have a similar type of agreement expressed on the complementizer; however, like French, English requires either an overt complementizer or wh-operator in subject relatives. There are some restrictions on the form that the overt wh-operator can take in English subject relatives. For example, if the head of the subject relative is inanimate, the wh-word generally cannot be *who* (compare 48e and f). Whereas in English, subject relatives use either the complementizer 'that' or the wh-word 'who,' the only possibility for French subject relatives is the complementizer *qui*, which is homophonous with the wh-word (*qui* 'who').

(48) a. J’ai des amis qui viennent.
I have friends that come

b. I have friends who are coming.

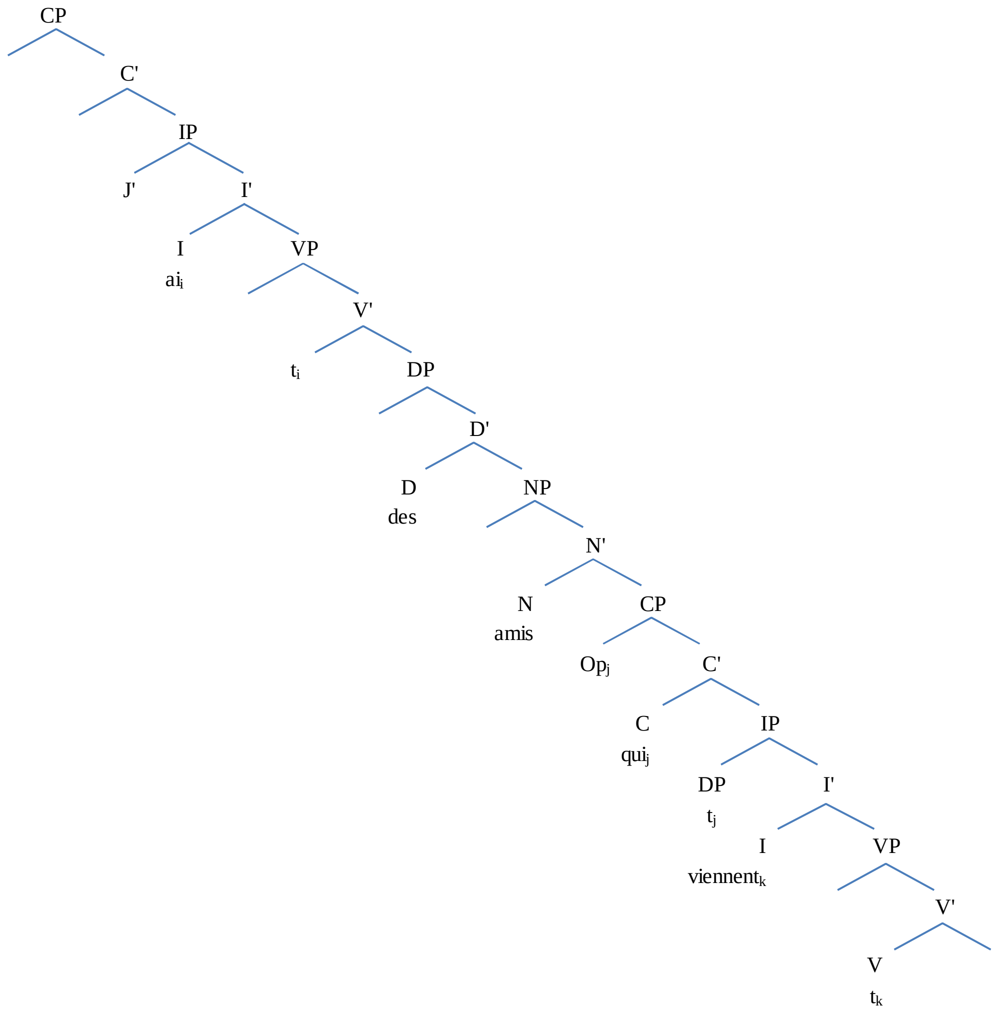
c. I have friends that are coming.

d. J’ai une voiture qui est rouge.

e. I have a car that is red

f. *I have a car who is red.

g.



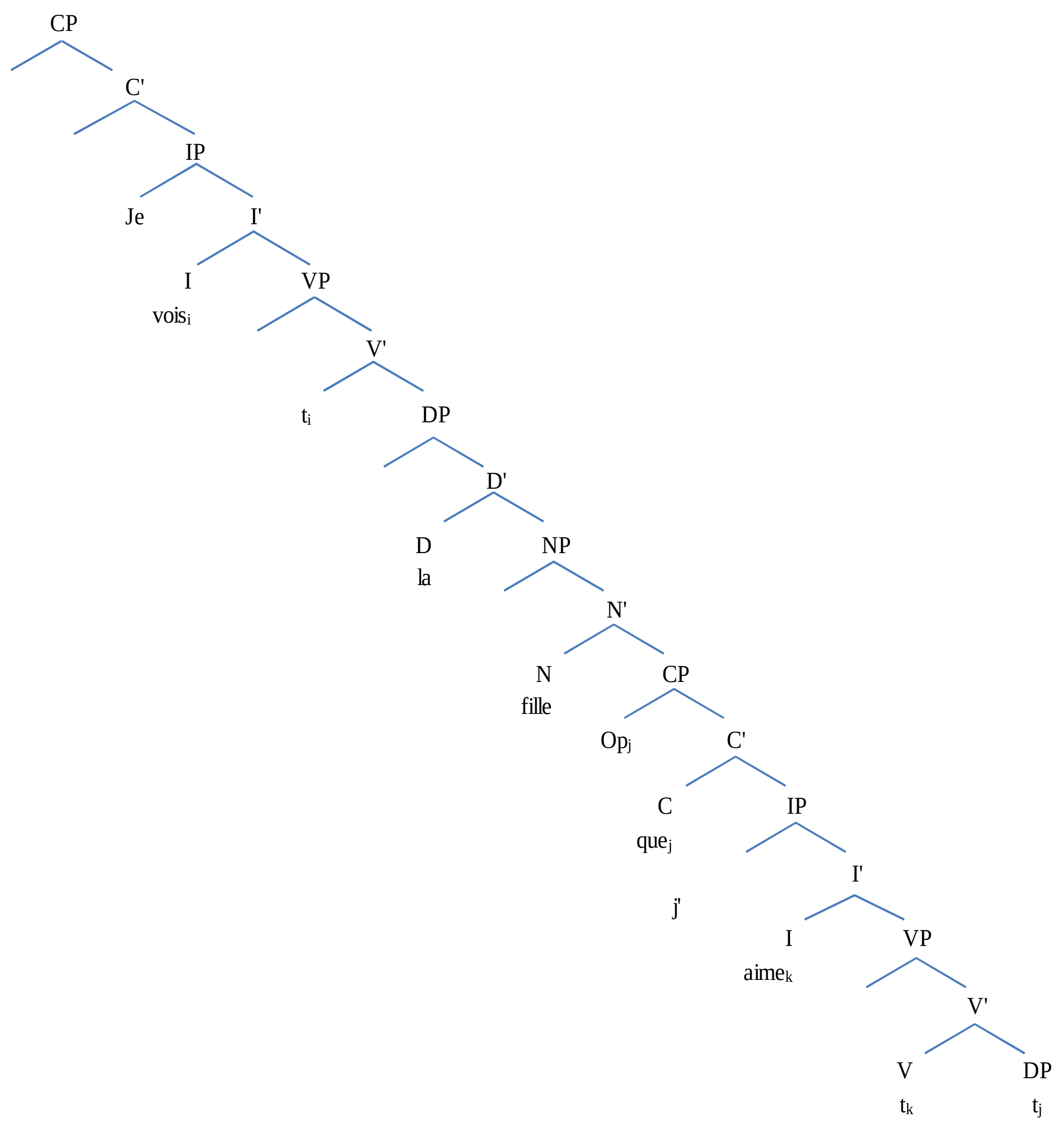
The analysis adopted for object relatives differs from subject relatives in that the wh-operator is generated in the object position of the relative clause VP (see 49a and its representation in 49d) instead of the subject position. Object extraction causes the distance between the head and the gap to be longer compared to that of subject relatives. Again, the underlying structure for French and English is the same, except that the complementizer cannot be omitted in French, whereas English has two options (compare 49b to its gloss in 49c).

(49) a. Je vois la fille que j’aime.
I see the girl that/who(m) I love

b. Je vois la fille *(que) j’aime.

c. I see the girl (that) I love.

d.



In non-finite relative clauses, the complementizer in French is *à* (see 50), whose presence is obligatory. As in the non-finite complement clauses, PRO is assumed to occupy the subject position in the embedded clause.

(50) J’$_j$ ai un truc [$_{CP}$ OP$_i$ [$_{c'}$ à$_i$ [$_{IP}$ PRO$_j$ faire t$_i$]]].
I have a thing COMP to do

In adjunct relative clauses (51-52), French and English each require an overt wh-operator; however, French requires pied-piping of the preposition and English allows preposition stranding (compare 52c to its gloss in 52d).

(51) a. Le café où j' ai vu Max est là-bas
b. The café where I have seen Max is over there

(52) a. la boîte dans laquelle je mets le stylo est rouge
b. the box in which I put the pen is red
c. *la boîte que je mets le stylo dans est rouge
d. the box that I put the pen in is red

As can be seen from the above discussion, relative clauses involve embedding and movement of a wh-operator. Object relatives have been argued to present added difficulties when compared to subject relatives because of the distance between the head and the gap and because of intervention effects (see Section 5.3.3). For these reasons, relative clauses are often argued to be more complex than adverbial or complement clauses. The underlying structures in English and French are very similar for these clause types; however, differences exist with respect to the availability and form of the complementizer.

5.5.2 Measuring the Complexity of Embedded Clauses

Although many different variables can contribute to complexity, Jakubowicz's DCM tried to formalize a way to measure the complexity of a derivation. On the subject of the acquisition of subordinate clauses by TD L1 children, Soares (2006), adopting Jakubowicz's DCM (repeated here in 53), argued that the late emergence of complement clauses in TD children was due to the fact that subordination adds to the complexity of a derivation. Soares formulated the "Dependent C" (see 54) and proposed to include it in Jakubowicz's metric for measuring complexity. As stated in (54), the tense dependency between the matrix verb and the subordinate verb and the notion of embedding ("in the domain of a superordinate category") contribute to the complexity of the derivation. One could argue, based on the DCM and the Dependent C that utterances that contain an embedded clause are more complex than utterances that do not.

(53) Derivational Complexity Metric (DCM) (Jakubowicz 2004, 2005, 2010)

a. Merging α_i n times gives rise to a less complex derivation than merging α_i (n + 1) times.

b. Merge of α gives rise to a less complex derivation than Merge of $\alpha + \beta$.

(54) Dependent C (Soares 2006, p. 104):

A category C that is specified for tense [Tense] is dependent if and only if C is in the domain of a superordinate category that bears a tense feature [Tense].

In this study, sentences with an embedded clause are assumed to be more complex than sentences without an embedded clause. Within the different types of subordinate clauses, adverbial clauses and finite and non-finite complement clauses are often argued to vary in degrees of complexity. Assuming that the notion of depth of embedding is key to complexity, adverbial clauses are less complex because they are adjoined to the matrix clause at a higher level compared to complement clauses. Moreover, non-finite complement clauses are argued to be less complex than finite complement clauses because finite complement clauses include tense and mood dependencies between the embedded and matrix clause as well as an additional subject-verb agreement operation in the finite embedded clause (e.g., Tuller et al. 2012). Finally, as stated in Sections 5.3.3 and 5.5.1.4, relative clauses are assumed to be the most complex because of wh-movement and depth of embedding.

Moreover, previous research from various theoretical backgrounds (Owen & Leonard 2006; Marinellie 2004; Gutierrez-Clellen & Hofstetter 1994; Loban 1976) has also claimed that adjunct, complement and relative clauses belong to what is often called complex syntax. Furthermore, recall from Section 5.3.3 that processing studies have shown that structures with center embedding can create processing difficulties in TD adults. Although the exact way that complexity should be measured is a matter of debate, utterances containing a subordinate clause will henceforth be considered complex utterances, whereas monoclausal or conjoined clauses will be considered simple utterances.

5.5.3 Morphosyntactic Properties

As stated in chapter one, the analysis of spontaneous language pursued here is focused on clausal embedding, overall morphosyntactic accuracy as well as the accuracy of specific morphosyntactic properties: verb morphology, object clitics, and gender agreement. The existing literature on TD L2 children and children with SLI (studied separately and compared directly) has focused a considerable amount of attention on the development of these properties (see chapters 2-4). Verb morphology and object clitics have been shown to pose a certain obstacle to all types of learners. Gender agreement has received particular attention for the difficulty that it poses to L2 learners. However, previous direct SLI-L2 comparisons have primarily tested children younger than 9 and with less than 2 years of exposure. Looking at children with larger age and LoE ranges compared to the bulk of previous studies provides an opportunity to gain added insight into the effect of CA and LoE on properties that have previously been shown to cause difficult in L2 learners. This section presents the descriptions of verb morphology, object clitics, and gender agreement in French compared to English.

5.5.3.1 Verb morphology

This section discusses the verb paradigm as well as the characteristics of IP in French. Finiteness marking in various languages has received considerable attention in SLI, L2, and SLI-L2 studies. Indeed, this property is considered a clinical marker of SLI in many Germanic languages (see Chapter 3). Previous studies on French in these developmental contexts have been somewhat inconclusive with respect to the durability and robustness of the root infinitive stage in these learners. Unlike finiteness, tense choice has received very little attention in the French-speaking child L2 literature. The focus on verb morphology in general will allow for an examination of both finiteness and tense choice.

Compared to other Romance languages, spoken French has a relatively weak verbal paradigm with respect to the number of audibly distinct bound inflectional morphemes. As shown in Table 5-1, for verbs in the first conjugation group, there is no audible distinction in the present tense among 1st and 2nd person singular and 3rd person singular and plural verb forms, despite differences in orthography. For paradigms 2 and 3, the same holds for all singular forms, but there is a distinction in the 3rd person plural. Irregular verbs typically pattern with the 2nd and 3rd groups with respect to the number of audible distinctions in their conjugation. Agreement with the subject, however, is generally present in the form of the nominative clitic (see also Section 5.5.3.2) (e.g., *je/tu/il/elle/on/ils/elles chan[t]* ‘il/you/he/she/one/they sing(s)’).[62] The 3rd person singular *on* ‘one’ is overwhelmingly preferred over the first person plural in spoken French, thereby rendering the use of the suffix *–ons* quite rare. There are,

[62] Third person singular and plural clitics are often homophonous. *Il* and *ils* are both pronounced [il] and *elle* and *elles* are both pronounced [ɛl], except when the following word has an initial vowel sound. In that case, the final *–s* [z] is pronounced.

therefore, few phonetically distinct subject-verb agreement suffixes in the present tense paradigm of spoken French.

Table 5-1. French verb paradigm (lexical verbs) (table adapted from Prévost 2009).

	1st group *chanter* 'sing'	**2nd group** *finir* 'finish'	**3rd group** *vendre* 'sell'
Infinitive	chant-er [e]	fin-ir	vend-re
Past participle	chant-é [e]	fin-i [i]	vend-u
Present 1/2/3S	chant-e/-es/-e [t]	fin-is/-is/-it [i]	vend-s/-s/-ø [ã]
1P	chant-ons [ɔ̃]	fin-iss-ons [isɔ̃]	vend-ons [ɔ̃]
2P	chant-ez [e]	fin-iss-ez [ise]	vend-ez [e]
3P	chant-ent [t]	fin-iss-ent [is]	vend-ent [d]
Imperfect 1/2/3S	chant-ais/-ais/-ait [ɛ]	finiss-ais/-ais/-ait [ɛ]	vend-ais/-ais/-ait [ɛ]
1P	chant-i-ons [jɔ̃]	fin-iss-i-ons [jɔ̃]	vend-i-ons [jɔ̃]
2P	chant-i-ez [je]	fin-iss-i-ez [je]	vend-i-ez [je]
3P	chant-aient [ɛ]	fin-iss-aient [ɛ]	vend-aient [ɛ]
Future 1S	chant-er-ai [rɛ]	fin-ir-ai [rɛ]	vend-r-ai [rɛ]
2/3S	chant-er-as/-a [ra]	fin-ir-as/-a [ra]	vend-r-as/-a [ra]
1P	chant-er-ons [rɔ̃]	fin-ir-ons [rɔ̃]	vend-r-ons [rɔ̃]
2P	chant-er-ez [re]	fin-ir-ez [re]	vend-r-ez [re]
3P	chant-er-ont [rɔ̃]	fin-ir-ont [rɔ̃]	vend-r-ont [rɔ̃]
Conditional			
1S/2S/3S	chant-er-ais/-ais/-ait [rɛ]	fin-ir-ais/-ais/-ait [irɛ]	vend-r-ais/-ais/-ait [rɛ]
1P	chant-er-i-ons [rjɔ̃]	fin-ir-i-ons [rjɔ̃]	vend-r-ons [rɔ̃]
2P	chant-er-i-ez [rje]	fin-ir-i-ez [rje]	vend-r-ez [re]
3P	chant-er-aient [rɛ]	fin-ir-aient [rɛ]	vend-r-ont [rɔ̃]
Subjunctive			
1S/2S/3S	chant-e/-es/-e [t]	finiss –e/-es/-e [is]	vend-e/-es/-e [d]
1P	chant-i-ons [jɔ̃]	fin-iss-i-ons [isjɔ̃]	vend-i-ons [jɔ̃]
2P	chant-i-ez [je]	fin-iss-i-ez [isje]	vend-i-ez [je]
3P	chant-ent [t]	fin-iss-ent [is]	vend-ent [d]

Three different past tense types will be discussed here. The first is the perfective compound past tense (*passé composé*) whose formation includes the auxiliary *être* or *avoir* (see Table 5-2) plus the past participle (Table 5.1). The imperfect past (*imparfait*) forms behave like the present tense in terms of the small number of audibly distinct agreement suffixes (compare the number of forms which end in [t] and [ɛ] in 1, 2 and 3S in Table 5.1. The pluperfect past (*plus-que-parfait*) is another compound past tense formed with the imperfect form of the auxiliary *être* or *avoir* and the past participle. French also has a compound and analytic future tense. The compound future (*futur proche*) is formed with the auxiliary *aller* ‘go’ followed by the infinitive.

Table 5-2. French verb paradigm (auxiliaries) (table adapted from Prévost 2009).

		être	*avoir*	*aller*
Infinitive		être	avoir	aller [e]
Past Participle		été	eu	allé [e]
Present	1S	suis [sɥi]	ai [e]	vais [vɛ]
	2/3S	es/est [ɛ]	as/a [a]	vas/va [va]
	1P	sommes	av-ons	all-ons
	2P	êtes	av-ez	all-ez
	3P	sont	ont	vont
Imperfect	1/2/3 S	ét-ais/-ais/-ait [ɛ]	av-ais/-ais/-ait [ɛ]	all-ais/-ais/-ait [ɛ]
	1P	ét-i-ons [jɔ̃]	av-i-ons [jɔ̃]	all-i-ons [jɔ̃]
	2P	ét-i-ez [je]	av-i-ez [je]	all-i-ez [je]
	3P	ét-aient [ɛ]	av-aient [ɛ]	all-aient [ɛ]
Future	1S	ser-ai [rɛ]	aur-ai [rɛ]	ir-ai [rɛ]
	2/3S	ser-as/-a [ra]	aur-as/-a [ra]	ir-as-a [ra]
	1P	ser-ons [rɔ̃]	aur-ons [rɔ̃]	ir-ons [rɔ̃]
	2P	ser-ez [re]	aur-ez [re]	ir-ez [re]
	3P	ser-ont [rɔ̃]	aur-ont [rɔ̃]	ir-ont [rɔ̃]
Conditional	1S	ser-ais [rɛ]	aur-ais [rɛ]	ir-ai [rɛ]
	2S	ser-ais[re]	aur-ais [re]	ir-ais [re]
	3S	ser-ait [re]	aur-ait [re]	ir-ait [re]
	1P	ser-i-ons [rjɔ̃]	aur-i-ons [rjɔ̃]	ir-i-ons [rjɔ̃]
	2P	ser-i-ez [rje]	aur-i-ez [rje]	ir-i-ez [rje]
	3P	ser-aient [rɛ]	aur-aient [rɛ]	ir-aient [rɛ]
Subjunctive	1S	sois [swa]	aie [ɛ]	aille [aj]
	2S	sois [swa]	aies [ɛ]	ailles [aj]
	3S	soit [swa]	ait [ɛ]	aille [aj]
	1P	soyons [swajɔ̃]	ayons [ejɔ̃]	allions [ajɔ̃]
	2P	soyez [swaje]	ayez [eje]	alliez [aje]
	3P	soient [swa]	aient [ɛ]	aillent [aj]

In addition to the ambiguities in the singular person paradigms mentioned above, the existence of several other homophonous endings make the distinction between forms challenging. As can be seen in Table 5-1, the infinitive *–er*, past participle *–é*, as well as the second person plural *–ez* in group 1 are all pronounced [e]. In group 2, the past participle *–i* and the 1st *-is*, 2nd *-is* and 3rd *-it* person singular endings in the present tense are all pronounced [i] despite differences in spelling (which can be phonetic in liaison contexts. The subjunctive is employed only in the present and the compound past. In group one, there is no phonetic distinction between the subjunctive and indicative in the singular and 3rd person plural forms. However, in the 2nd and 3rd groups, 3rd person plural is not homophonous with singular forms.

Despite the small number of audible agreement markers in the French verbal paradigm, French is often considered morphologically rich when compared to English (Pollock 1989). Indeed, spoken French has a greater number of distinctive person agreement forms than English. The French 3rd person singular present form has been described by many researchers as an elsewhere form (as in Halle & Marantz 1993), because the lack of specific person agreement markers allows this verb form to appear in several different contexts (1st, 2nd, 3rd singular and plural) (Prévost 2009, Ferdinand 1996, Paradis & Crago 2001).

In French all finite verbs undergo V to I movement. This means that adverbs, floating quantifiers, and the negative *pas* appear to the right of finite verbs as in (55a, 56a and 57a, from Pollock (1989). In contrast, English does not have V to I movement, as can be seen in 55b, 56b, 57b, which are glosses of the French order. Pollock (1989) and Edmonds (1978) attributed these word order differences between French and English to different settings of the Verb Raising Parameter. As can be seen in 55c, 56c, and 57c, English adverbs appear to the left of finite verbs and do-support is required for negation.

(55) a. Jean (n') aime pas Marie.
b. *John likes not Mary
c. John does not like Mary.

(56) a. Jean embrasse souvent Marie.
b. *John kisses often Mary
c. John often kisses Mary.

(57) a. Mes amies aiment tous Marie.
b. *my friends love all Marie
c. My friends all love Marie.

5.5.3.2 Clitics

The relative delay in the emergence and target use of object clitics compared to subject clitics has generated massive interest in the literature on the acquisition of Romance languages.

Studies on French-speaking children with SLI have revealed that object clitics present considerable difficulty to these learners and that this difficulty is not necessarily resolved with age (Tuller et al. 2011; Audollent & Tuller 2003). The omission of object clitics is considered to be a clinical marker of SLI in the French context. However, L2 children also have difficulties with object clitics. Studies directly comparing children with SLI and L2 children have only looked at young L2 children with less than 3 years exposure. Therefore, part of the interest in object clitics in this thesis is to understand how a group of L2 children with a greater range of chronological age, age of onset and length of exposure compare to age-matched children with SLI. Furthermore, it will be interesting to see if more object clitic errors occur in complex sentences, when cognitive resources are assumed to be stretched.

5.5.3.2.1 Clitic paradigms

French has a rich paradigm of clitic pronouns and strong pronouns, as can be seen in Table 5-3. As is in the case for other languages with clitic paradigms, third person accusative clitics are homophonous with definite determiners and behave similarly when the following word has an initial vowel sound (liaison contexts) (see 58a-c).

Table 5-3. Clitics and Strong Pronouns in French (table adapted from Prévost 2009).

		Clitics				**Strong pronouns**
		Nominative	Accusative	Dative	Reflexive	
Singular	1P	je	me	me	me	moi
	2P	tu	te	te	te	toi
	3P	il (masc)	le (masc)	lui	se	lui (masc)
		elle (fem)	la (fem)	lui	se	elle (fem)
		on (neuter)		lui	se	
Plural	1P	nous	nous	nous	nous	nous
	2P	vous	vous	vous	vous	vous
	3P	ils (masc)	les	leur	se	eux (masc)
		elles (fem)				elles (fem)

(58) a. Le vélo? Je le gare dans le parking.
the.MASC bike+MASC I it.ACC.MASC park in the parking lot
‘The bike? I park it in the parking lot’

b. La moto? Je la gare dans le parking.

the.FEM motorcycle+FEM I it.ACC.FEM in the parking lot

c. L'épouvantail? Je l'ai mis dans le champ.
the scarecrow+MASC I it have put in the field.
'the scarecrow? I put it in the field'

d. Les jouets? Je les range dans le placard.
the+PL toys+MASC+PL I them put in the closet

5.5.3.2.2 Distributional and discursive properties of clitics in French

Clitic pronouns are characterized by a set of distributional constraints which set them apart from strong pronouns and full DPs. As originally outlined by Kayne (1975), distributional characteristics include the preverbal position of object clitics in contrast to the canonical postverbal position of object DPs, as in can be seen in the examples in (59-65). Clitics cannot be separated from the verb by anything except another clitic (compare 59a-c in which the comma represents a pause). They cannot receive contrastive stress (see 60a-c in which the capital letters represent stress) and cannot be used in isolation (e.g., as in a one-word response to a question in (61)). Clitics cannot be conjoined, as shown by the ungrammaticality of (62 a-b). Only strong pronouns and NPs can be the object of a preposition (63). An additional property which distinguishes strong and clitic pronouns is that the latter can have both animate and inanimate referents, while the former are typically restricted to animate referents (64-65).[63]

(59) a. *Il, bientôt, rencontrera Marie.
he.NOM.MASC, soon, will meet Marie

b. *Il la, bientôt, rencontrera.
he.NOM.MASC her.ACC.FEM, soon, will meet

c. Jean / Lui, bientôt, rencontrera Marie.[64]
Jean/him.STRG.PRO soon, will meet Marie

(60) a. *IL rencontrera Marie.
he.NOM.MASC will meet Marie

[63] Examples in 59-65 are from Prévost (2009).
[64] Strong pronouns can behave like subject clitics in the sense that they can be the subject of a tensed verb in certain contexts.

b. *Mon père LA rencontrera.

my father her.ACC.FEM will meet

c. MON PÈRE / LUI rencontrera Marie.

my father/ STRG.PRO.MASC will meet Marie

(61) Qui a rencontré Marie? *Il/Lui/Mon père.
who has met Marie he.NOM.MASC/ STRG.PRO.MASC /my father

(62) a. *Mon père et il rencontreront Marie.
my father and he.NOM.MASC will meet Marie

b. *Mon père la et le rencontrera.

my father him.ACC.MASC and her.ACC.FEM will meet

'my father will meet him and her'

c. Mon père et mon frère / eux rencontreront Marie.

my father and my brother / STRG.PRO.PL will meet Marie

(63) a. *Marie a parlé avec le.
Marie has spoken with ACC.MASC.SG

'Marie spoke with him'

b. *Marie a parlé avec il.

Marie has spoken with NOM.MASC.SG

c. Marie a parlé avec mon père / lui.

Marie has spoken with my father /STR.PRO.MASC.SG

(64) a. Cet homme$_i$, il$_i$ apprend le japonais.
this man$_i$, he$_i$ learns the Japanese

b. Ce voyagei$_i$ il$_i$ me fait rêver.

this trip$_i$, it$_i$ me makes to-dream.INF

(65) a. Cet homme$_i$, je le$_i$ connais depuis des années.
this man$_i$ I him.ACC.MASC.SG$_i$ know since some years
'this man, I have known him for years'

b. Cet homme$_i$, j'entends parler de lui$_i$ depuis des années.
this man$_i$ I hear speak.INF of STRPRO.MASC.SG$_i$ since some years
'this man I've heard people talk about him for years'

c. *Ce voyage$_i$, j'entends parler de lui$_i$ depuis des années.
this trip$_i$ I hear speak.INF of STRPRO.MASC.SG$_i$ since some years
'this trip I've heard people talk about him for years'

An additional property that is specific to third person accusative clitics is that they can be legitimately omitted when the object refers to sufficiently salient discourse topic (Lemoine 1997). Lexical restrictions exist, but direct objects with a definite, specific interpretation are found to be dropped with relative frequency in colloquial French (Fónagy 1985; Tuller 2000).[65]

(66) a. Voulez-vous que je vous donne mon numéro de téléphone? —Non, je connais __.
want-you that I you give my number of telephone no, I know
'Do you want me to give you my phone number? No, I know __'

b. Les Hauts-de-Seine, vous connaissez __?
the Hauts-de-Seine, you know
'The Hauts-de-Seine, you know __' (Fónagy 1985)

In addition to nominative, accusative, and dative clitics, French has a partitive clitic *en* and a locative clitic *y*, as shown in (67) and (68) (from Jones 1996). These clitics do not display morphological agreement in person, number or gender, but they obey the distributional constraints described above. Another difference is that these clitics can replace an entire prepositional phrase instead of just the NP like accusative clitics (Jones 1996).

(67) a. Le train y est arrivé <à la gare>
the train CL.LOC has arrived <at the train station>
'the train has arrived there'

[65] The examples in (21) are from Tuller et al. (2011a).

b. Pierre y a posé son manteau <sur la chaise>

Peter CL.LOC has put his jacket <on the chair>

'Peter put his jacket there'

(68) a. Pierre s'en souvient <de son enfance>

Peter CL.ACC.REFL CL.PART remembers <of his childhood>

'the train has arrived there'

b. J'en ai lu la préface <de ce livre>

I CL.PART have read the preface <of this book>

'I have read the preface of it'

c. Henri en a lu beaucoup <de livres>

Henri CL.PART has read a lot <of books>

'Henri has read a lot of them'

5.5.3.2.3 Status of clitics

The status of clitics in Romance languages has been the subject of much debate. This debate will be discussed here briefly, but no specific position will be adopted. Part of the difficulty with coming to a consensus on this matter seems to be that clitics behave in some ways like independent syntactic entities and in some ways like inflectional morphemes. On one side of the debate are those who consider that clitics are base-generated in object position and undergo movement to their surface positions. This is in contrast to approaches assume that clitics are inflectional affixes. Independent of the base-generation or affixal approach is the question of whether clitics represent arguments of the verb or not (see Auger 1994 for a review). Kayne (1975) proposed a movement analysis in which the object clitic was base generated in canonical object position and moved to preverbal position (69). He argued that the ungrammaticality of examples such as (70) is caused by the doubling of an object clitic and a DP object, which shows that both entities occupy the same position. As for subject clitics, Kayne proposes to consider them as weak pronouns that occupy the canonical subject position and then cliticize phonologically to the verb, in contrast to object clitics, which are syntactic clitics. One distributional property that distinguishes between the two is that subject clitics do not necessarily need to be repeated in conjoined clauses, but object clitics do (as in 71-72, from Prévost (2009)).

(69) Pierre la_i rencontre t_i
Pierre her.ACC.FEM meets
'Pierre meets her'

(70) *Jean le_i lit le $livre_i$
Jean it.ACC.MASC reads the book

(71) *Il ira à Paris et Ø visitera la Tour Eiffel.
He will go to Paris and visit the Eiffel Tower

(72) Pierre le prend et *(le) jette à la poubelle.
Pierre it.ACC.MASC takes and (it.ACC.MASC) throws in the garbage

However, other researchers such as Auger (1994), Zribi-Hertz (1994) and Roberge (1990) have argued for an inflectional affix analysis in which the clitic is base generated in preverbal position (as in 73 and 74). As support for this position, they report that subject doubling with a DP subject and subject clitic (as in 75) is very frequent in many varieties of French. Moreover, it is pointed out that there is no obligatory pause between the DP and the clitic, which suggests that the DP in subject-doubled structures is not dislocated (see 75), but there is not wide agreement on this point (De Cat 2002). Because the DP and the clitic cannot both occupy the subject position, the clitic is argued to be an agreement marker on the verb (as in 75b-c). Because sentences without a DP subject are grammatical, the inflectional affix analysis assumes that French is a pro-drop language. In this case, when the null subject *pro* can be identified in the discourse, *pro* is assumed to occupy the subject position.

(73) $[_{IP}$ Le prof $[_{I}$ il+donne] beaucoup de travail]]
The prof he.NOM.MASC gives a lot of work

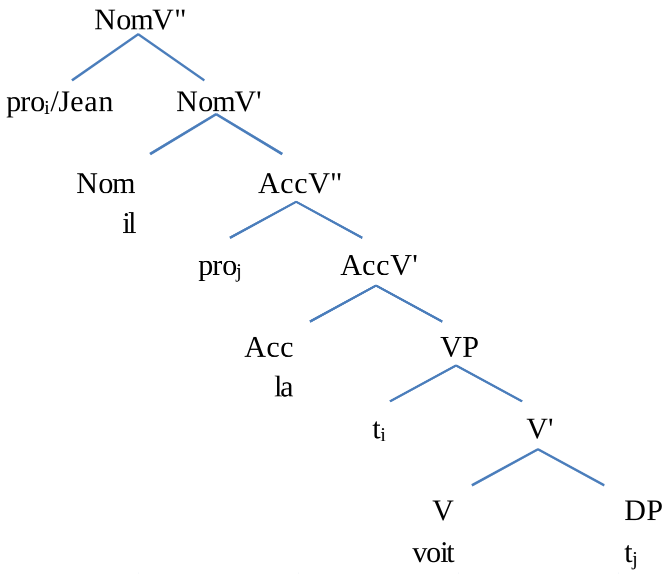
(74) [Peter $[_{I}$ la_i+$rencontre_j$] $[_{AgrOP}[_{AgrO}$ t_j]$[_{VP}$ t_j pro_i]]]
Peter her.ACC.FEM meets

(75) a. Le prof il donne beaucoup de travail.
The prof he.NOM.MASC gives a lot of work
b. $[_{IP}$ pro_i $[_{I}$ il_i+donne] beaucoup de travail]]
c. *$[_{IP}$ *pro* $[_{I}$ donne] beaucoup de travail]]

Sportiche (1992) argued that certain components of both types of analyses were on the right track. He therefore combined these elements to elaborate a sort of hybrid analysis. He incorporated both a movement and a base generation analysis to which he added that clitics project their own categories called Clitic Voices. His proposed representation is in (76b), which shows that the clitic is in a specifier-head relationship with pro, which was moved from its base-generated position inside the VP.

(76) a. Jean il la voit.
Jean he.NOM.MASC her.ACC.FEM sees

b.



Overall, the differences between English and French for object pronouns are stark. English pronouns are strong pronouns and do not distribute like clitics in French. English pronouns appear in postverbal position, like other DP objects.

5.5.3.3 Grammatical gender

Grammatical gender is notoriously difficult for L2 learners to acquire. Grammatical gender has been studied relatively less frequently compared to object clitics and verb morphology; however, existing studies reveal that this population does not perform like TD children the same age. Only one study has directly compared children with SLI and L2 children on gender assignment in French. The investigation of gender in the present study seeks to add to the knowledge of how gender marking is used and whether it becomes target-like with time.

French has a binary grammatical gender system in which nouns are associated with masculine or feminine. Gender is marked on determiners, adjectives, the quantifier *tout* ‘all,’ and on some nouns (including those referring to professions, family members, and animals). Gender assignment is arbitrary, outside of a small number of nouns with natural gender (*une femme* ‘a.FEM.SG woman,’ *un homme* ‘a.MASC.SG man,’). However, the use of semantic clues to determine gender assignment is not of great assistance to the learner. Séguin (1969, cited by Ayoun 2007) reported that semantic gender accounted for only 10.5% of all French nouns. Furthermore, the link between natural and grammatical gender is not consistent. For example, gender agreement with certain animal nouns does not depend on natural gender (e.g., *une giraffe* ‘a+FEM.SG giraffe’ refers to both male and female giraffes (Prévost 2009)) and nouns such as *victime* ‘victim’ are always feminine, regardless of the gender of the referent.

The form of the determiner, whose presence is almost always obligatory, typically provides a signal in the input as to the gender of the noun it modifies. However, not every form of the determiner is overtly marked for gender. As can be seen in Table 5-4, the plural forms *les, des,* and *ces* are used with masculine and feminine plural nouns. When a determiner is followed by a word with an initial vowel sound, the elided form of the definite determiner (*l’*), which is gender neutral, is required, as in *l’arbre* ‘the tree+MASC’ and *l’histoire* ‘the story+FEM.’ Possessive determiners are marked for both person and gender in singular forms, but only for person in plural forms. Singular possessive feminine determiners become indistinguishable from the masculine form in liaison contexts (compare (70a-d)).

Table 5-4. Gender and Number Agreement on French Determiners (table adapted from Prévost 2009)

Determiners	Masculine	Feminine	Plural
Definite	le	la	les
Indefinite	un	une	des
Demonstrative	ce	cette	ces
Partitive	du	de la	
Possessive			
1/2/3 SG	mon/ton/son	ma/ta/sa	mes/tes/ses
1/2/3 PL	notre/votre/leur	notre/votre/leur	nos/vos/leurs

(77) a. mon ami
my friend+MASC

b. mon amie
my friend+FEM

c. mon meilleur ami
my.masc best friend+MASC

d. ma meilleure[66] amie
my.fem best friend+FEM

The prepositions *de* 'of' and *à 'to'*, when followed by the masculine singular definite determiner *le* become the amalgamated forms *du* and *au*, respectively. The masculine singular partitive determiner *du* is homophonous with the amalgamated preposition and determiner *du* (78a-b).

[66] The feminine is marked with an *e* in written French, but there is no difference in the pronunciation of *meilleur* compared to *meilleure* or *ami* compared to *amie*.

(78) a. du pain
some bread+MASC

b. le chat du voisin
the chat of+the.MASC neighbor+MASC
'the neighbor's cat'

Masculine gender forms have been argued to be the default gender in French (Ayoun 2007). Masculine gender is used in the nominalization of other syntactic categories. For example, the verbs *boire* 'drink' and *manger* 'eat', take the masculine singular form of the determiner when used as nouns (le boire 'drinking', le manger 'eating'). Masculine gender is also used for colors (le bleu 'blue', le blanc 'white', le gris 'grey').

Although many previous studies on the L2 acquisition of French gender have assumed that "unambiguous positive evidence" is available to learners in the input, Ayoun (2007) argued that clues involving French gender are not as straightforward as often assumed. She discusses three types of clues that are typically reported to serve as input to the L2 learner: semantic, morpho-phonological, and gender marking on determiners. As discussed above, semantic clues do not provide much assistance in gender assignment (only 10.5% of nouns have semantic gender).

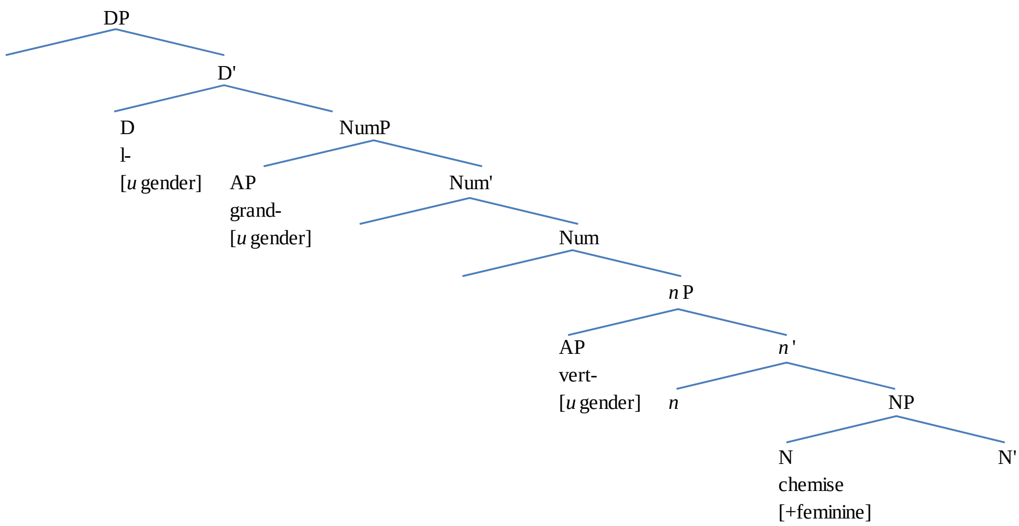
For morpho-phonological cues, strong correlations have been observed between the form of the ending of a noun and its gender. For example, all nouns ending in *–isme* (as in *capitalisme*) are masculine and those ending in *–ation* (as in *nation*) are feminine. Final sounds can also provide clues. For example, Corbett (1991) reports that 99% of words ending in [ã], [ɛ̃], such as *un appartement* 'an apartment', are masculine. Indeed, recall from Chapter 3 that Karmiloff-Smith (1979) exploited stereotypical masculine and feminine endings to elicit gender agreement on made-up nouns from TD L1 children. However, it appears that only a handful of morpho-phonological forms consistently signal either masculine or feminine gender, whereas other generalities tend to be somewhat unreliable (see Ayoun 2007 and sources cited therein). In her article about adult L2 learners of French, Ayoun (2007) points out that the utility of morpho-phonological cues also supposes that adult L2 learners have target phonetic representations of the nouns in their input and that this might not be the case for adult learners with low L2 proficiency. I suppose the same question could be applied to L2 children in early stages of acquisition.

As discussed previously, although singular determiners send a clear signal as to the gender of the noun they modify, plural determiners do not (see Table 5-4). Therefore, Ayoun argues that L2 learners face “complex and ambiguous input” (p. 147) with respect to grammatical gender and assignment.

In languages with nominal classification systems like French, it is commonly assumed that nouns are specified for gender [+/- fem] in the lexicon. In languages like English, with no grammatical gender distinction, there is no such gender feature. Following Carstens (2000), it will be assumed that French nouns carry an uninterpretable [*u*gender] feature that is checked during overt or covert noun movement (as in the representation in 75b, from Prévost 2009). Determiners and adjectives, which have no initial gender specification, enter into a head/head or specifier/head agreement relation with the noun. Once the [*u*gender] features are checked, the adjective and determiner will be specified for gender.

Following Prévost (2009), I will assume a Distributed Morphology (Halle & Marantz 1993) analysis in which gender agreement is considered a property of the lexicon. Lexical items are inserted after the syntactic derivation via feature matching. In (79a-b), the [+feminine] forms which are inserted are *la*, *grande*, et *verte*.

(79) a. la grande chemise verte
the.FEM large.FEM shirt+FEM green.MASC
‘the large green shirt’

b.


5.6 Conclusion

The first part of this chapter discussed the general objectives, hypotheses and predictions of this thesis. The second half of this chapter presented the paradigms and analyses of underlying structure for the types of embedded clauses and morphosyntactic properties that are under investigation in the current study. The relative complexity of different subordinate clauses in French was discussed. The investigation of clausal embedding fills a hole in the literature on child L2 acquisition and allows for the examination of the impact of complexity on development in this particular context. Studying the accuracy of morphosyntactic properties such as verb morphology, object clitics, and grammatical gender allows for a comparison with results from previous studies. Furthermore, the wider range of chronological age, AoO, and LoE in the population of this study allows for a better understanding of development in somewhat older children with SLI as well as in L2 children who vary more in all three factors compared to previous work (see Chapter 4).

The use of spontaneous language as a data collection method allows for the study of the frequency of embedded clauses and the morphosyntactic accuracy of several different properties. Moreover, spontaneous language is collected under somewhat natural contexts of language use and therefore will not be affected by issues of felicity. As will be explained in the following chapter, these data were collected longitudinally, at intervals of 12 months in order to measure how each group develops over time.

6 Methodology

6.1 Introduction

This chapter presents the details of the experimental and control populations and language data collection methods used in the current study. This chapter is organized as follows: Section 6.2 discusses the characteristics of the children who participated in this study as well as details pertaining to their recruitment. This section also includes a description of the age groups which will used to more closely examine the comparability of older children with SLI with older L2 children. In Section 6.3.1, the standardized tests used to assess language and memory will be presented. In Section (6.3.3), the coding system and language measures adopted for the analysis of spontaneous language are explained. The final section (6.3.4), describes the decisions made concerning statistical tools and analyses.

6.2 Participants

6.2.1 L2 children

The child L2 population consists of 22 children (16 girls, 6 boys) of British origin whose parents are both native English speakers and whose families immigrated to France. These children had no prior knowledge of French before moving from the UK. At the time of testing, these children were all attending ordinary primary or middle schools in the France. The L2 children were recruited for this study via contacts with private and public elementary schools that the children were attending, contacts with English-speaking associations, ads taken out in English-speaking publications in France, and word of mouth. The first step in the recruitment process consisted of collecting responses to an initial language profile questionnaire (see Appendix A). This information allowed us to verify that the child had the following characteristics: 1) monolingual English-speaking parents from birth; 2) minimum age of onset of four years old, as determined by when their families moved to France; and 3) chronological age between 5;11 and 12;11. The age of arrival in France was used as the age of onset because these children started attending French school immediately following their arrival. The monolingual status of the parents indicated that these children were exposed to only one language until moving to France. The minimum age of onset was chosen in order to correspond to a widely adopted definition of an L2 child (as in Schwartz 2004, see Chapter 2). However, unlike Schwartz's L2 child definition, the decision was made to include children as old as 12. This decision was made in order to more closely correspond to the ages of the children with SLI and to have a wider range of age of onset (younger and older than age 7-8) and a wider range of LoE. More fundamentally, older L2 children were recruited in order to examine more comprehensively the phenomenon of L2 acquisition throughout childhood.

If the child fit the criteria and parental authorization was received, testing sessions were then organized either at school or at home. The same families or schools were contacted a year later for the second round of testing sessions at T2. Table 6.1 shows the general characteristics of this population at T1 and T2, including chronological age (CA), age of onset (AoO), length of exposure (LoE), non-verbal intelligence scores (Raven's Matrices) and a receptive vocabulary score in French.

Table 6-1. Characteristics of the L2 Group at T1 and T2.

Child	**CA**		**AoO**	**LoE**		**Sex**	**Raven's Matrices**[a]	**French Receptive Vocab**		**Grade in School**	
	T1	T2		T1	T2			T1	T2	T1	T2
RHR	6;9	7;9	4;9	1;11	2;11	F	3	-2.05	-0.24	1	2
PUS	7;1	8;1	4;6	2;7	3;8	F	3	-0.67	-3.00	1	2
ALC	7;4	8;4	5;9	1;7	2;7	M	3	-0.46	1.44	1	2
LOS	7;4	8;4	6;6	0;11	1;10	F	4	-1.33	-1.15	1	2
ALJ	7;8	8;10	5;6	2;3	3;4	F	2	-0.46	1.07	2	3
BEA	8;9	9;8	5;4	3;5	4;5	M	4	-0.04	0.00	3	4
IOC	8;9	9;9	5;1	3;8	4;8	F	1	-2.26	-1.15	3	4
WRS	8;9	9;10	6;2	2;7	3;8	M	4	0.33	0.77	3	4
LEP	9;0	10;2	6;0	3;1	4;2	F	4	-1.92	-0.77	3	4
HAS	9;1	10;0	8;2	0;11	1;10	M	3	-3.08	-1.68	3	4
EMH	9;4	10;3	8;4	0;11	1;11	F	3	-1.15	-0.77	3	4
LAD	9;7	10;6	5;10	3;8	4;8	F	3	-1.15	-1.68	3	4
MER	9;10	10;10	7;11	1;11	2;11	F	4	-2.14	-1.23	4	5
HEA	10;1	11;1	6;8	3;5	4;5	M	2	-1.23	-0.24	4	5
HOS	10;8	11;8	8;1	2;7	3;8	F	5	-0.32	0.67	5	6
SAJ	11;1	12;3	8;4	2;9	3;11	F	1	-2.06	-1.76	3	4
DAD	11;3	12;3	7;7	3;9	4;8	F	4	0.06	-0.24	6	7
MAS	11;4	12;4	10;5	0;11	1;10	F	5	-2.36	-0.24	5	6
LIB	11;8	12;8	7;8	4;0	4;11	F	3	-0.85	0.67	6	7
RAG	12;0	13;1	8;2	3;11	4;11	F	4	1.27	1.58	6	7
LOC	12;3	13;3	10;9	1;5	2;6	F	5	-1.15	0.06	5	6
ALP	12;7	13;8	9;7	3;1	4;2	M	3	-0.85	0.06	5	6
M	**9;8**	**10;8**	**7;0**	**2;6**	**3;6**	**-**	**3.3**	**-1.08**	**-0.36**	**-**	**-**
SD	*1;9*	*1;10*	*1;0*	*1;1*	*1;1*	-	*-1.13*	*1.03*	*1.15*	-	-

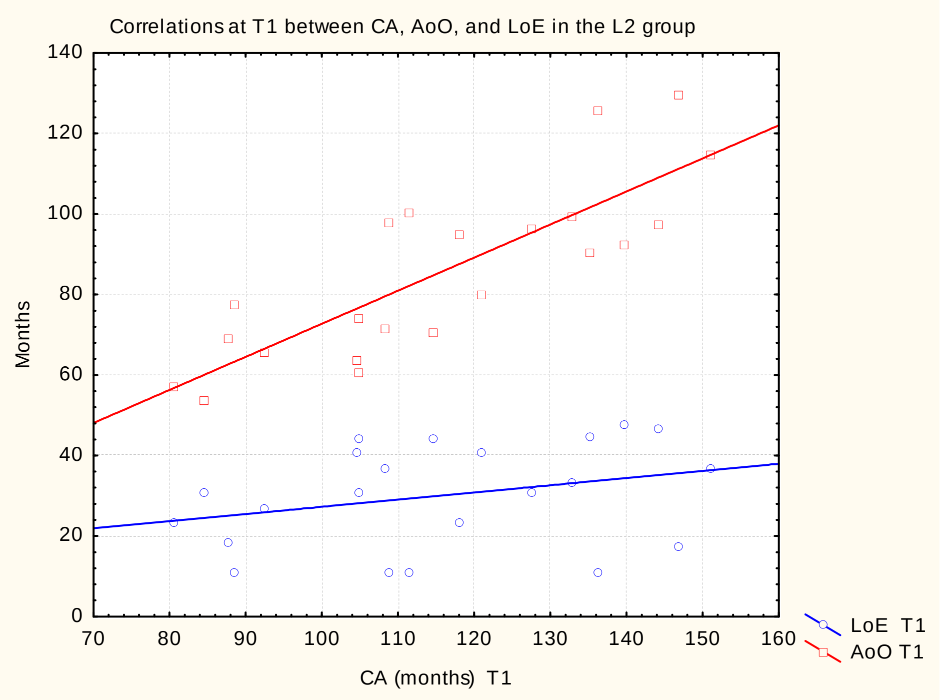
Between T1 and T2 or during the first round of testing sessions, all families filled out a longer family questionnaire asking for more details about the frequency in which the child uses English and French at home, about family history of language impairment, and about socio-economic status (education) (see Appendix B for the full questionnaire and Appendix C for the relevant data). This questionnaire was adapted from several other language profile questionnaires used in France, Canada, and the UK. The information from this questionnaire was collected in order to present a clearer picture of the environment in which these children are developing their L2. Contradictory to what is often assumed about British families living in France, these families did not necessarily benefit from a very high socio-economic status. In addition to achieving a better understanding of the families' sociolinguistic and socioeconomic context, this questionnaire served as a pilot from which later questionnaires were developed (e.g., Abou Melhem 2011). Because of the preliminary nature of the questionnaire and because the major objective for collecting this information was to have a better general sense of the environment in which the L2 children were acquiring French, the questions were not organized in a way that allows for quantitative analyses. Nevertheless, this information was quite useful and will be referred to later when interpreting the profiles of certain individual children.

The recruitment criteria which were adopted for the L2 population of this study led to a situation in which the CA and AoO were highly correlated (r_s = 0.82, p < 0.0001). Because AoO was limited to 4 and because the target age range included children aged anywhere from 6-12, the L2 children with older CA (> 9;4) were the only children who could potentially have a later AoO (e.g., > 7;6). Obviously, none of the younger children (CA < 7;6 at the time of testing) could have an AoO greater than 7;6. Furthermore, all but two of the older L2 children had early AoO. If we had had more luck in the recruitment process, we might have found a greater number of older children with early AoO to lessen the correlation slightly; however, this was not the case. This type of methodological problem is common to second language research involving immigrant populations. For example, Stevens (2006) discussed how the equation in (64) can lead to difficulty in interpreting the effect of any one of these variables. She notes that because these variables are linearly dependent (i.e., values of two variables determine the value of the third p. 672), partial correlations or interaction analyses do not yield reliable results (Stevens 2006). In order to deal with this issue, efforts will be made to carefully analyze correlations between AoO and language measures in terms of the effect of CA.

(80) CA = LoE + AoO

Although the correlation between AoO and CA is very strong, the correlation with LoE is positive, but not significant (r_s = 0.3, p = 0.18) (see Figure 6-1).

Figure 6-1. Correlations between CA, AoO, and LoE in the L2 group at T1.



6.2.2 Children with SLI

A group of 19 monolingual French-speaking children with SLI were compared to the L2. These participants were recruited from language reference centers and special language classes located three different cities in France (Tours, Angers, Poitiers), where they had been diagnosed with SLI following usual inclusionary and exclusionary criteria. To give a better idea of the diagnostic procedures for a majority of this population, 13 of the 19 children with SLI were diagnosed at the same university teaching hospital in Tours following clinical examination and standardized tests targeting all areas of language (articulation and phonology, EEL, Chevrie-Muller & Simon & DeCante 1980; expressive lexicon and expressive morphosyntax, ELO, Khomsi 2001; receptive lexicon, TVAP, Deltour & Humpkens 1980; receptive morphosyntax, NSST, Lee 1971). A cutoff for pathological performance of -1.65 *SD* is used by clinicians at this institution, as is relatively common practice in France. Audiograms are made to ensure normal hearing, IQ is tested (all participants in this study have a performance IQ superior to 85), and a neuropediatric examination is performed to rule out any acquired source for language impairment. Eighteen out of the 19 children had received a diagnosis of phonologic-syntactic SLI and one child (ANE) had lexical semantic SLI. General information on the participants with SLI can be found in Table 6-2.

Table 6-2. General Characteristics of the Children with SLI at T1 and T2.

Child	CA		Age of diagnostic	Sex	Raven's Matrices[a]	Receptive Vocab		Grade in School		PIQ[b]
	T1	T2				T1	T2	T1	T2	
KIB	6;5	7;7	5;8	M	4	-1.14	0.20	1	2	4[c]
ROA	6;8	7;9	5;4	M	3	1.14	-0.02	1	2	3[c]
JOC	7;4	8;4	6;4	M	5	-0.45	1.44	1	2	107
MAB	7;7	8;7	5;6	M	4	-0.23	1.81	2	2	110
JEM	8;4	9;6	6;0	M	5	-0.78	-0.38	3	4	119
SEL	8;6	9;6	6;8	M	4	-0.20	1.15	CLIS[e]	CLIS	121
THB	9;1	10;1	4;11	M	1	-0.24	-1.23	CLIS	CLIS	101
FLC	9;1	10;2	8;7	F	3	0.38	-0.31	3	4	88
ELG	9;4	10;7	6;0	M	2	-1.15	-1.68	3	4	94
LUM	10;4	11;4	8;3	F	2	-1.23	-0.24	CLIS	3	81
ANE	10;5	11;8	10;1	M	4	-3.95	-1.76	4	5	94
COD	10;7	11;6	6;9	M	0	0.14	-0.24	4	5	100
DYR	11;2	12;2	6;10	M	4	-1.45	-0.24	5	6	113
CLH	11;4	12;4	7;8	M	5	0.36	0.60	4	5	104
NIP	11;4	12;5	8;5	M	2	-1.15	-0.84	4	Segpa[d]	93
BRR	11;5	12;6	9;5	M	3	-1.45	-0.84	5	Segpa	92
CLF	11;6	12;5	7;1	F	3	-0.55	-0.24	5	6	3[c]
ERG	12;2	13;4	7;1	M	4	-0.54	-0.85	5	6	4[c]
QUL	12;11	14;2	7;2	M	5	0.36	-0.85	6	7	99
M	**9;9**	**10;10**	**6;11**		**3.3**	**-0.64**	**-0.24**	-	-	-
SD	*1;11*	*1;11*	*1;6*		*-1.4*	*1.08*	*0.97*	-	-	-

[a] The Raven's Matrices scores (0-5) correspond to the following percentiles: 5: ≥ 75, 4: 50 < 75, 3: 25 < 50, 2: 10 < 25, 1: 5 < 10, 0: < 5).
[b] Non-verbal scores obtained prior to our study. PIQ refers to the performance IQ score from the Wechsler Intelligence Scale for Children. Scores obtained from other tests are noted.
[c] Scores from 0-5 correspond to Raven's Matrices non-verbal performance scores which were obtained by clinicians prior to the child's participation in the study (see scale in note A).
[d] *Sections d'Enseignement Général et Professionnel Adapté*. These classes, which are offered beginning in middle school (college), can include children with learning disabilities or various types of behavioral issues.
[e] *CLasse d'Intégration Scolaire*. These classes are adapted for pupils with special language needs (SLI and dyslexia).

The group of children with SLI was matched on mean age with the L2 children. The children with SLI and the L2 children also had very similar performance on non-verbal intelligence (Raven Progressive Matrices) and on a standardized receptive vocabulary assessment (ELOLA,[67] Agostini et al., 1998). The scores for these tasks are presented in Table 6-2. At the time of testing, the children with SLI were attending ordinary French schools, though three of them were in a special language class, and all of them were in speech-language therapy.

[67] *Evaluation du Langage Oral de L'enfant Aphasique:* Evaluation of Oral Language in Aphasic Children.

6.2.3 L2 and SLI Age Groups

The language data collected will often be analyzed in terms of age groups in order to better answer the question of whether older children with SLI and older L2 children are comparable in the same ways as the younger children. To better distribute the children with LoE with less than a year, the cutoff age was slightly different for each group (SLI: 9;4 for the L2: 9;1). The younger groups will be referred to as SLI 6-9 and L2 6-9, respectively and the older groups SLI 9-12 and L2 9-12, respectively. These labels will be used at both T1 and T2 for the sake of consistency, despite the fact that the groups are one year older at T2. The CA, AoO, and LoE of L2 age groups are given in Tables 6-3 and 6-5, respectively and the ages of the SLI age groups are given in Table 6-4 and 6-6, respectively.

Table 6-3. General Characteristics of the L2 6-9 at T1 & T2.

Child	**CA**		**AoO**	**LoE**	
	T1	**T2**		**T1**	**T2**
RHR	6;9	7;9	4;9	1;11	2;11
PUS	7;1	8;1	4;6	2;7	3;8
ALC	7;4	8;4	5;9	1;7	2;7
LOS	7;4	8;4	6;6	0;11	1;10
ALJ	7;8	8;10	5;6	2;3	3;4
BEA	8;9	9;8	5;4	3;5	4;5
IOC	8;9	9;9	5;1	3;8	4;8
WRS	8;9	9;10	6;2	2;7	3;8
LEP	9;0	10;2	6;0	3;1	4;2
HAS	9;1	10;0	8;2	0;11	1;10
M	**8;1**	**9;1**	**5;9**	**2;3**	**3;4**
SD	*0;11*	*0;11*	*1;1*	*1;0*	*1;0*

Table 6-4. CA of the SLI 6-9 Group at T1 and T2.

Child	**CA**	
	T1	**T2**
KIB	6;5	7;7
ROA	6;8	7;9
JOC	7;4	8;4
MAB	7;7	8;7
JEM	8;4	9;6
SEL	8;6	9;6
THB	9;1	10;1
FLC	9;1	10;2
ELG	9;4	10;7
M	**8;2**	**9;1**
SD	*1;1*	*1;1*

Table 6-5 CA, AoO, & LoE of the L2 9-12 at T1 and T2.

Child	**CA**		**AoO**	**LoE**	
	T1	**T2**		**T1**	**T2**
EMH	9;4	10;3	8;4	0;11	1;11
LAD	9;7	10;6	5;10	3;8	4;8
MER	9;10	10;10	7;11	1;11	2;11
HEA	10;1	11;1	6;8	3;5	4;5
HOS	10;8	11;8	8;1	2;7	3;8
SAJ	11;1	12;3	8;4	2;9	3;11
DAD	11;3	12;3	7;7	3;9	4;8
MAS	11;4	12;4	10;5	0;11	1;10
LIB	11;8	12;8	7;8	4;0	4;11
RAG	12;0	13;1	8;2	3;11	4;11
LOC	12;3	13;3	10;9	1;5	2;6
ALP	12;7	13;8	9;7	3;1	4;2
M	**11;0**	**12;0**	**8;4**	**2;8**	**3;8**
SD	*1;1*	*1;1*	*1;5*	*1;1*	*1;2*

Table 6-6. CA of the SLI 9-12 at T1 and T2

Child	**CA**	
	T1	**T2**
LUM	10;4	11;4
ANE	10;5	11;8
COD	10;7	11;6
DYR	11;2	12;2
CLH	11;4	12;4
NIP	11;4	12;5
BRR	11;5	12;6
CLF	11;6	12;5
ERG	12;2	13;4
QUL	12;11	14;2
M	**11;4**	**12;4**
SD	*0;10*	*0;10*

6.2.4 Control Population

Different age groups of monolingual French-speaking children benefiting from language development in typical circumstances will be used to compare to the SLI and the L2 children. A group of 14 4-year-old children (TD4) were used as approximate language matches to the SLI. A group of 24 children (12 8-year-olds and 12 11-year-olds) were used as approximate age matches. These two ages were combined because their spontaneous language measures did not differ significantly and because their mean age when combined was similar to the mean age of the SLI and L2 at T1. However, as can be observed, the age range is not the same. Both the SLI and L2 groups have a couple of children who are younger than 8 and a handful who are older than 11 at T1. Furthermore, the TD data collection was cross-sectional, therefore, the SLI and the L2 are a year older than the TD8+11 at T2. These differences will be taken into account during the results and discussion portion of this thesis. A group of 12 6-year-olds will also be used when necessary. The information concerning these populations can be found in Table 6-7.

Table 6-7. General Characteristics of the TD Control Groups.

TD Group	**N**	**Mean age *(SD)***
TD4	14	4;1 *(0;1)*
TD8+11	24	9;10 *(1;8)*

6.3 Materials

This section presents the details of the language data and measures which were collected from the SLI and L2 populations. Section 6.3.1 describes the standardized tests and Section 6.3.3 deals with the spontaneous language coding and measures.

6.3.1 Standardized Tools

Several standardized tools were used as an independent assessment of the language abilities of the SLI and L2 children. A sentence completion and (real) word repetition task from a battery of standardized tests (BILO3C, Khomsi et al. 2007) were used as an independent measure of the participants' French and to see how they compare to a TD monolingual population. The Core Language Subtests (CLS) from the CELF-4 (Semel et al. 2006), were used to ascertain the L2 children's abilities in their L1. The digit span task from the WISC-IV was used to measure short term and working memory (Wechsler 2003). These tests will be described in more detail below.

In addition to providing a baseline reading on the children's French, the standardized scores will be compared to spontaneous language measures to better understand to what extent the L2 children's language development can be underestimated by standardized assessments that use monolingual TD children as their unique norm-referencing population.

6.3.1.1 Sentence completion

The sentence completion task is a computerized test that the children took with the help of research assistant. During the test, a picture appears on the screen and the child hears the beginning of a sentence. Next, a second picture appears and the child is asked to complete the sentence according to the second picture. The researcher then scores the response given by the child. The children's responses were audio recorded for scoring verification at a later time.

6.3.1.2 Word repetition

The word repetition task was also administered via recordings stored on a computer. The items in this test are real words; however, their familiarity and length increase as the test progresses so that many children most likely do not know most of the words at the end of the test. The researcher then scores the response given by the child. The children's responses were audio recorded for scoring verification at a later time.

6.3.1.3 Digit Span

The forwards and backwards digit span task from the WISC-IV was used to measure short term and working memory, respectively. The total score obtained for both subtests was also analyzed. Digit spans were collected from the L2 children in both French and English. The digit span was administered by a research assistant who read the items aloud according to the directions provided with the test.

6.3.1.4 CELF-4

The Core Language subtests from the CELF-4 battery (Clinical Evaluation of Language Fundamentals, Semel et al. 2006) were used to assess the L2 children's English. The individual scores from these four subtests allow for the calculation of a global score, called the Core Language score (henceforth, CELF-CLS). According to the authors of the CELF, the CELF-CLS "best discriminates language performance of average or above average language users from language performance observed in children and adolescents with language disorders" (Semel et al. 2006, Examiner's Manual, p.107). The cutoff score for the CLS is set at -1 *SD* (85 standard score) or below. If a child obtains a score below the cutoff, the authors of the CELF recommend further testing.

Table 6-8. CELF-4 Subtests per Age Group.

CELF-4 Subtests	Ages 5-8	Ages 9-12
Concepts and following directions	✔	✔
Word structure	✔	
Recalling sentences	✔	✔
Formulated sentences	✔	✔
Word classes		✔

The type of subtest administered depends on the age of the child in question, as shown in Table 6-8. The first subtest in the list, *Concepts and Following Directions*, asks the child to identify pictures in response to oral instructions given by the experimenter. The objective of this test is to evaluate oral comprehension (of increasingly long and complex instructions), recall (of the names and order of objects given by the experimenter), and picture identification. The *Word Structure* test is a sentence repetition task targeting morphosyntax. *Recalling Sentences* is a sentence repetition task, which is scored on a 3-point scale (1 error = 2 points, 2-3 errors in 1 point, 4+ errors = 0 points). In the *Formulated Sentences* task, the child is asked to produce a sentence including a target word in a relation to stimulus picture. The sentence produced by the child is evaluated for morphosyntactic and semantic well-formedness. The *Word Classes* subtest is a vocabulary and oral expression task which evaluates the child's ability to identify the two closest semantically related words from a list of four items. The child is then required to explain the relationship between the two related words.

The UK edition of the CELF-4 is based on a norm-referencing population of 871 children attending traditional (public or private) schools from all geographic regions of the UK. The sample did not include children from special schools, but did not exclude children who were "receiving special support in the school" (p. 203). The children in the population were representative of the racial and ethnic diversity in the UK; however, specific information concerning the language background of these children is not provided. Concerning the English language requirement for inclusion in the sample, the authors report that "children were tested only if they could speak and understand English" (p. 203).

6.3.2 Procedure for Standardized Tests

As mentioned above (Section 6.3.1) the testing sessions took place at the child's home or at school. The testing sessions included additional experimental tasks and therefore a long break was taken halfway through the session or two separate sessions were organized on different days. Because the L2 children were administered additional tasks, at least two separate testing dates were organized. This also allowed for the English and French tests to be administered on different dates. All tasks were administered by a native-speaking research assistant of the language in question.

6.3.3 Spontaneous Language

This section provides details concerning the spontaneous language data collection, coding, and analysis. Section (6.3.3.1) describes the context in which the spontaneous language samples were collected. Next, section (6.3.3.2) presents the transcription conventions that were adopted. Section (6.3.3.3) explains the coding procedures and measures which were used to analyze clausal embedding and morphosyntactic accuracy. The coding procedures and measures will be presented for overall morphosyntactic accuracy, verb morphology, object clitics, and grammatical gender.

6.3.3.1 Data collection

The spontaneous language data was collected at the end of the experimental session. The experimenter began the session by asking the child to tell a story based on a wordless picture book containing six pictures (ECL-C, Khomsi & Nanty 2001). This beginning was used only as an ice-breaker after which the research assistant asked the child questions about various topics such as extra-curricular activities, past and future vacations, and their experience moving to France for some of the L2 children. A narrative was elicited by asking each child to describe the events in a book or movie that the child had read or seen recently. Previous studies (Reed 2005) have shown that this type of setting is favorable for eliciting complex syntax.

6.3.3.2 Transcription

Transcription of the spontaneous language sample began at 5 minutes after the beginning of the recording, after which approximately 55-65 utterances were transcribed. Although the number of utterances varied slightly per child, the difference between- or within- groups was not significant.

Transcription and coding were accomplished using Chat conventions (CHILDES, MacWhinney 2000). Much attention was paid to how the utterances were segmented, as this could potentially impact results on certain measures (MLU, number of subordinate clauses per utterance). Following the criteria presented by Rondal (1999), an utterance was considered to be a syntactically and intonationally independent sentence. Therefore, utterance segmentation was based on both syntactic and intonational components. According to syntactic criteria, a verbal utterance contains minimally a conjugated verb and its subject and maximally a matrix clause and its subordinate clauses. Taking into account the intonation criteria, sequences that were not sentences, but were clearly separated from surrounding material by pauses were considered to be separate utterances. A clue for utterance segmentation that was often encountered in our samples was the presence of a coordinating conjunction, which was used to indicate utterance boundary. Sentences separated by coordinating conjunctions were counted as two separate utterances when the coordinating conjunction *et* (and) was employed, unless the child was clearly in the process of listing or unless the intonative curve very strongly indicated that the coordinated constituent should be included as part of the previous utterance. When the conjunctions *mais* (but) and *ou* (or) were produced, the coordinated sentences were considered one utterance, unless intonation strongly indicated otherwise. The following utterances were excluded from the analyses: 1) Utterances consisting of exact repetitions of the same utterance, 2) incomprehensible material, 3) utterances consisting only of the words *yes* or *no*.

Spontaneous language samples were transcribed by native French-speaking research assistants, linguists, and by the author of this thesis (native English speaker). The transcriptions done by non-native speakers were verified in their entirety by a native-speaking assistant or linguist (30 out of 44 files). At least ten percent of all transcriptions were verified by another native speaker. When there were disagreements between two transcribers, decisions were made by committee, often following group discussions.

Concerning the evaluation of morphosyntactic accuracy, grammaticality judgments were provided by research assistants and linguists who were native speakers of French. Very often these decisions were either made by committee or submitted for review by another person. In cases where there was no consensus about a particular production, the utterance was considered targetlike, thus giving the benefit of the doubt to the participant's production. In cases where more than one target production was possible, the target form that represented the fewest number of errors was used.

6.3.3.3 Coding and Measures

This section describes coding system as well as the calculations involved in the measures of clausal embedding and morphosyntactic accuracy that will be presented in Chapter 7. In the first part of this section, the coding procedure and measures of clausal embedding will be presented. Then, coding and measures for morphosyntactic accuracy will be discussed. Accuracy rates for specific forms were generally calculated in three steps involving: (1) the calculation of the number of expected contexts for the form in question, (2) the calculation of the total number of target productions of said form, and (3) the calculation of the percentage correct. These three steps are described below for verbs, object omission and gender.

6.3.3.3.1 Coding and measures of clausal embedding

In order to describe the number and nature of subordinate clauses employed the participants, each utterance was coded according to clause type and level of embedding, as in Loban (1976). The following clause types were coded: 1) matrix clause [PR] as in (81), 2) coordinated clause [CO] as in (81), 3) non-finite complement clause [CN] as in (82), 4) adverbial clause [CIR] as in (84), 5) finite complement clause [CF] as in (83), 6) relative clause [REL] as in (85), 7) Causative clause [CAU] as in (86). Furthermore, each subordinate clause was coded for depth of embedding by adding a number immediately following the clause type code.

(81) il peut [PR] plus marcher mais il peut [CO] faire d'autres choses [...].
He can no-longer walk.INF but he can do.INF of-other things
(JOC, SLI, T1)

(82) il faut [PR] toucher [CN1] quelqu'un.
PRO.IMP must touch.INF someone
(KIB, SLI, T1)

(83) je crois [PR] que tu cours [CF1] très bien.
I believe that you run very well (DAD, L2, T1)

(84) et ils sont [PR] pas vrais en fait parce que c'est [CIR1] des aliens.
and they are not true in fact because it is some aliens
(MER, L2, T1)

(85) c’est [PR] des singes qui vont [REL1] dans l’espace.
it is some monkeys who go in the space
(ELG, SLI, T2)

(86) et après tu le fais [PR] gonfler [CAU1].
and after you cl.ACC.MASC make-inflate.INF (CLH, SLI, T2)

The depth at which the subordinate clauses were embedded was also taken into account. Subordinate clauses which were not embedded in a matrix clause were referred to as zero-level clauses [0], as in (87). Subordinate clauses which were embedded in a matrix clause were labeled level-1 clauses [1], as in (9). Clauses which were embedded within a level-1 clause were coded level-2 clauses [2], as in (10) and so on.

(87) [CP That Max lives in Paris] **Level 0**

(88) Lea believes [CP that Max lives in Paris] **Level 1**

(89) Lea believes [CP that everybody [VP thinks [CP that Max lives in Paris]]] **Level 2**

(from Tuller et al. 2011)

The terms "complex" or "multi-clausal" utterance will be used to refer to an utterance that contains a subordinate clause embedded within a matrix or zero-level subordinate clause. Zero-level clauses and coordinate clauses alone are referred to as "simple" and are not counted as instances of embedding.

Non-finite verbs following modals and aspectual auxiliaries (e.g., *être en train de* 'be in the middle of') were not considered to involve embedding. Modal verbs were defined as those which can only take a non-finite complement clause as its object (and not by a finite complement clause, for example). The following verbs were considered modals and therefore did not imply an embedded clause: *savoir* "to know how to", *pouvoir* "can", *devoir* "must". The principal motivation behind the identification of these verbs as modals was the fact that these verbs cannot take a finite complement clause.

The analysis of the frequency of subordination and level of embedding in the spontaneous language samples was based largely on the four following measures: 1) rate of subordination, 2) rate of complex utterances, 3) clausal density and 4) rate of deep embedding. These measures are detailed in Table 6-9. The rate of subordination, complex utterances and deep embedding are expressed as percentages, whereas clausal density is expressed as a proportion. These measures are interpreted as expressing the following properties: 1) How often subordinate clauses were produced in utterances containing a verb (rate of subordination), 2) how often an utterance contained at least one level-1 or higher subordinate clause (rate of complex utterances), 3) the clause per utterance ratio (clausal density), and 4) the percentage of clauses embedded at level-2 or higher out of all level-1 or higher embedded clauses (rate of deep embedding). In order to take into account the hypothesized differences in complexity of various clause types (see Chapter 5), the relative frequency of different embedded clauses out of the total number of subordinate clauses was also calculated. Because the focus of this study is on the development of embedding, the measures of clausal embedding discussed here involve only clauses embedded at level-1 or higher, unless otherwise specified.

Table 6-9. Calculation of Clausal Embedding Measures

1. Rate of subordination:[68]	Total number of subordinate clauses / Total number of verbal utterances[69]
2. Rate of complex utterances:	Total number of utterances with at least one subordinate clause / Total number of verbal utterances
3. Clausal Density	Total number of clauses (all types, including 0-level) / Total number of verbal utterances
4. Rate of deep embedding	Total number of clauses embedded at level-2 or higher / Total number of subordinate clauses
5. Diversity of Subordination	Total number of a particular subordinate clause type / Total number of subordinate clauses

6.3.3.3.2 Morphosyntactic coding and measures

This section discusses the coding and measures adopted for the analysis of morphosyntactic accuracy. All words from transcribed utterances were coded for syntactic category and other properties. In addition to overall measures of morphosyntactic accuracy, the error analysis will be narrowed down to focus on verb morphology, object clitics, and gender marking, for the reasons detailed in previous chapters. The coding and measures used for these three properties will be presented in more detail in this section. In addition to errors in verb morphology, object clitics, and gender marking, the following morphosyntactic error types (substitution or omission) were also attested and included in the overall morphosyntactic accuracy count:[70] 1) errors on subject pronouns (as in 90), 2) errors in pronominal reference (as in 91, e.g., when the child produces a pronoun that has no identifiable referent), 3) errors

68 Means discussed through this thesis (unless otherwise specified) were calculated based on individual scores from each child participant.
69 Verbal utterances will be used in this thesis to refer to utterances that consist of at least one verb.
70 Lexical errors were also coded, but these were not included in the analysis. The group means for lexical errors (raw numbers) were as follows: L2 T1: *M* = 1.59, *SD* = 1.3; SLI T1: *M* = 0.6, *SD* = 0.9; L2 T2: *M* = 1.27, *SD* = 1.64; SLI T2 : *M* = 0.6, *SD* = 0.8.

in preposition choice (as in 92 and 93), 7) errors in the form of the adverb of negation (as in 94, 96), 8) determiner errors (definiteness) (as in 95), 9) errors in word order (as in 96), and 10) complementizer errors. This list includes substitution, omission, and addition errors.

(90) petit frère **c'** [= il] est chez Maman.[71] (COD, SLI, 11;6, T2)
little brother that [= he] is home Mom
'little brother is at Mom's'

(91) EXP: raconte moi tu vas faire quoi pendant les vacances là qui arrivent?
tell me you go do.INF what during the vacations here that arrive
'tell me what are you going to do during the vacation that's coming up'
ELG: je vais à Nantes.
I go to Nantes
EXP: tu vas faire quoi?
you go do.INF what
'what are you going to do'
ELG: je vais passer des vacances chez **eux**.
I go spend.INF some vacation home them [= Lexical DP]
'I'm going to spend vacation at their house'
(ELG, SLI, T1)

(92) il peut pas aller ø [=à] l'école mercredi et le jeudi.
he can not go.INF [= to] the school Wednesday and the Thursday
(JEM, SLI, T2)

(93) avant elle travaillait à Ancenis **vers** [= avec] les handicapés.
before she was-working in Ancenis towards [= with] the handicapped
(QUL, SLI, T2)

(94) s'il y a **pas** [= rien] on fait un petit cinéma.
if it there has not [= nothing] one does a little movie
'if there is nothing (on tv) we go to the movies'
(ANE, SLI, T2)

(95) on fait **de** [= du] hip hop. (LIB, L2, T1)
one does DET.PART hip hop

(96) mais sauf on a **que** le droit d' avoir trois à la maison [= d'avoir **que** trois]
but except one has only the right to have three at the house [= to have only three]
(ALJ, L2, T2)

[71] The examples presented in this section contain other errors in addition to the example error which is being illustrated. For sake of clarity, only one error per example will be discussed. The error that is the focus of the example is in bold face.

All morphosyntactic errors were coded and included in measures of overall morphosyntactic accuracy. Re-occurring errors were counted each time they were produced. Error frequency will be measured in terms of the **rate of erroneous utterances, i.e., the total number of utterances containing at least one error divided by the total number of utterances.**

6.3.3.3.2.1 Verb Morphology

In the sections focusing on morphosyntactic properties, the coding details for each category are presented first. Second, the error types attested in the data are discussed, and finally the measures that were calculated from the extracted data.

Verbs were initially coded according to whether they were non-finite or finite forms. Non-finite forms included root and embedded infinitives, past participles and gerunds. Finite verbs were then coded according to tense and aspect. The following forms were attested in the corpus collected here: present, compound future, future, imperfect past (*imparfait*), compound past (*passé composé*), the pluperfect past (*plus-que-parfait*), conditional (*cond*) and compound future in the past continuous (loosely interpreted as: “was going to”: *impfutpr*). Subject-verb agreement was coded when verb morphology was phonetically perceptible. Phonetic realizations of subject-verb agreement are relatively infrequent in spoken French (see Section 5.5.3.1 for more details). Despite orthographic differences, the conjugations in the 1st, 2nd and 3rd person singular are often homophonous.

Concerning the measure of accuracy in verb morphology, errors observed in the data included various types. The focus for the present study will be on finiteness, tense choice, and relative proportion of obligatory contexts for different tense types. However, other types found in the data included errors in subject-verb agreement, auxiliary choice in compound past and pluperfect tenses (e.g., the use of the auxiliary *avoir* when *être* was expected), mood, incorrect use of copula (e.g., when the copula *être* was used when *avoir* ‘have’ was expected, as in (97) or when *faire* ‘do/make’ was expected as in (98)). These error types were included in the overall rate of correct verb morphology.

(97) il **est** [= il y a] plein des différentes choses.
it is [= it there has (existential)] a-lot of different things
(EMH, L2, T1)

(98) oui mais **c'est** [= il fait] trop froid.
yes but it is [= it does] too cold

(LAD, L2, T2)

Moving on to more specific errors in verb morphology, errors in finiteness included root infinitives (as in 99) and the omission of verbs in finite contexts (lexical verbs, auxiliaries, copulas, or the existential *il y a*). Verb omissions in a finite context (lexical matrix verb, copula, auxiliary) were counted as an error related to finiteness.

(99) et maintenant plus **faire** [= je fais plus] du sport le lundi. (KIB, SLI, T2)
and now no.longer do.INF some sport the Monday

Errors in tense choice included instances in which, for example, present tense was used in a context where the past was expected. Six total errors in aspect (as in 100) were observed across all children and at both testing times. These were also included in the tense error category.

(100) j'**étais** [= ai été] à l'hôpital.
I was.IMP [= have been (Compound Past)] at the hospital
(LOC, L2, T1)

(101) ma mère elle m' **a emmené** [=emmenait] le mardi en tout cas avec cinq copines […]
my mom she me.cl.ACC has brought the Tuesday in all case with five girlfriends
'my mom brought me on Tuesdays in any case with five girlfriends'
(LUM, SLI, T2)

The measures calculated for accuracy with verb morphology included the following: 1) overall accuracy with verb morphology, 2) rate of correct finiteness, 3) rate of correct present tense choice, 4) rate of correct future and past tense and aspect choice 5) tense diversity. The details of these measures are presented in Table 6-10. Concerning tense and aspect choice, the decision was made to analyze the present tense separately from all other tenses and to analyze the future and past tenses together. The reason behind this decision was twofold: 1) Previous studies (e.g., Paradis & Crago 2000, 2001) have shown that the 3rd person singular present tense form could be considered a type of finite default form in developing grammars of French. Following this reasoning, any expression of future or past tense may indicate differences in developmental stages; 2) Obligatory contexts for the present tense were by far the most frequent tense context. Combining future and past expressions of tense allowed for a greater number of obligatory contexts to be considered. Tense diversity was also used to indicate the frequency of obligatory contexts for the present tense relative to past and future tenses.

Table 6-10. Calculation of Verb Morphology Measures

1. Overall accuracy with verb morphology	Total number of targetlike verbs produced / Number of obligatory contexts (%)
2. Rate of correct finiteness	Total number of finite verb forms produced / Total number of obligatory finite contexts (%)
3. Rate of correct present tense choice	Total number of present tense verbs / Total number of obligatory present tense contexts (%)
4. Rate of non-past tense choice	Total number of correct non-past tense verbs / Total number of obligatory future and past tense contexts (%)
5. Tense diversity	Total number of obligatory present tense contexts / Total number of obligatory finite contexts (%)

6.3.3.3.2.2 Object Clitics

Object clitics, including accusative (*me/te/le/la/les*), reflexive (*me/te/se*), dative (*me/te/lui/leur*), partitive (*en*), and locative (*y*) clitics were coded and analyzed (see Chapter 5 for full paradigms). The error types involved in the production of object clitics generally fell into one of five categories: 1) omission, 2) full DPs in a clitic pronoun context, 3) case, 4) gender, and 5) number.

Measures of object clitic production were calculated out of on the number of obligatory contexts for these pronouns, as what was done for verb morphology. However, the number of contexts in which object clitic production is possible is not always easy to define. Paradis & Crago (2003) used the following definition for object clitic contexts: “Discourse contexts where direct object pronominalization was possible were identified according to the following criterion: the referent was previously mentioned in the near discourse on the same topic (within 5-10 preceding lines of the transcript)” (p.223). Whereas Paradis & Crago used criteria based on the proximity of the referent to the pronoun, in the current study, we used native-speakers to judge the salience of the referent and therefore whether the object clitic could be omitted grammatically or not. Native-speaker judgments allowed us to examine each context qualitatively. For example, this allowed us to take into consideration any other potential referent in the recent discourse that might be in competition for pronominalization with another and which may therefore oblige the speaker to disambiguate using a lexical DP.

In presentation of the results (Chapter 7), the following measures will be used to describe development of object clitics and accuracy in object clitic production: 1) total number of obligatory contexts for object clitics, 2) overall object clitic production, 3) Error type diversity, 4) Total number of third person accusative clitics (3P ACC). As is shown in table 6-11, the calculation of the overall clitic production rate does not include clitics that were produced with incorrect case. However, clitics produced with non-target number or gender errors were counted as an instance of clitic production. So, for example, the production of a dative clitic when an accusative clitic was expected was not counted in the rate of dative clitic production. Concerning the number of obligatory contexts per child, any individual participant with 2 or fewer obligatory contexts for a particular measure was excluded from further analyses involving the same measure.

Table 6-11. Calculation of Object Clitic Measures.

1. Total number of obligatory contexts for object clitics	Total number of contexts in which the production of an object clitic was possible
2. Overall object clitic production	Total number of object clitics / Total number of obligatory contexts for object clitics
3. Error type diversity	Total number of instances for one error type (e.g., omission) / Total number of all errors (excluding number and gender, but including case errors)
4. Overall 3P ACC production	Total number of 3P ACC plural and singular accusative clitics (excludes case errors)

6.3.3.3.2.3 Gender

Gender marking was coded for nouns, adjectives, adverbs and quantifiers (*tout*) when phonetically different feminine and masculine versions existed for a given form. All other determiners and pronouns that do not have phonetically distinct masculine and feminine forms (e.g., the elided definite determiner *l'*, or in the context of a *liaison*)[72] were excluded from this analysis. The decision was made to code gender errors which occurred multiple times with the same noun. This was done because some children used both feminine and masculine markers with the same noun. This will be discussed in more detail in Chapter 7. Moreover, previous studies have analyzed gender assignment (e.g., gender agreement on determiners) separately from gender concord (e.g., gender agreement on adjectives) because

[72] The agreement in liaison contexts is the result of a phonological process.

morphological agreement is assumed to underlie the former and a syntactic operation the latter. However, the decision was made to group these two types of gender marking together in certain overall measures in order to increase the number of contexts for the between-group comparisons. As will be seen in Chapter 7, other gender-related forms, such as the indefinite determiner, will be the subject of closer examination. The gender measures in Table 6-12 will be referred to in Chapter 7. As was the case for object clitics, children with 2 or fewer obligatory contexts for a given measure will be excluded from that particular analysis.

Table 6-12. Calculation of Gender Measures.

1. Overall gender accuracy	All target gender marking on determiners, adjectives, quantifiers and nouns / Total number of obligatory contexts for gender marking
2. Correct masculine	All target masculine gender marking / Total obligatory contexts for masculine gender marking
3. Correct feminine	All target feminine gender marking / Total number of obligatory contexts for feminine gender marking
4. Correct indefinite determiner	All single indefinite determiners with target gender marking / Total number of obligatory contexts for single indefinite determiners

6.3.3.4 Accuracy and embedding measures

Chapters 3 & 5 discussed previous studies showing that complexity is linked to higher error rates (Tuller et al. 2012, Pizzioli & Schelstraete 2008; Simon-Cereijido & Gutiérrez-Clellen 2007). The idea is that if more processing resources need to be allocated towards the derivation of more complex structures (here, an utterances with at least one embedded clause), then fewer resources are available for other calculations involving morphological features. Therefore, the production of an utterance with an embedded clause is predicted to contain errors more often than utterances without an embedded clause. In order to respond to this prediction, error distribution was analyzed in the following ways: 1) Rate of erroneous complex utterances (Number of complex utterances containing at least one error / Number of complex utterances, 2) Rate of erroneous simple utterances (Number of simple utterances containing at least one error / Number of simple utterances.

6.3.4 Statistics

After examination of the different distributions that resulted from the data collection and analysis, the decision was made to use non-parametric tests for statistical analyses. The decision to use non-parametric or parametric statistical tests is often said to depend on whether the particular distribution is normal or not. However, other factors can enter into this decision, such as homogeneity of variances (Larson-Hall 2010). Admittedly, the decision to use one or the other is not entirely straightforward. The heterogeneous quality of groups of children with SLI and L2 children having been established in previous chapters, a substantial amount of variability is expected. As this variability is characteristic of these populations, it seemed more appropriate to include outliers in the analyses. Furthermore, the relatively smaller number of participants also seems to favor the use of non-parametric tests. The distributions that will be presented in the following chapter differ from one measure to another and from group to another in terms of their normality and homogeneity. For simplicity's sake, it seemed more appropriate to use the same type of statistical tools throughout. Therefore, non-parametric tests will be used for statistical analyses, including the *Kruskal-Wallis* one-way analysis of variance for the multiple comparisons (*H*), the *Mann-Whitney U test* for independent measures for between-group differences, the *Wilcoxon* matched-pairs signed ranks test for longitudinal or within-group differences (*Z*), the Chi-square test with Yates correction for proportions (χ^2) and *Spearman's rho* for correlation analyses.

The results presented in the following chapter are often based on multiple comparisons (of a maximum of four groups: SLI, L2, TD4, TD8+11). Statistical manuals warn that performing more than one test on a set of data can increase the risk of making a "Type 1" error (rejecting the null hypothesis when it is true) (Larson-Hall 2010). Various parametric post-hoc tests automatically adjust p-values when multiple comparisons are made (e.g. Tukey's HSD); however, non-parametric tests such as the Mann-Whitney *U* test for independent measures and the Wilcoxon matched-pairs signed ranks test do not include an adjustment for multiple comparisons. However, adjustments such as the Bonferroni correction can be applied manually to the *p*-value of a given non-parametric test result. The Bonferroni correction decreases the alpha according to the number of comparisons being made. So, if the SLI, L2, TD4 and TD8+11 groups are being compared to each other, there are six total comparisons being made. Using the Bonferroni correction with six comparisons would mean that the upper limit for significance would be 0.0083 (=0.05/6). However, the Bonferroni correction has been criticized as being too conservative and various other proposals have been put forward to deal with multiple comparisons (e.g., Benjamini & Hochberg's (1995) False Detection Rate, cited by Larson-Hall 2010). Of course, if the alpha is set too low, then the risk of making a "Type II" error (accepting the null hypothesis when it is false) increases. A possible twist on the application of the Bonferroni correction is to allocate the alpha unequally across comparisons (Abdi 2007, citing Rosenthal & Rosnow 1985). Because the Bonferroni correction says that the sum of the alpha of each comparison should be equal to the alpha that is typically used to determine significance for one comparison (here, 0.05), a comparison that is deemed important *a priori* can be attributed a higher alpha risk than the others, as long as the sum equals 0.05. As was made clear in the previous chapters, the SLI-L2 is the main comparison we are interested in in the analyses conducted in this thesis. Therefore, when multiple comparisons were being made, we have decided to consider the SLI-L2 statistical test results as significant at the 0.04 level. The other five comparisons will be considered significant at 0.002 level (0.05-0.04 = 0.01; 0.01/5 comparisons = 0.002). In any case, *p* values with or without the Bonferroni correction will be reported and considered in the interpretation of the results.

7 Results

7.1 Introduction

The current chapter presents the results of standardized tests and analyses of spontaneous language samples which were obtained from the L2 and SLI populations whose characteristics were described in Section 6.2. This chapter is organized as follows: In Section 7.1 the L2 and SLI performance on standardized assessments will be presented. The impact of L2 factors such as LoE, AoO, performance in the L1 and working memory on L2 performance on standardized language measures will be examined in Section 7.2.6. The analyses of clausal embedding in spontaneous language will be explored in Section 7.3.2-7.3.3. An error analysis focused on overall morphosyntactic accuracy, verb morphology, object clitics, and grammatical gender will be undertaken in Section 7.3.5. The link between overall error rates and clausal embedding will be presented in Section 7.3.6. Section 7.4 focuses on the link between factors such as LoE, AoO, L1 performance, and working memory and the spontaneous language data in the L2 population. Finally, Section 7.5 presents an interpretation of the L2 standardized test scores in light of the L2 spontaneous language measures.

7.2 Standardized Tests

This section discusses the performance of the L2 and SLI on several different standardized assessments. Previous studies have shown that these two different learner groups do not perform well compared to the TD monolingual norm-referencing populations that are used for standardized assessment creation. This section therefore seeks to find out if the same pattern will be found in the current population. At the end of this chapter (Section 7.5) standardized test results will also be compared with spontaneous language performance to see if the standardized tasks underestimated the performance of the L2 population. Sections 7.2.1 and 7.2.2 present the results from two French tests evaluating sentence completion and word repetition, respectively. In sections 7.2.3 and 7.2.4, digit span scores in French and English will be reported. Section 7.2.5 examines the question of the performance of the L2 children in their L1 via the results of the CELF. Then, Section 7.2.6 explores the link between L2 factors and standardized test scores.

In the French clinical context, a z-score of -1.65 *SD* is often used as the cutoff for pathological language performance. The CELF and the WISC-IV, however, recommend a cutoff score of -1 *SD*. Therefore, for the French standardized tests, particular attention will be paid to z-scores falling below -1.65 *SD* and between -1 *SD* and -1.65 *SD*. For the CELF and WISC, scores under -1 *SD* will be considered atypical performance. When comparing the SLI and the L2 on the results of the French standardized assessments, the factor of chronological age will receive special attention. This will be done by dividing the populations into age groups (which are dubbed "SLI 6-9", "SLI 9-12"; "L2 6-9"; "L2 9-12"; see methodology, Section 6.2.3 for more details) and will address the question concerning the comparability of older children with SLI and L2 children.

7.2.1 Sentence Completion

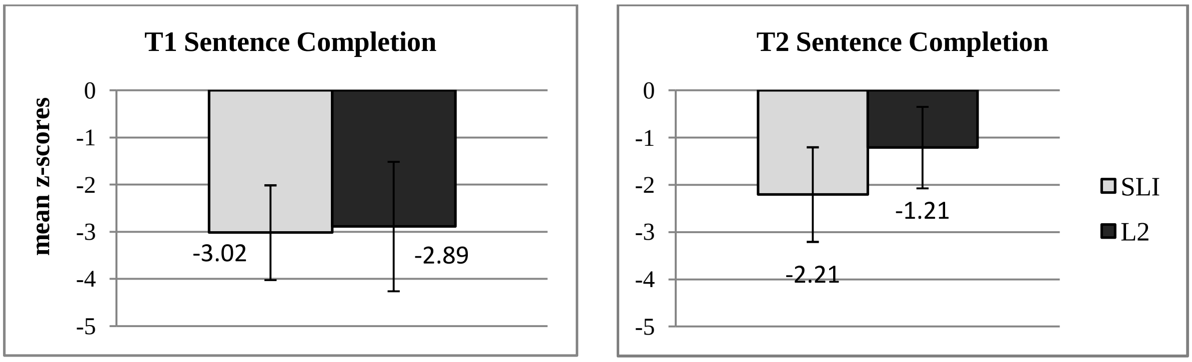
Recall from the method chapter (Section 6.3.1.1) that morphosyntax in French was evaluated in the L2 and SLI groups via a standardized sentence completion task. The results from this standardized measure will be presented in this section. Figure 7-1 shows the means per group (see Section 7.5 for the L2 children's individual results). Between-group comparisons revealed no significant differences between the two groups at T1 (T1: U = 198, p = 0.76). At T1, 14 L2 children (64% of the group) and 15 children with SLI (80% of the group)[73] had z-scores which were below -1.65. Two L2 children and two children with SLI scored between -1 and -1.65.

The L2 group displayed significant longitudinal progression from T1 to T2 (Z = 3.07, p < 0.01), whereas the SLI scores increased from T1 to T2, but this difference barely missed significance (Z = 1.93, p = 0.053). As can be seen in Figure 7-1, the group mean for the L2 at T2 is higher than the cutoff of -1.65, which also suggests progression on the part of the L2 population from T1 to T2. Nevertheless, the mean z-score at T2 for the SLI group was not significantly different from the L2 (U = 144, p = 0.089). Despite the apparent improvement in the L2 group mean, on an individual level, 9 L2 children (41% of the group), as well as 9 children with SLI (47% of the group) scored below -1.65 *SD* at T2. The children with the longest exposure to French in the L2 group might be expected to have scores within the norm. However, this was often not the case: 6 out of the 9 L2 children with more than 3 years exposure scored below -1.65 in the sentence completion at T1 (HEA, IOC, LAD, ALP, LEP, BEA) and 4 out of 9 did so at T2 (ALP, BEA, LAD, LEP). If we include all of the children

[73] These proportions were not significantly different (χ^2 = 0.04, p=0.84).

who have > 3 years exposure at T2, then 6 out of 14 children with relatively long exposure scored below the cutoff (ALJ, ALP, BEA, LAD, LEP, SAJ) (see Section 7.5 for individual scores).

Figure 7-1. Mean Sentence Completion Z-Scores in the L2 and SLI at T1 and T2.



Sentence completion z-scores were not correlated with CA in either group at T1 (L2: r_s = -0.025, p = 0.91; SLI: r_s = -0.17, p = 0.47), but this correlation reaches significance at T2 in the SLI (SLI: r_s = 0.46, $p < 0.05$; L2: r_s = -0.025, p = 0.91). As can been ascertained from Tables 7-1 and 7-2, performing age group comparisons reveals similar performance for sentence completion z-scores at T1 for both age groups (SLI 6-9 vs. L2 6-9: U = 41, p = 0.74; SLI 9-12 vs. L2 9-12: U = 60, p = 0.97) and at T2 for the older groups (SLI 9-12 vs. L2 9-12: U = 52, p = 0.58), but the L2 6-9 had significantly higher scores than the SLI 6-9 at T2 (SLI 6-9 vs L2 6-9: U = 21, $p < 0.05$).

Table 7-1. Mean Sentence Completion Z-Scores per Age Group at T1.

T1 Sentence Completion				
	SLI 6-9	**L2 6-9**	**SLI 9-12**	**L2 9-12**
M	-3.5	-3.2	-2.6	-2.5
SD	*2.7*	*2.8*	*1.1*	*2.7*

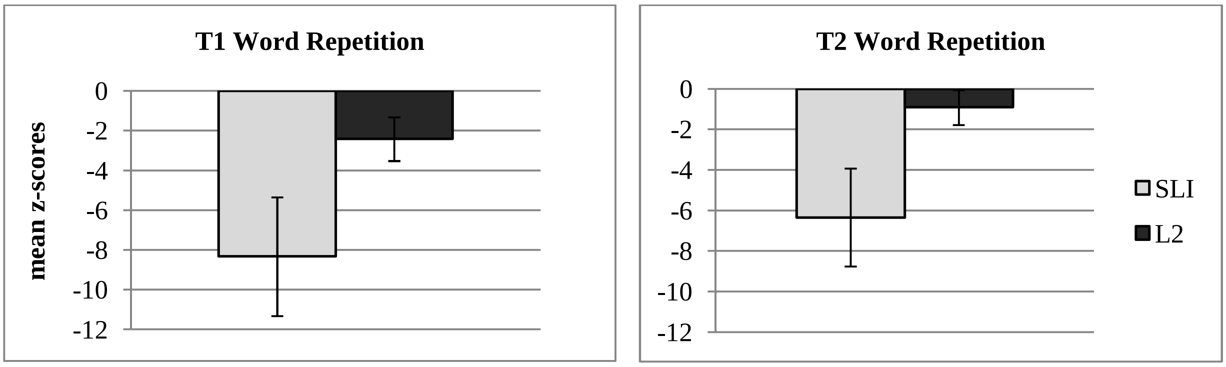
Table 7-2. Mean Sentence Completion Z-Scores per Age Group at T2

T2 Sentence Completion				
	SLI 6-9	**L2 6-9**	**SLI 9-12**	**L2 9-12**
M	-3.2	-1.5	-1.3	-0.97
SD	*2.2*	*1.8*	*1.5*	*1.7*

7.2.2 Word Repetition

As explained in Section 6.3.1.2, word repetition was tested using a standardized (real) word repetition task. Whereas the L2 and SLI patterned together for sentence completion, the L2 have significantly higher scores in word repetition than the SLI at both T1 and T2, as can be seen in Figure 7-2 (T1: $U = 69$, $p < 0.001$; T2: $U = 4.46$, $p < 0.0001$). Although the L2 have significantly stronger performances than the SLI, there are 11 L2 children with z-scores below -1.65 *SD* at T1, 4 who score between -1 and -1.65 and 7 who score above -1 *SD*. At T2, there are still six L2ers below -1.65 (ALP, EMH, HAS, LAD, MAS and SAJ), four between -1 and -1.65 (LOS, MER) (the remaining 12 are above -1). Despite the significantly higher scores compared to the SLI, these individual results show that a certain number of L2 children nevertheless score below the cutoff for the clinical population (see Section 7.5 for all individual scores). As was the case for sentence completion, a couple of L2ers with relatively long exposure performed poorly on the word repetition assessment. Three of the nine L2 children with at least 3 years exposure scored below -1.65 in word repetition at T1 (BEA, HEA, LEP) and two of the nine L2 children with > 4 years of exposure at T2 scored below the cutoff (ALP, LAD). At T2, three out of fourteen L2 children with at least > 3 years exposure at T2 also scored below the cutoff (ALP, LAD and SAJ).

Figure 7-2. Mean Word Repetition Z-Scores in the L2 and SLI at T1 and T2.



No significant correlations between CA and word repetition z-scores were found in the L2 group at T1 or T2 (T1: r_s = -0,07; p = 0,76; T2: r_s = -0,02; p = 0,91). The same is true for the SLI (T1: r_s = 0,18, p = 0,46; T2: r_s = 0,4, p = 0,12). With respect to age group comparisons, the pattern observed in the overall groups is the same in the younger and older age groups[74] (see Tables 7.3 and 7.4).

Table 7-3. Word Repetition Z-Scores by Age Group at T1.

T1 Word Repetition				
	SLI 6-9	**L2 6-9**	**SLI 9-12**	**L2 9-12**
M	-10.53	-2.75	-6.35	-2.15
SD	*7.8*	*2.7*	*2.9*	*1.8*

Table 7-4. Word Repetition Z-Scores by Age Group at T2.

T2 Word Repetition				
	SLI 6-9	**L2 6-9**	**SLI 9-12**	**L2 9-12**
M	-8.29	-0.71	-4.60	-1.08
SD	*5.9*	*0.78*	*2.9*	*1.3*

The z-scores for word repetition and sentence completion correlated positively with each other in both groups at T1 (SLI: $r_s = 0.61$, $p < 0.01$; L2: $r_s = 0.69$, $p < 0.001$) and at T2 for the SLI ($r_s = 0.71$, $p < 0.001$), but the correlation in the L2 does not quite reach significance at T2 ($r_s = 0.39$, $p = 0.073$). Generally speaking, those children who did well on the sentence completion task also did well on the word repetition task.

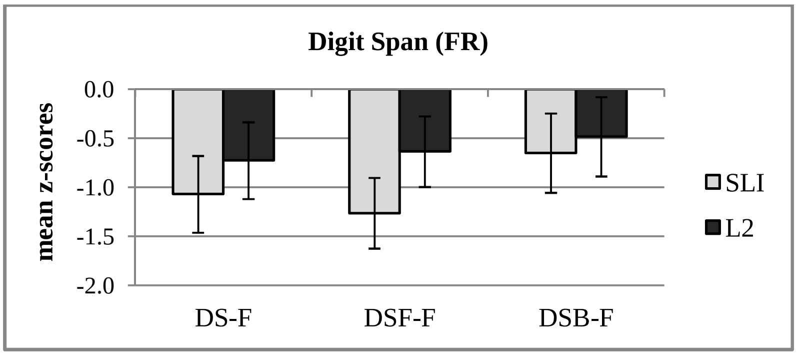
7.2.3 Digit Span (French)

Recall from the method section that the digit span task from the WISC-IV (Wechsler 2003) was used to measure memory. The scores from this task include the total score (DS), the forwards and backwards spans (DSF and DSB respectively). The forward span is typically interpreted as measuring short term memory, while the backwards span measures working memory. For the L2 group, both the French (DS-F) and English versions (DS-E) were administered. Although all other tasks were administered at both T1 and T2, the digit span task was administered at T2 only.

[74] (T1: SLI 6-9 vs. L2 6-9: $U = 14$, p <0,05; SLI 9-12 vs. L2 9-12: $U = 11$, $p < 0.01$; T2: SLI 6-9 vs. L2 6-9: $U = 13.5$, $p < 0.01$; SLI 9-12 vs. L2 9-12 $U = 13.5$, $p < 0.01$)

As can be seen from Figure 7-3, group results for the French version show that both the SLI and the L2 consistently have mean z-scores of < -0.5 when compared to the norm-referencing population. However, the SLI generally appear to have weaker performance than the L2 on the DS-F total score and the DSF-F test. Despite the numerically higher performance in the L2 group, the only significant difference between the SLI and the L2 was found for the forward span (DSF-F z-score: $U = 132$, $p < 0.05$).

Figure 7-3. Mean Digit Span Scores in French in the L2 and SLI at T1 and T2.



A glance at Tables 7-5 reveals that the overall group pattern described above is more or less repeated when age groups are compared. Again, the L2 have scores which are consistently higher than the SLI for DS-F and DSF-F, but these differences are not all significant. The only significant difference concerned forward span z-scores (DSF-F) between the SLI 6-9 and the L2 6-9 ($U = 1.99$, $p < 0.05$).

Table 7-5. Digit Span Scores in French by Age Group.

Digit Span (FR)								
		SLI 6-9	**L2 6-9**	***p***	**SLI 9-12**	**L2 9-12**	***p***
DS-F (z-score)	**M**	-1.11	-0.67	ns	-1.03	-0.78	ns
	SD	*0.60*	*0.54*		*0.87*	*0.96*	
DSF-F (z-score)	**M**	-1.26	-0.60	< 0.05	-1.27	-0.67	ns
	SD	*0.89*	*0.49*		*0.89*	*0.89*	
DSB-F (z-score)	**M**	-0.44	-0.30	ns	-0.84	-0.64	ns
	SD	*0.67*	*0.76*		*0.79*	*0.85*	

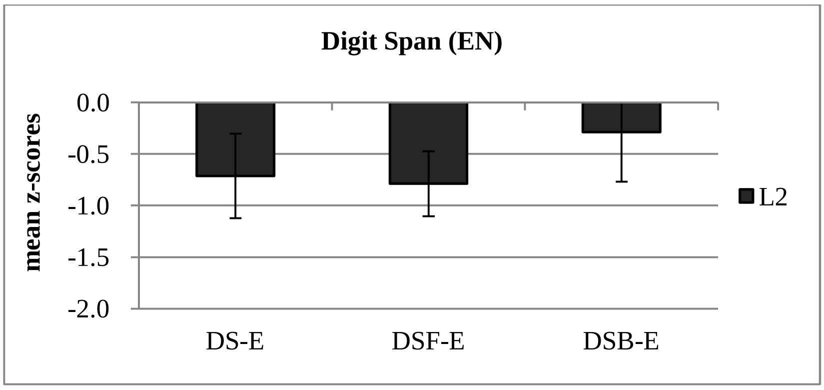
In the SLI, the total digit span (DS-F) z-score correlated positively and significantly with word repetition and sentence completion z-scores (T2: word repetition and DS: $r_s = 0.71$, $p < 0.05$; T2 sentence completion and DS: $r_s = 0.51$, $p < 0.01$). However, in the L2 group, no significant correlations were observed between the French digit span scores (total, forwards or backwards) and the French standardized measures.

Looking at the individual total DS-F z-scores in the L2 group, there were seven L2 children who scored below -1 *SD* (ALP, EMH, HEA, HOS, LEP, RHR and SAJ) and 15 who scored above -1. In the SLI group, seven children scored below -1 *SD* and 12 scored above -1. Although there were only a few marginally significant differences between the two populations, the group results seem to suggest that the L2ers had somewhat stronger scores that the SLI in the forward digit span. However, individual results reveal considerable overlap between the two populations for this task in terms of the number of children who had z-scores below -1 (L2: n = 7/22 (32%); SLI: n = 7/19, (36%)).

7.2.4 Digit Span (English)

Comparisons within the L2 group revealed that these children had similar digit span scores regardless of the language in which the task is administered. The group scores for the Digit Span in English are displayed in Figure 7.4 The scores that the L2 group obtained for the French version did not differ significantly from the results obtained with the English version (DS-F vs. DS-E: Z =0.28, p = 0.78).

Figure 7-4. Digit Span Z-Scores in English in the L2 Group.



With respect to individual results, some of the same children who did poorly on the French digit span task also had very low scores on the English task. Those children with total digit span scores in English (DS-E) at or below -1 are EMH (-2.76), HAS (-1.67), HEA (-1), LOS (-1), RHR (-1.33) and SAJ (-2.76). Table 7-6 shows that most children had higher z-scores in the English task; however, 5 children exhibited the opposite pattern (ALJ, EMH, HAS, IOC, and MER).

Table 7-6. Digit Span Z-Scores in French and English in the L2 Group

Digit Span Z-Scores					
Child	Age T2	AoO	LoE T2	DS-F	DS-E
RHR	7;9	4;9	2;11	**-1.3**	**-1.3**
PUS	8;1	4;6	3;8	**-1.0**	-0.67
LOS	8;4	6;6	1;10	**-1.0**	**-1.0**
ALC	8;4	5;9	2;7	-0.7	-0.7
ALJ	8;10	5;6	3;4	0.0	-0.7
BEA	9;8	5;4	4;5	-0.7	-0.7
IOC	9;9	5;1	4;8	0.3	0.0
WRS	9;10	6;2	3;8	-0.7	-0.7
LEP	10;2	6;0	4;2	**-1.3**	-0.3
HAS	10;0	8;2	1;10	-0.3	**-1.7**
EMH	10;3	8;4	1;11	**-1.3**	**-2.7**
LAD	10;6	5;10	4;8	0.0	0.0
MER	10;10	7;11	2;11	0.7	-0.7
HEA	11;1	6;8	4;5	**-1.3**	**-1.0**
HOS	11;8	8;1	3;8	**-1.3**	-0.3
SAJ	12;3	8;4	3;11	**-2.7**	**-2.7**
DAD	12;3	7;7	4;8	0.3	0.7
MAS	12;4	10;5	1;10	0.0	0.3
LIB	12;8	7;8	4;11	**-1.0**	-0.7
RAG	13;1	8;2	4;11	-0.7	-0.3
LOC	13;3	10;9	2;6	-0.3	0.0
ALP	13;8	9;7	4;2	**-1.7**	-0.7
M	-	-	-	-0.73	-0.71
SD	-	-	-	*0.78*	*0.82*

X: score below -1 *SD*; **XXX:** children with scores below the cutoff in both languages

7.2.5 L1 Skills (CELF)

As explained in the methodology chapter (Section 6.3.1.4), a battery of tests in English (CELF) was administered to the L2 group. The total score (Core Language Score: CELF-CLS) obtained from the subtests can be used as a potential indicator of atypical language performance. According to the authors of the test, if a child performs below -1 *SD*, he or she should undergo further evaluation for a potential language problem. In Section 7.2.1, it was reported that 14 L2 children scored below the cutoff of -1.65 for the test of sentence completion in French. For L1 performance, ten L2 children had CELF-CLS scores at -1 or lower at T1 (ALP, EMH, HAS, IOC, LEP, MER, PUS, RHR, SAJ, WRS) (see Table 7-7).

The group CLS scores at T2 were not significantly different from T1 ($Z = 0.84$, $p = 0.40$). There were no significant differences for three out of the four subtests.[75] In other words, there was no improvement or regression in L1 performance from T1 to T2. At T2, six children scored below -1 (ALP, HAS, LEP, PUS, SAJ, WRS). This means that four children (EMH, IOC, MER and RHR) performed below the cutoff at T1, but within norms at T2, as can be seen in Table 7-7. Although some children obtained lower scores at T2, no children performed in the normal range at T1, but below the cutoff at T2.

Table 7-7. CELF-CLS Scores at T1 and T2 in the L2 Group.

CELF-CLS Z-Scores					
Child	Age T1	AoO	LoE T1	CELF-CLS T1	CELF-CLS T2
RHR	6;9	4;9	1;11	**-1.3**	-0.9
PUS	7;1	4;6	2;7	**-3.2**	**-2.8**
LOS	7;4	6;6	0;11	0.6	-0.3
ALC	7;4	5;9	1;7	0.4	0.1
ALJ	7;8	5;6	2;3	0.8	0.1
BEA	8;9	5;4	3;5	-0.6	-0.4
IOC	8;9	5;1	3;8	**-1.5**	-0.5
WRS	8;9	6;2	2;7	**-1.9**	**-1.0**
LEP	9;0	6;0	3;1	**-1.2**	**-1.5**
HAS	9;1	8;2	0;11	**-1.2**	**-1.2**
EMH	9;4	8;4	0;11	**-1.1**	-0.7
LAD	9;7	5;10	3;8	0.5	-0.1
MER	9;10	7;11	1;11	**-1.0**	-0.8
HEA	10;1	6;8	3;5	-0.7	-0.6
HOS	10;8	8;1	2;7	0.5	-0.1
SAJ	11;1	8;4	2;9	**-3.1**	**-2.0**
DAD	11;3	7;7	3;9	0.5	0.8
MAS	11;4	10;5	0;11	0.1	0.3
LIB	11;8	7;8	4;0	0.1	0.0
RAG	12;0	8;2	3;11	0.6	1.4
LOC	12;3	10;9	1;5	0.8	0.8
ALP	12;7	9;7	3;1	**-1.2**	**-1.4**
M	-	-	-	-0.6	-0.5
SD	-	-	-	*1*	*1*

X : score below -1 SD; **XXX** : children with scores below the cutoff at T1 and T2

[75] The L2 progressed for the subtest *Concepts and Following Directions* (CFD) from T1 to T2 ($Z = 2$, $p < 0.05$).

As discussed in Chapters 2 and 4, L2 children are disadvantaged by standardized assessments which use monolingual norm-referencing populations. This can be the case for assessments in both the L1 and the L2. The standardized sentence completion and working memory results generally showed that some L2 children scored below norms, like children with SLI are expected to do. However, since these assessments are known to put L2 children at a disadvantage, the question becomes how to interpret their performance. Strikingly, the standardized assessments in French and English revealed that the L2 children ALP and SAJ consistently had very low scores on almost all tasks. The status of these particular children will be revisited in Section 7.5 at which time the individual results from the standardized tests will be compared to the results from the spontaneous language samples. The following section explores the link between L2 factors and performance on standardized tests.

7.2.6 L2 Factors

This section examines the role of factors that could potentially account for the variability in the L2 performance. The idea is to see whether correlation analyses indicate an association between these factors and performance on standardized tests. The factor of chronological age having been explored earlier in the direct comparison of the L2 and SLI populations, this section will focus more closely on LoE, AoO, L1 performance and working memory.

7.2.6.1 LoE

A handful of significant correlations between length of exposure and other language measures were observed in the L2 population. LoE was found to be significantly correlated with sentence completion and word repetition <u>raw</u> scores at T1 and T2, but not with z-scores.[76] In other words, the L2ers with longer exposure had higher raw scores for these tests, but this did not necessarily mean that these scores were appropriate for their age (compared to the monolingual norms).

L1 attrition has been documented in L2 child populations, but the question of what role the factor of LoE plays in attrition is not quite understood either (Montrul 2008b). Was there an observable impact of LoE on L1 as well as L2 performance? With respect to L1 performance,

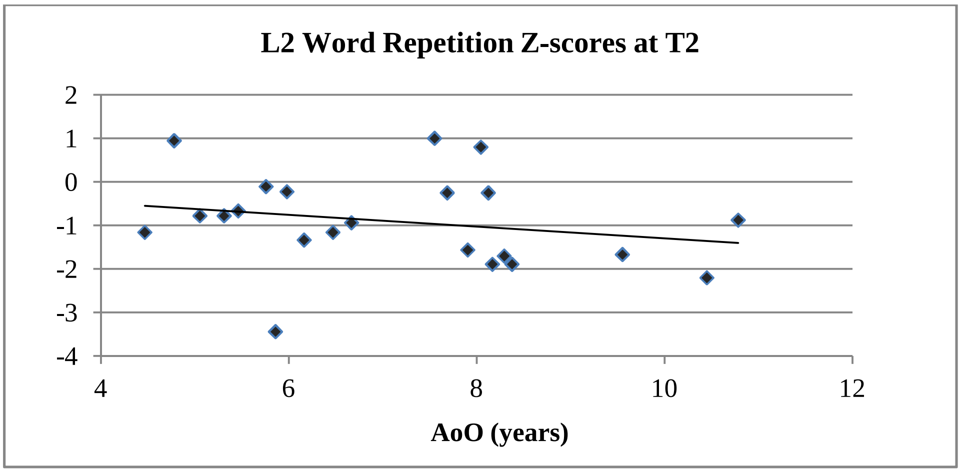
[76] T1 LoE & sentence completion z-scores: r_s = 0.33, p = 0.14; T1 LoE & word repetition z-scores: r_s = 0.21, p = 0.34; T1 LoE & sentence completion raw scores: r_s = 0.69, p < 0.001; T1 LoE & word repetition raw scores: r_s = 0.60, p < 0.01; T2 LoE & sentence completion z-scores: r_s = 0.22, p = 0.34; T2 LoE & word repetition z-scores: r_s = 0.33, p = 0.14; T2 LoE & sentence completion raw scores: r_s = 0.43, p < 0.043; T2 LoE & word repetition raw scores: r_s = 0.55, p < 0.01.

LoE did not appear to be associated with CELF scores, as evidenced by the lack of significant correlations between these two variables (T1: r_s = -0.025, p = 0.91; T2: r_s = 0.09, p = 0.68). In other words, the performance in the L1 of the L2 population was not linked to their time exposed to the L2.

7.2.6.2 AoO

Following the critical period hypothesis (see Chapter 2), children with an earlier age of onset are more likely to be successful in L2 acquisition compared to individuals with a later AoO. However, the impact of AoO appears to be minimal with respect to the performance of the L2 children studied here. AoO was not correlated significantly with any standardized test measure; however, there was a tendency towards a negative correlation between AoO and the word repetition z-scores at T2 (r_s = -0.399, p = 0.066), as can be seen in Figure 7.5. Out of the six children with an AoO of 7;6 or above and who have scores below -1.65, three children have only 0;11 months exposure (EMH, HAS and MAS). Overall, there is very little evidence for the impact of AoO on the standardized measures collected in this study.

Figure 7-5. Word Repetition Z-scores with Respect to AoO at T2 in the L2 Group.



7.2.6.3 Working Memory

As discussed in Chapter 3, one hypothesis about the nature of SLI has proposed to consider that the impairment stems from deficits in working memory. Studies on child L2 development have begun investigating working memory capacity in L2 children; however, as pointed out by Marinis & Chondrogianni (2011) the link between linguistic performance in the L2 and working memory capacity has not yet been studied systematically.

In the current study, working memory was measured via a digit span task administered in both the L1 and the L2. The link between working memory and performance in the L2 and L1 was explored via correlation analyses between the digit span and other measures in French and English. Looking at the link between the French digit span and French language measures, scores on the word repetition and sentence completion tasks did not correlate with the French digit span scores in the L2 population. It is perhaps interesting to note here that these same scores were correlated significantly in the SLI group (DS-F and Word Rep.: $r_s = 0.5$, $p < 0.05$; DS-F and sentence completion: $r_s = 0.6$, $p < 0.01$). In the L2 population, one significant correlation was found between the digit span scores in English and the standardized scores in French: DSB-E correlated significantly with the French word repetition z-score ($r_s = 0.43$, $p < 0.05$).

Concerning digit span scores in English and performance on the CELF, a number of significant correlations were found. For example, there was a significant positive correlation between the CELF-CLS and the total digit span score in English (DS-E) (CELF-CLS and DS-E: $r_s = 0.57$, $p < 0.01$) and between the CELF-CLS and the backwards digit span (DSB-E) (CELF-CLS and DSB-E: $r_s = 0.75$, $p < 0.0001$). There was also a marginally significant correlation between the CELF-CLS and DS-F ($r_s = 0.5$, $p < 0.05$). These results are perhaps unsurprising, given the description and objectives of the CELF subtests, which have a strong memory component (see Chapter 6.3.1.4). The Recalling Sentences (sentence repetition) subtest z-scores correlated significantly with the DSB-E ($r_s = 0.6$, $p < 0.01$), but with no other digit span score in French or English. The backwards span is assumed to target working memory capacity; whereas, the forwards span is assumed to be a measure of short term memory (Gathercole & Pickering 2000). Therefore, it may be the case the Recalling Sentences and backwards digit span tasks rely on the same aspect of working memory.

7.2.6.4 L1 Skills

Overall aptitude for language has often been considered a factor for success in L2 acquisition, although most research on this subject has been done on adult L2 acquisition (see Gass & Selinker 2001). Nevertheless, a similar question can be asked about L2 children. Are those who obtain strong scores in their L1 expected to have strong performance in their L2 as well? In order to investigate this, correlation analyses were performed between the CELF and other standardized tests in French. These analyses revealed significant positive correlations between the Recalling Sentences subtest of the CELF and the sentence completion task ($r_s = 0.56$, $p <$

0.01) as well as the word repetition task for French (r_s = 0.58, p < 0.01). These correlations were significant at T1 only; however, they seem to suggest that success on the standardized L1 assessment is linked to success on standardized test performance in the L2, or that the two tasks are tapping into the same capacity.

Summarizing the results presented thus far, analyses of the sentence completion task revealed similar performances in the SLI and L2 at both T1 and T2. Individual results at T1 showed that over half of the L2 and SLI population scored below the z-score of -1.65, which is often the cutoff used by clinicians in France to distinguish typical from impaired performance. The L2 children improved significantly from T1 to T2 on the sentence completion task; however, 40% of L2ers still obtained scores below the cutoff at T2, some of whom had relatively long exposure at T2. More specifically, 6 out of 14 L2 children with > 3 years exposure at T2 scored below the cutoff (ALJ, ALP, BEA, LAD, LEP and SAJ) for the standardized sentence completion task.

The comparative results for the word repetition task revealed that the L2 had significantly higher scores than the SLI at both T1 and T2. Although the L2 children did not overlap with the SLI for phonology as a group, there were certain L2 children with more than three years exposure who scored below the cutoff for this task (T1: BEA, HEA, LEP; T2: ALP, LAD and SAJ).

The digit span task results revealed that the SLI and the L2 do not have radically different performance in tasks targeting short term and working memory. The L2 had consistently higher z-scores than the SLI, but these differences were only marginally significant for the forwards digit span task. The digit span task group results in French and English showed that L2 children had similar scores in both languages. Most children had higher z-scores for the English task, but this was not the case for 5 of the L2ers.

The number of L2 children who did not perform within the age-appropriate norms on the English assessment (CELF) included almost half of the population at T1 and almost one-third of the population at T2. The overall results from this section reveal that, when compared to a monolingual norm, the L2 and the SLI generally have similar performance. Furthermore, a considerable proportion of the L2 group also has weak performance in tasks which evaluate their L1.

7.3 Spontaneous language results

This section presents the results obtained via spontaneous language analyses. This section is organized as follows: In Section 7.3.1, the results for MLU will be reported. In the following section (7.3.2), measures targeting the frequency of clausal embedding will be investigated. Section 7.3.3 will look into the types of subordinate clauses that were used most frequently. For the analysis of clausal embedding, group comparisons will be made across the following groups: L2, SLI, TD8+11, and TD4. As was done for the standardized test measures, age group differences will also be investigated for various measures. As mentioned in the methodology chapter (Section 6.3.4), differences found between the L2 and SLI will be considered significant at the 0.04 level. Other group differences will be considered significant 0.002, after applying a Bonferroni correction.

Because of the heterogeneity inherent in the SLI and L2 groups, an effort was made to analyze individual as well as group results. Individual rates for measures of clausal embedding were compared to the following distributions: 1) -1 *SD* of the TD4 mean, 2) -1 *SD* of the TD8+11 mean and, 3) -2 *SDs* of the TD8+11 mean. The choice of 1 or 2 *SDs* is not a completely straightforward decision. The TD4 were used as approximate language controls and therefore, the SLI and L2 might be expected to pattern more closely to the TD4 than the TD8+11. The decision was made to compare the L2 and SLI rates to -1 *SD* and -2 *SD* of the TD8+11 distribution because, as approximate age controls, the TD8+11 are expected to use clausal embedding more frequently than the L2 and SLI. Therefore, the goal with the TD8+11 comparison was to identify SLI and L2 individuals that patterned closely with the TD8+11 (i.e., within 1*SD*) and those whose performance was well outside of the TD8+11 distribution (i.e., < 2 *SDs*).

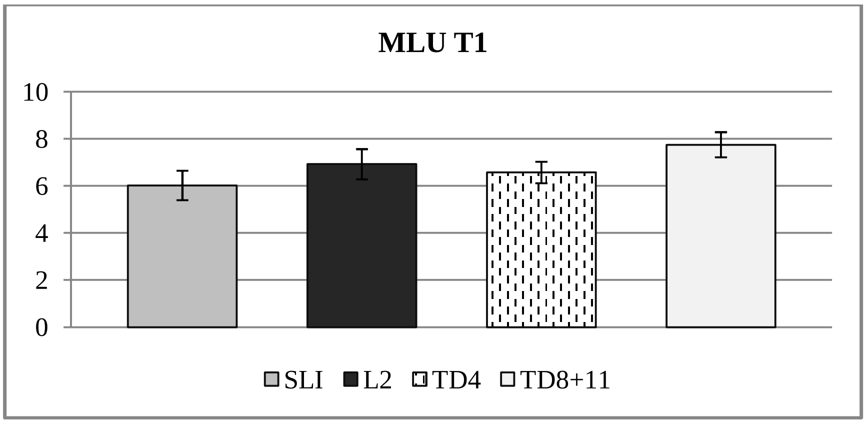
7.3.1 MLU

7.3.1.1 MLU group results

Prior work on SLI-L2 comparisons has often matched children with SLI to L2 children on the basis of MLU (Paradis & Crago 2000; Paradis 2004); however, the children in the current study are matched on mean age only. For the purposes of this thesis, MLU will be interpreted as a general characteristic of the spontaneous language samples that can potentially contribute to the distinction between the SLI and the L2.

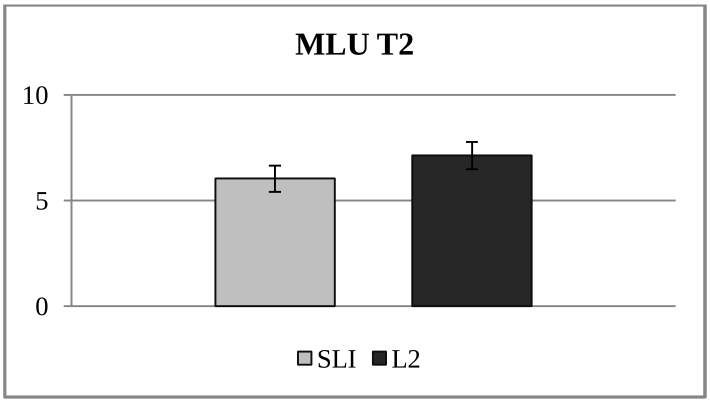
Figure 7.6 presents the results for MLU at T1 and Figure 7.7 at T2. The results of a Kruskal-Wallis revealed a significant group effect for MLU at T1 (H (3, 79) = 19.95, $p < 0.001$) and at T2 (H (3, 79) = 20, $p < 0.001$). At T1, a Mann-Whitney U test showed that, for MLU, the L2 performance was significantly higher than the SLI (U = 128; p = 0.034). Concerning the comparison with the TD groups, neither the SLI nor the L2 differed significantly from the TD4 group (SLI & TD4 U = 92, p = 0.14; L2 & TD4 U = 119, p = 0.26). However, the SLI had significantly lower MLUs than the TD8+11 (U = 69.5 $p < 0.0001$). The L2 group had lower MLUs than the TD8+11 at T1 (U =65, p = 0.018), but this difference is only significant without the Bonferroni correction ($p < 0.002$).

Figure 7-6. MLU at T1 in the SLI, L2, TD4 and TD8+11 Groups.



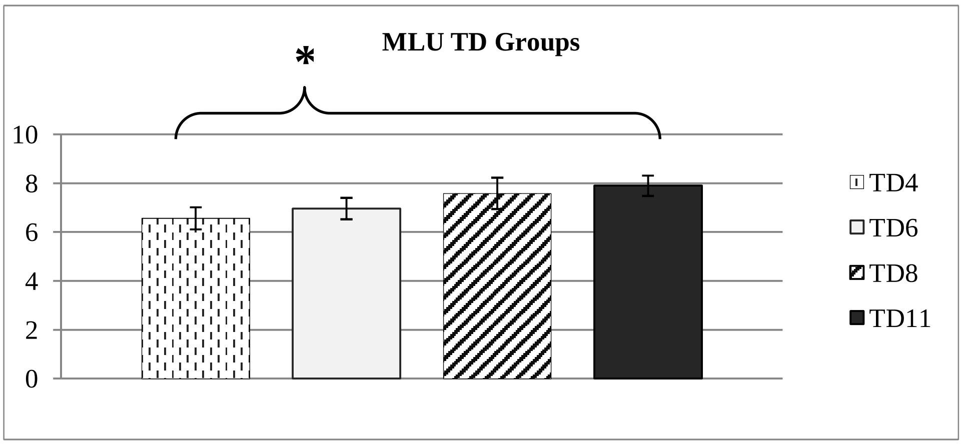
From T1 to T2, neither the L2 nor the SLI differed significantly with respect to MLU (L2: Z = 0.471, p = 0.64; SLI: Z = 0.00, p = 1.0). At T2, the L2 had MLUs which were significantly higher than the SLI (U = 109, p = 0.009) and the SLI were significantly lower than the TD8+11 (U = 70, $p < 0.001$). There were no significant differences between the TD4 and the SLI or between the TD4 and the L2 at T2 (SLI & TD4: U = 92, p = 0.16; L2 & TD4: U = 101, p = 0.085). The L2 group did not differ from the T8+11 at T2, but a slight tendency towards significance was observed (U = 186, p = 0.086). Therefore, at T2, the SLI had MLUs which were more clearly distinct from the L2 and the TD8+11; whereas, the L2 had MLUs that did not different significantly from the TD8+11.

Figure 7-7. MLU at T2 in the L2 and SLI Groups.



Concerning the difference in MLU between the two TD groups, the TD8+11 had MLUs that were significantly higher than the TD4 (U = 65, p = 0.0018). If we compare MLUs across the different TD age groups (TD4, TD6, TD8, and TD11), a gradual increase is observed (see Figure 7-8); however, the only significant difference is between the TD4 and TD11 (U = 19, $p < 0.001$)[77] which suggests that MLU, despite being quite variable, generally increases with age in the TD groups. Therefore, the observed lack of increase over a 12-month interval in the L2 and SLI groups appears to be characteristic of typical development in these age ranges.

Figure 7-8. MLU across the TD Age Groups.



[77] If we compare MLUs among the TD groups only (6 comparisons), the alpha level becomes $p < 0.0083$ after application of the Bonferroni correction (0.05/6). There is also a difference between the TD6 and TD11 ($p < 0.05$), but this would not be considered significant in this multiple comparison configuration. However, the tendency for MLU to increase between the TD6 and TD11 should be noted.

7.3.1.2 MLU individual results

Despite considerable variation, an analysis of MLU on an individual level suggests that a greater number of L2 children patterned with the TD8+11[78] compared to the children with SLI. Figure 7-9 shows that at T1, 18 out of 22 (82%) L2ers are within 2 *SD*s of the TD8+11 mean and 21/22 (96%) are at T2; whereas, a smaller proportion of children with SLI have MLUs that are within 2 standard deviations of the TD8+11 mean (12/19 or 63% at both T1 and T2). However, these proportions are not significantly different (T1: $\chi^2 = 0.08$, $p = 0.77$; T2: $\chi^2 = 0.39$, $p = 0.53$).

Figure 7-9 also allows us to observe that a numerically higher proportion of L2 children fall within 1 standard deviation of the TD4 distribution[79] at T1, however, these proportions are not significantly different either (L2: 18/22, SLI: 12/19; $\chi^2 = 0.08$, $p = 0.77$). As can be seen in Figure 7-10, at T2, almost all L2ers are within the TD4 distribution (21/22), although, again, the proportion in the SLI group (11/19) is not significantly different.

Figure 7-9. Percent of SLI & L2 Children who patterned with the TDs for MLU at T1.

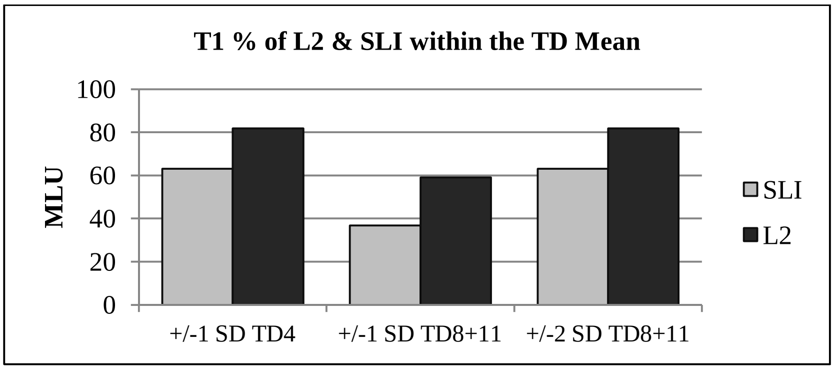
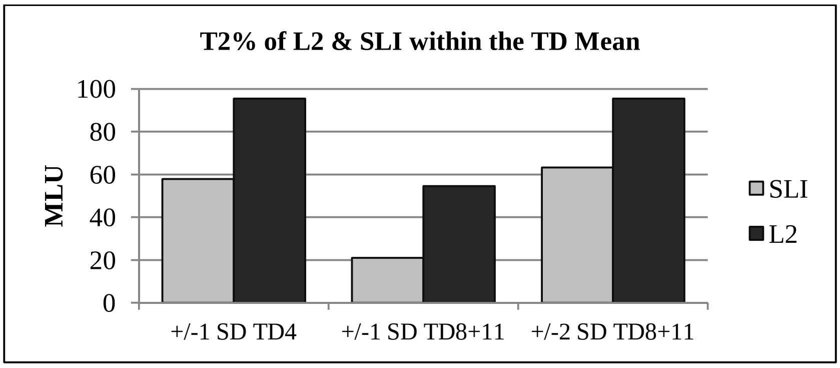


Figure 7-10. Percent of SLI & L2 Children who patterned with the TDs for MLU at T2.



[78] The mean MLU for the TD8+11 group is 7.75, with an SD of 1.07. This means that -1 *SD* refers to an MLU of 6.68. At -2 *SD*, the MLU is 5.60. One TD11 child has a MLU that is -1 *SD* below the TD8+11 mean (6.41). Two TD8 children have MLUs at or below -2 *SD* (5.59 and 5.25).

[79] The mean MLU for the TD4 group is 6.57 with an SD of 0.90. This means that -1 SD refers to an MLU of 5.7. One TD4 child has an MLUs at or below -1 *SD* (5.58).

Although the results from the Chi^2 tests do not reveal significant differences in the proportion of L2ers and children with SLI that fall within the TD distributions, one can nevertheless observe that the L2 group consistently has a higher proportion of children who pattern with the TD groups. For example, only one half to about two-thirds of the children with SLI has MLUs within one standard deviation of the TD4 from T1 to T2; whereas the proportion in the L2 children is above 80%. A similar pattern also obtains when examining the number of children in each group who fall within 2 standard deviations of the age-matched distribution.

Furthermore, the number of children with SLI who fall within the TD distributions does not increase at all over the 12-month period. The number of children with SLI with MLUs at or below -2 *SD* of the TD8+11 mean (5.60) remains at 7 from T1 to T2. Out of these 7 children at T1, four are in the younger SLI subgroup (< 9;4: KIB, ROA, SEL, THB). The remaining three children are in the older group (> 9;4: ANE, CLF, BRR). Almost all of the same 7 children (KIB, ROA, SEL, MAB, THB, DYR, CLF) fall outside of the TD mean again at T2.

Interestingly, all of the L2 children who have a MLU at or below 5.60 at T1 (< -2 *SD* of the TD8+11 mean) improve from T1 to T2. Three of these four L2 children (HAS, LOC and LOS) had less than 1.5 years of exposure at T1, which could potentially explain the low MLU. Note, however, that this is not the case for the other three children with a LoE of less than 1.5. The fourth child, LIB, was not particularly talkative at T1.[80] The lone L2er whose MLU is below -2 *SD* of the TD8+11 mean at T2 is SAJ, who was highlighted in the section on standardized tests (Section 7.2) due to her extremely low scores on most tasks.

7.3.1.3 MLU and age groups

At the beginning of this section, the question was posed as to whether older L2 children and children with SLI were comparable with respect to MLU. Table 7-8 shows the means and standard deviations for the MLU of each age group. These differences are significant only at T2 and only between the younger SLI and L2 groups ($U = 13$, $p < 0.01$). The L2 tend to have numerically higher MLUs than the SLI, which is unsurprising given the group results in the previous section. However, given that the only significant difference was between the younger subgroups, it appears that the older subgroups have comparable MLUs.

[80] The question of shyness as a methodological concern with spontaneous language samples will be addressed in the discussion (see Section 8.4).

Table 7-8. MLU by Age Group at T1 and T2.

MLU							
		SLI 6-9	**L2 6-9**	***p***	**SLI 9-12**	**L2 9-12**	***p***
T1	**M**	5.88	6.91	**	6.14	6.93	ns
	SD	*1.5*	*1.3*		*1.0*	*1.3*	
T2	**M**	5.66	6.96	ns	6.38	7.28	ns
	SD	*1.2*	*0.9*		*1.2*	*1.4*	

7.3.2 Clausal Embedding Measures

This section discusses the frequency of clausal embedding in the L2, SLI, TD4 and TD8+11 groups. Section 7.3.2.1 looks at group performance for these measures and Section 7.3.2.2 focuses on individual results. Section 7.3.2.3 compares the results for clausal embedding measures by age group. As was done for MLU, individual rates of clausal embedding will be compared to 1 *SD* of the TD4 mean and to both 1 *SD* and 2 *SD* of the TD8+11 mean.

7.3.2.1 Clausal embedding group results

The group means for each clausal embedding measure at T1 and T2 are presented Figures 7-11 and 7-12, respectively. As can be seen in these graphs, the L2 have numerically higher means than the SLI for all four basic measures of clausal embedding: subordination, complex utterances, clausal density, and deep embedding.[81] The results of a Kruskal-Wallis revealed significant group effects at T1 for the following two measures: clausal density: (H (3, 79) = 8.75 $p < 0.05$) and rate of complex utterances (H (3, 79) = 11.5, $p < 0.01$). However, post hoc pairwise comparisons revealed that the only significant difference between the SLI and the L2 at T1 concerns the rate of complex utterances (U = 127.5, p = 0.033). Other pairwise differences were also observed, but these would be considered significant only if a less conservative alpha ($p < 0.05$) is used (without the Bonferroni correction). If we consider the alpha level to be $p < 0.05$ (and not $p < 0.002$) for all comparisons, the TD8+11 had significantly higher performance than the SLI for the rate of complex utterances at T1 (U = 122.5, p = 0.0098), in addition to a tendency towards significance for clausal density (U =122.5, p = 0.053). The SLI and the TD4 did not differ significantly on any of the four clausal embedding measures at T1. The L2 did not differ from the TD8+11 for any clausal

[81] Recall from Chapter 6 that these measures are calculated as follows: subordination (number of subordinate clauses / number of verbal utterances), complex utterances (number of utterances with at least one subordinate clause / number of verbal utterances), clausal density (total number of clauses / number of verbal utterances), and deep embedding (number of clauses embedded at level-2 or higher / number of subordinate clauses).

embedding measure at T1. However, the L2 differ from the TD4 for the rate of complex utterances (U = 89, p = 0.035), as well as for clausal density (U = 92, p = 0.04).

Figure 7-11. Mean Clausal Embedding Measures at T1 in the SLI, L2, TD4, and TD8+11.

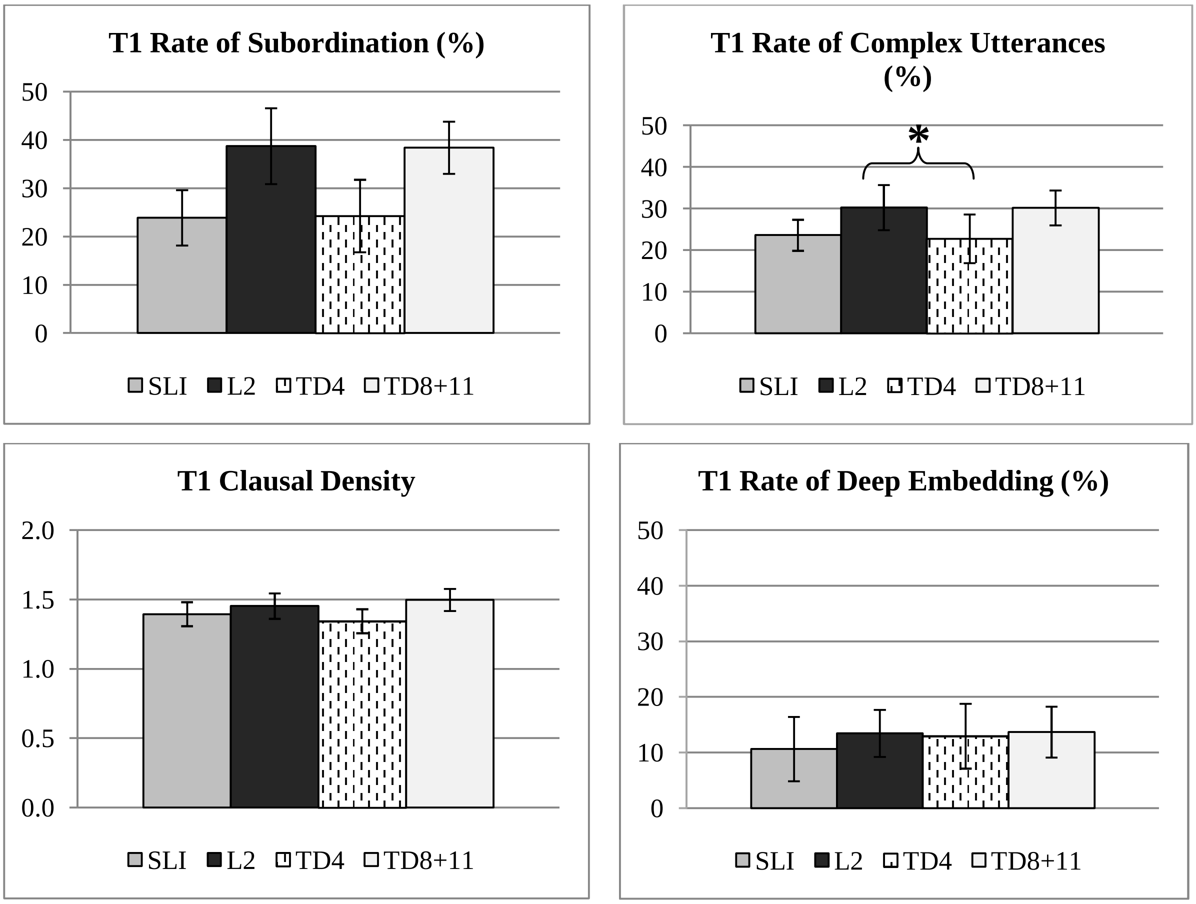
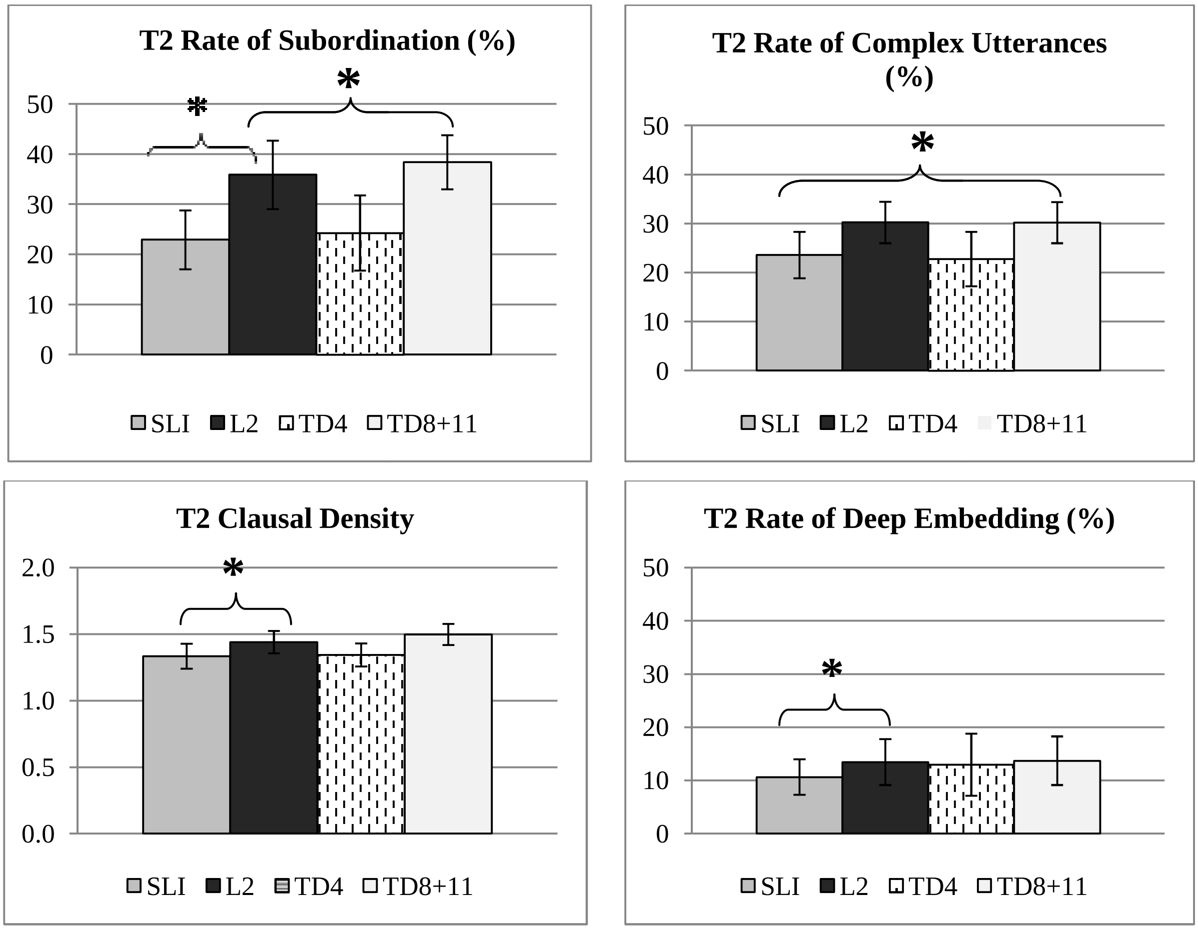


Figure 7-12. Mean Clausal Embedding Measures at T2 in the SLI & L2.



With respect to longitudinal development, the results in Figures 7-11 and 7-12 also show that neither the L2 nor the SLI increased their frequency of clausal embedding over the 12-month interval. Comparing Figures 7-11 and 7-12, one can see that the SLI decreased their use of clausal embedding at T2 compared to T1. This decrease was significant only for the rate of subordination (Z = 2.0, p < 0.05), but tendencies were found for clausal density (Z = 1.8, p = 0.076) and deep embedding (Z = 1.8, p = 0.074). The frequency of clausal embedding in the L2 group did not change from T1 to T2.

Concerning between-group comparisons at T2, a significant group effect was found for the following measures: rate of subordination (H (3, 79) = 15.6, p = 0.001), rate of complex utterances (H (3, 79) = 13.5 p = 0.003), clausal density (H (3, 79) = 12.7, p = 0.005), rate of deep embedding (H (3, 78) = 14.6, p = 0.002). The decrease in the frequency of clausal embedding in the SLI population and the relative stability of the same measures in the L2 group resulted in significant differences between the L2 and the SLI at T2 concerning the rate of subordination (U = 104, p = 0.006), clausal density (U =129.5, p = 0.037), and the rate of deep embedding ($U = 66$, $p = 0.00027$). In other words, at T1, but especially at T2, the L2 and the SLI pattern differently in terms of frequency of clausal embedding.

In terms of the comparison with the control groups, several differences were observed between the SLI and the TD8+11 at T2: The difference in the rate of subordination in the SLI versus the TD8+11 group ($U = 78.5$, $p < 0.002$) and the rate of complex utterances reached significance ($U = 101$, $p < 0.002$) with or without the Bonferroni correction. The difference in clausal density ($U = 109$, $p = 0.0036$), and rate of deep embedding ($U = 100$, $p = 0.0032$) are significant only if a less conservative alpha is considered. Regardless of the alpha adopted, the SLI clearly use clausal embedding less frequently than the L2 and the TD8+11 at T2. On the other hand, there were no significant differences between the L2 and the TD4[82] or the L2 and the TD8+11 at T2. The group results presented in this section indicate that the L2 use clausal embedding more frequently than the SLI. Furthermore, the L2 patterned closely with the TD8+11, as evidenced by the lack of significant differences between the two groups. The SLI, however, seem to show a pattern in which they differ from the age controls and perform closer to the TD4.

7.3.2.2 Clausal embedding measures individual results

Because the standard deviations of the clausal embedding measures in the SLI and L2 groups are generally high, reflecting the widely-documented heterogeneity in these learner groups, it is important to analyze results on a more individual level. Like what was observed for MLU, the individual results of the clausal embedding measures (rate of subordination, rate of complex utterances, clausal density, and rate of deep embedding) show that, compared to the SLI, a numerically larger proportion of L2 children performed within 1 or 2 *SDs* of the control group distributions. One can observe in Figures 7-13 and 7-14 that at least 77% (17/22) of the L2 group performed within 1 *SD* of the TD8+11[83] for all four measures; whereas the same proportion in the SLI group hovers between 47% (9/19) and 63% (12/19), depending on the particular measure. It can also be noted that, with the exception of deep embedding, the majority of the L2 and SLI perform within 1 *SD* of the TD4[84] and 2 *SDs* of the TD8+11.[85]

---

[82] As was seen at T1, the L2 tended to produce clausal embedding more frequently than the TD4, but differences were only significant without the Bonferroni adjustment (rate of complex utterances: $U = 89$, $p = 0.034$). The difference in the rate of clausal density tended towards significance: $U = 95.5$, $p = 0.057$).

[83] The number of TD8+11 children to have embedding rates at below -1 SD of the TD8+11 mean are as follows: for rate of subordination: 6/24; for rate of complex utterances: 4/24; for clausal density: 5/24; for deep embedding: 5/24.

[84] The number of TD4 children to have embedding rates at below -1 SD of the TD4 mean are as follows: for rate of subordination: 2/14; for rate of complex utterances: 1/14; for clausal density: 1/14; for deep embedding: 4/14.

Although a numerically higher proportion of L2 children performed within 1 *SD* or higher of age controls at T1, Chi^2 tests revealed that these differences are not significant.[86]

Figure 7-13. L2 Children with Clausal Embedding Measures within the TD Mean at T1.

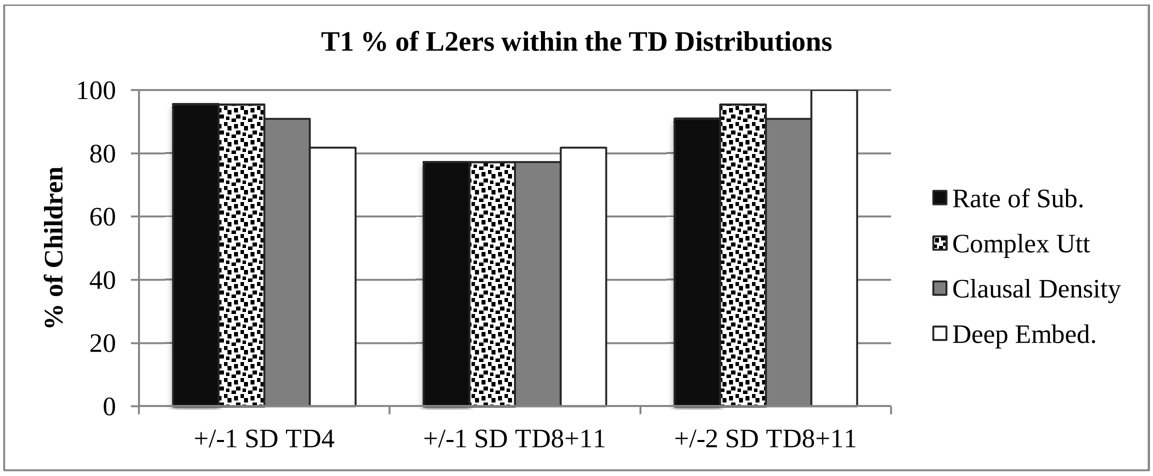
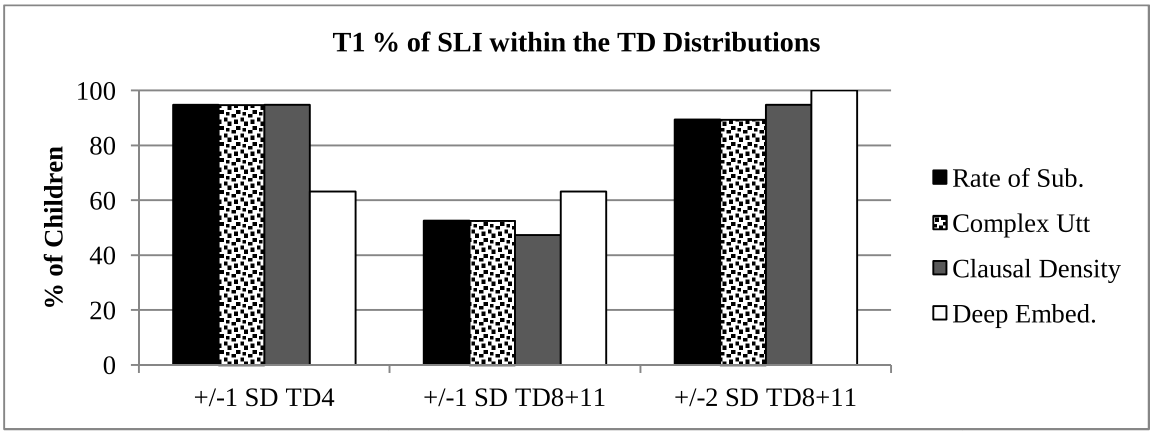


Figure 7-14. SLI Children with Clausal Embedding Measures within the TD Mean at T1.



What can be said about the individual children who fall outside of -1 *SD* of the TD4 mean and -2 *SD* of the TD8+11 mean? In the L2 group, the children who perform below -2 *SD* of the TD8+11 mean for rate of subordination and clausal density at T1 included LOS and LOC, who had relatively little exposure at T1 (0;11 and 1;5 respectively) and whose MLUs were also reported as being low (see Section 7.3.1). LOS was the lone L2 child who performed below the TD8+11 cutoff for the rate of complex utterances (7.5%) at T1. It is important to

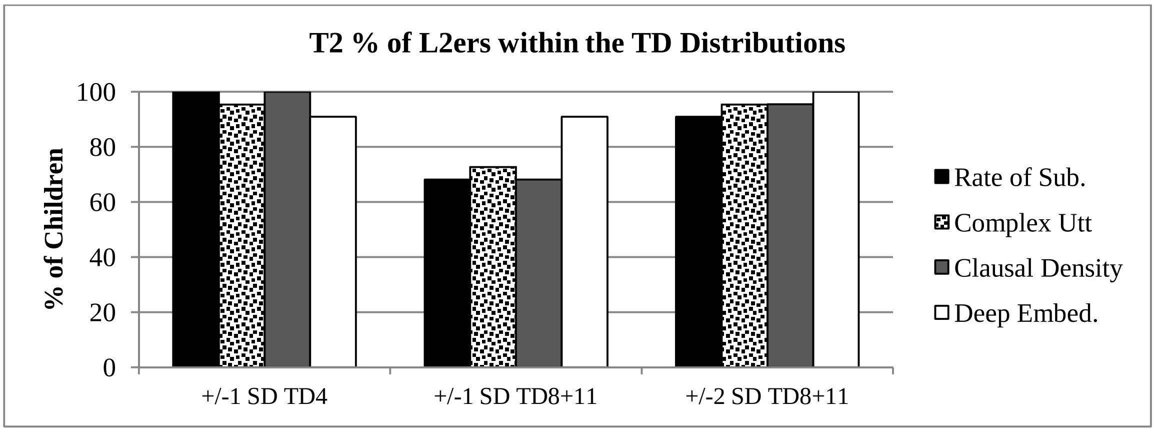
[85] The number of TD8+11 children to have embedding rates at below -2 SD of the TD8+11 mean are as follows: for rate of subordination: 0/24; for rate of complex utterances: 0/24; for clausal density: 0/24; for deep embedding: 0/24.

[86] (T1 Rate of Subordination: L2: 17/22; SLI: 10/19, $\chi^2 = 0.26$, $p = 0.61$; T1 Complex Utterances: L2: 17/22 ; SLI: 10/19, $\chi^2 = 0.26$, $p = 0.61$; T1 Clausal Density: L2: 17/22; SLI: 9/19, $\chi^2 = 0.48$, $p = 0.49$; T1 Deep Embedding: L2: 18/22 ; SLI: 12/19, $\chi^2 = 0.08$, $p = 0.77$).

note that LOS was aged only 7;4 at T1, so she was younger than the mean age of the TD8+11 (9;10). However, if her z-score is calculated with the TD6 distribution, her rate of complex utterances falls below -2 *SD* as well. Although limited LoE may explain the low rate of embedding used by LOS and LOC, it is important to note that there were three other children with a LoE of 0;11 who patterned with the rest of the L2 group (EMH, HAS and MAS). Four L2 children (PUS, LOC, HAS and MER) produced no utterances with subordinate clauses embedded at level 2 or higher.[87] The children with SLI who performed below the TD8+11 cutoff at T1 were THB (9;1) and BRR (11;5). Furthermore, there were seven children with SLI who did not produce any deeply embedded subordinate clauses at T1.

Given the group differences at T2 reported in the previous section, it is perhaps unsurprising to observe that the differences in individual results between the SLI and L2 are starker at T2, as can be seen in Figures 7-15 to 7-16. Whereas the L2 group's performance remained somewhat stable from T1 to T2, more children with SLI performed at or below -1 *SD* of the TD8+11 distributions at T2. These proportions, however, did not differ significantly between groups, as was the case at T1.[88]

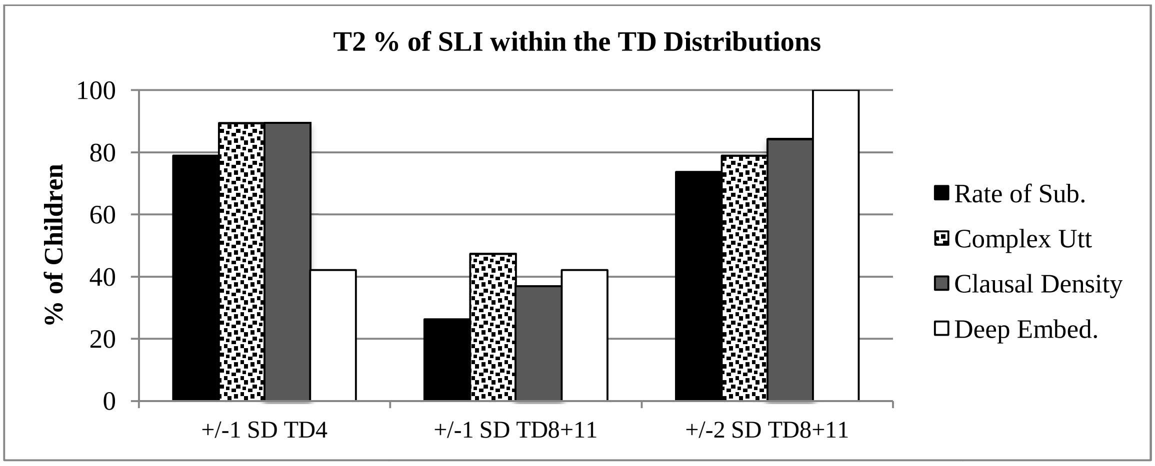
Figure 7-15. % of L2 Children with Clausal Embedding Measures within the TD Mean at T2.



[87] Recall that the rate of deep embedding is the number of clauses embedded at level-2 or higher divided by the number of subordinate clauses. This means the rate of deep embedding measure can sometimes be inflated if the total number of subordinate clauses is very low. For example, at T1 LOS produced a total of only 4 subordinate clauses, one of which was embedded at level 2, which gives her a rate of deep embedding of 25%.

[88] T2 Rate of Subordination: L2: 15/22 ; SLI: 5/19, $\chi^2 = 1.8$, $p = 0.19$; T2 Complex Utterances: L2: 16/22; SLI: 9/19 $\chi^2 = 0.32$, $p = 0.57$; T2 Clausal Density: L2: 15/22; SLI: 7/19, $\chi^2 = 0.72$, $p = 0.4$; T2 Deep Embedding: L2: 20/22; SLI: 8/19, $\chi^2 = 1.52$, $p = 0.22$.

Figure 7-16. % of SLI Children with Clausal Embedding Measures within the TD Mean at T2.



The L2 children who performed at or below -2 *SD* of the TD8+11 distribution for rate of subordination at T2 included ALP and SAJ. These two were very close to this cutoff for the other three measures, but only ALP reached it for clausal density and rate of complex utterances. Two other L2 children (IOC and HEA) produced no utterances with deep embedding at T2. Recall from previous sections (Section 7.2) that ALP and SAJ consistently obtained low standardized test scores.

The five children with SLI who were below the TD8+11 cutoff at T2 included four children from the SLI 6-9 group (ROA, SEL, THB, and JEM). The fifth child with SLI to score below this cutoff at T2 was COD (11;6). Interestingly, data for COD was collected by our lab two years prior to his participation in this longitudinal study. Looking back at the first spontaneous language sample, Damourette (2007) describes in detail the severity of this child's language impairment. Specifically, she analyzed his reliance on the use of protoforms. Although this child's language improved greatly with age and treatment, the avoidance of embedding seems to characterize his impairment in later childhood.

7.3.2.3 Clausal embedding and age groups

Tables 7-9 and 7-10 display the means and standard deviations for clausal embedding measures by age group and Figure 7-17 shows the individual results at T1 and at T2. What is immediately noticeable is the difference between the two 6-9 groups (6 to 9-year-olds with SLI and the L2 6- to 9-year-olds); whereas the two 9-12 groups have performances that are relatively close. Again, these differences are more obvious at T2. The younger L2 children use significantly more embedding (and more deeply embedded clauses) than the younger SLI as measured by the rate of complex utterances at T1 (U = 20.5, p < 0.05) and by all four measures at T2.[89] The only difference in the 9-12 age group comparisons that reached significance was the rate of deep embedding at T2.

Table 7-9. Mean Measures of Clausal Embedding by Age Group at T1.

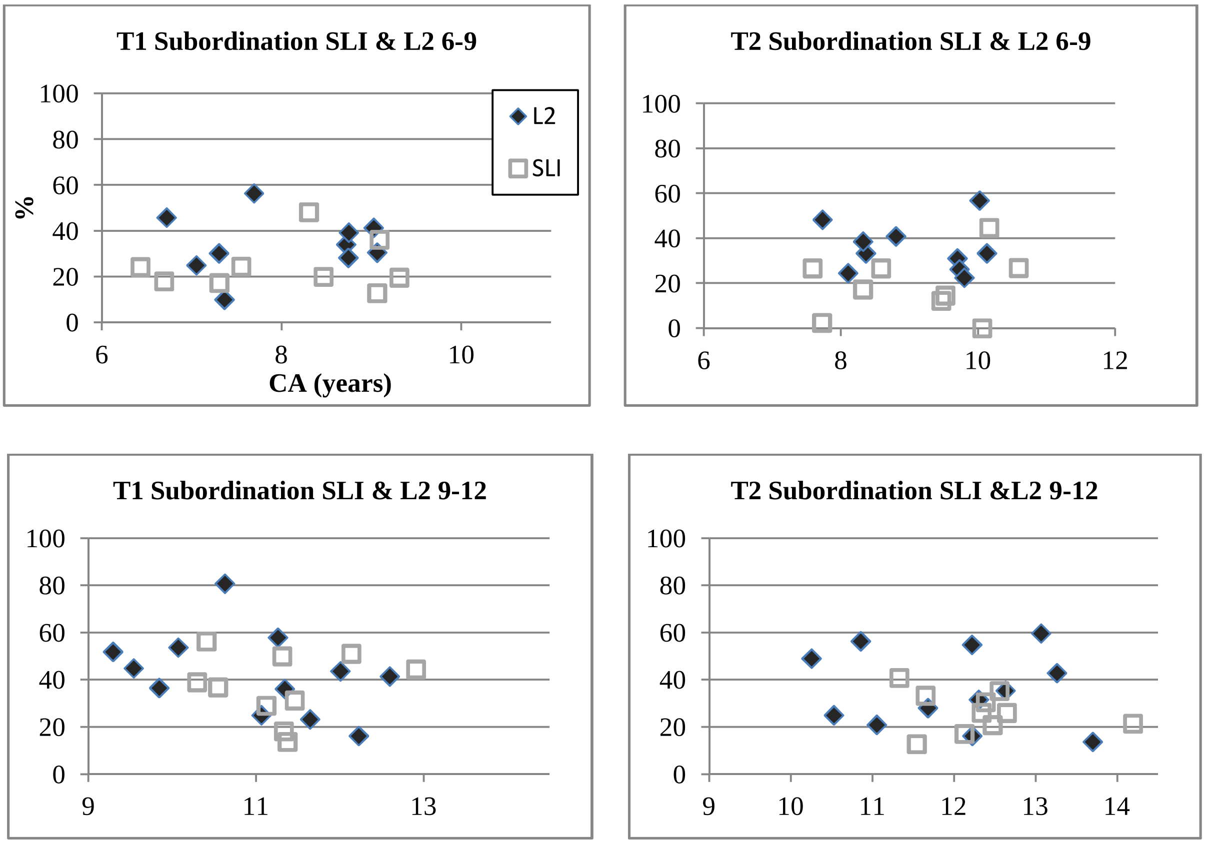
Measures of clausal embedding at T1								
		SLI 6-9	**L2 6-9**	***p***	**SLI 9-12**	**L2 9-12**	***p***
Rate of subordination	**M**	24.5	34.1	ns	37.0	42.6	ns
	SD	*11.0*	*12.6*		*14.1*	*17.5*	
	Range	13-48	10-56		14-56	16-81	
Rate of complex utterances	**M**	19.9	26.8	*	27.0	33.1	ns
	SD	*5.8*	*9.3*		*7.4*	*11.6*	
	Range	13-30	7.5-41		12-38	16-54	
Clausal density	**M**	1.32	1.41	ns	1.46	1.49	ns
	SD	*0.2*	*0.2*		*0.1*	*0.2*	
	Range	1.15-1.70	1.1-1.70		1.27-1.66	1.16-1.85	
Rate of deep embedding	**M**	8.7	14.7	ns	12.4	12.4	ns
	SD	*10.3*	*9.1*		*12.9*	*8.1*	
	Range	0-27.3	0-25		0-39	0-24	

Table 7-10. Mean Measures of Clausal Embedding by Age Group at T2.

Measures of clausal embedding at T2							
		SLI 6-9	**L2 6-9**	***p***	**SLI 9-12**	**L2 9-12**	***p***
Rate of subordination	**M**	19.0	35.6	*	26.4	36.1	ns
	SD	*13.9*	*10.9*		*8.7*	*16.1*	
	Range	0-45	23-57		13-41	14-60	
Rate of complex utterances	**M**	16.9	27.7	*	24.1	26.8	ns
	SD	*10.6*	*7.6*		*7.1*	*9.5*	
	Range	0-34	18-41		13-32	12-42	
Clausal density	**M**	1.27	1.44	*	1.39	1.44	ns
	SD	*0.18*	*0.11*		*0.19*	*0.21*	
	Range	1.1-1.68	1.3-1.65		1.17-1.76	1.18-1.78	
Rate of deep embedding	**M**	6.9	16.5	*	3.9	15.8	*
	SD	*7.9*	*7.9*		*5.5*	*9.5*	
	Range	0-18	0-27		0-15	0-36	

[89] (Rate of subordination: U =17, p < 0.05; Rate of complex utterances: U =17.5, p < 0.05; Clausal density: U =14, p < 0.05; Rate of deep embedding: U =16, p < 0.05)

Figure 7-17. Rate of Subordination by Age Group at T1 & T2.



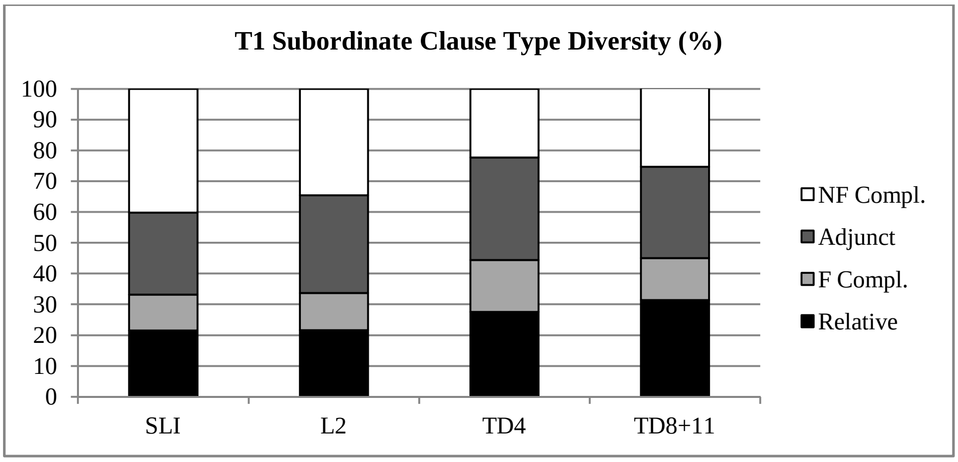
7.3.3 Subordinate clause types

The results discussed in the previous sections revealed that the L2 used clausal embedding more frequently than the SLI. Yet, one can wonder what type of subordinate clauses were the most frequently used in each group. Recall from Section 5.5.1 that non-finite complement and adjunct clauses are often considered less syntactically complex than finite complement and relative clauses.[90] The goal of this section is to analyze the relative frequency of these subordinate clause types in the data as well as their proportion out of the total number of subordinate clauses produced. This was done though the analysis of diversity of subordination (total number of a particular subordinate clause type / the total number of subordinate clauses).

[90] Some clause types were lumped into the same group because they were rare in the data. These included, for example, causative clauses, which were included in the non-finite complement clause group. This inflates the number of CNs. The total raw number of causatives was as follows: T1: L2:5; T2: L2:10; T1: SLI:6; T2: SLI:5.

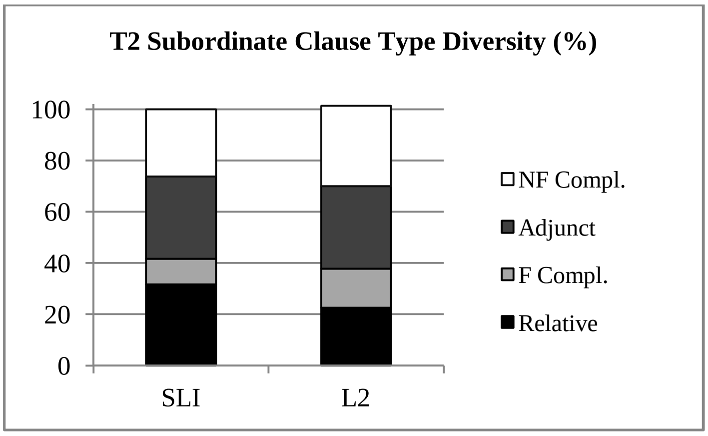
Figure 7-18 shows the mean proportion of each clause type out of the total number of subordinate clauses produced per group at T1. One interesting observation here is that the SLI and the L2 both used a relatively high number of non-finite complement clauses and adjunct clauses and relatively fewer relative clauses compared to both control groups. The only significant group effect found concerned the proportion of non-finite complement clauses (H (3, 79) = 19.1, $p < 0.001$) and only at T1. However, the only pairwise difference that reaches significance with the Bonferroni adjustment is between the SLI and TD8+11 ($U = 77.5$, $p < 0.002$). If, however, p is set at 0.05, the difference between the L2 and the TD8+11 and the L2 and the TD4 is also significant ($U = 64.5$, $p = 0.0036$).

Figure 7-18. Proportion of Subordinate Clause Types at T1 in the SLI, L2, TD4 and TD8+11.



The results at T2 are presented in Figure 7-19. Within-group analyses of the progression from T1 to T2 in the SLI and L2 revealed that the SLI used a significantly weaker proportion of non-finite complement clauses at T2 compared to T1. At T2, the SLI had a significantly higher proportion of relative clauses compared to T1 ($Z = 2.3$, $p < 0.05$). Longitudinal differences in the L2 group did not reach significance.

Figure 7-19. Proportion of Subordinate Clause Types at T2 in the SLI and L2.



The subordinate clause diversity expressed as proportions allow us to see which clause types were most frequent; however, these proportions are calculated out of the total number of subordinate clauses, a figure which varies across groups. Because the length of the language samples is the same across groups and testing intervals, an analysis of raw occurrences of subordinate clauses is possible and relevant. Figures 7-20 and 7-21 reveal the mean raw occurrences of each of the four subordinate clause types analyzed here. A significant group effect was observed at T1 (H (3, 79) = 15.5, p = 0.001) and at T2 (H (3,79) = 27.6, p = 0.0001). A glance at Figure 7-20 shows that the L2 and the TD8+11 produced a numerically higher mean number of subordinate clauses compared to the SLI and the TD4. The difference between the SLI and the L2 is significant at T2 only (see Figure 7-21) (U = 3.45, p < 0.001). The difference between the TD8+11 and the L2 did not reach significance at T1 (U = 183, p = 0.07) or T2 (U = 194.5, p = 0.13), but the SLI and the TD8+11 difference was highly significant at both T1 (U = 90, p < 0.001) and T2 (U = 32.5, p < 0.0001). No significant differences were found when comparing the TD4 to the L2 on the one hand and to the SLI on the other.

Figure 7-20. Mean Raw No. of Subordinate Clauses at T1 in the SLI, L2, TD4, and TD8+11.

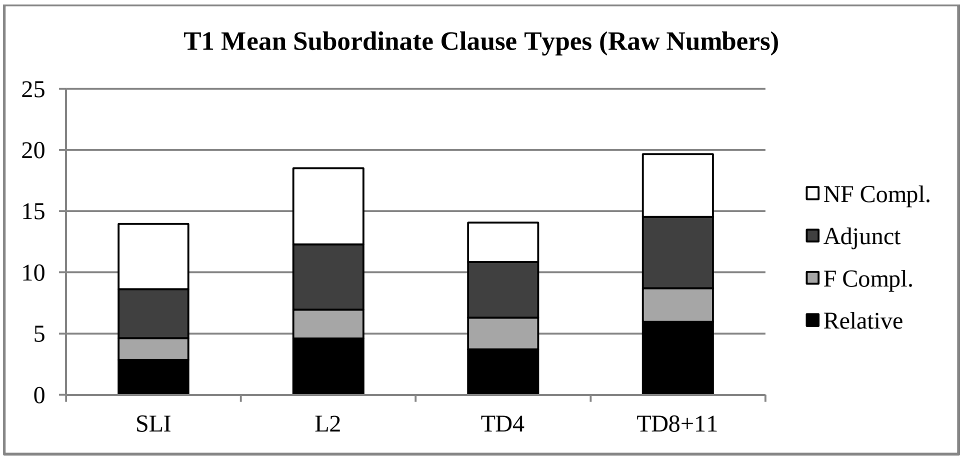
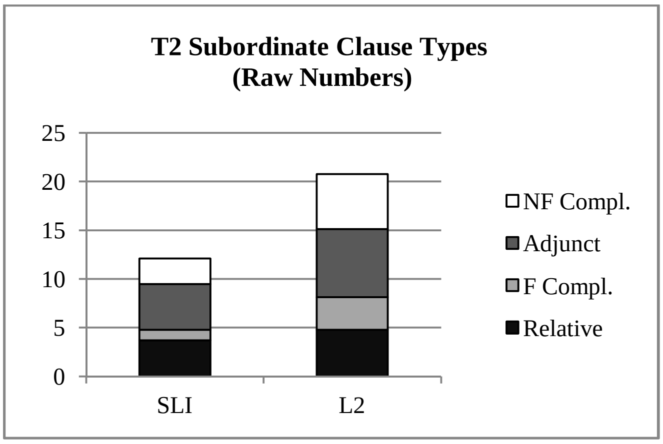


Figure 7-21. Mean Raw Number of Subordinate Clauses at T2 in the SLI and L2.



Relative clauses having received abundant attention in the psycholinguistic literature, special attention will be paid to the frequency of this clause type. More specifically, subject relatives have been shown to be acquired earlier and used much more accurately in elicited production than object relatives in TD children (De Cat 2002; Friedmann et al. 2009). However, subject relatives remain a source of difficulty for children with SLI (Hamann et al. 2007). Because all types of relative clauses appear to create obstacles for children with SLI, subject and non-subject relatives will be analyzed together. Results discussed above concerning the proportion of relative clauses out of all subordinate clauses suggested that the SLI produced relative clauses quite frequently. However, when we look at raw numbers, we see that the mean number of relatives produced by the SLI is not numerically higher than any of the other groups at T1 or T2. Although the proportion of relative clauses increased significantly from T1 to T2 in the SLI, the same analysis on raw numbers was not significant (Z = 0.23, p = 0.82). Whether raw numbers or proportions are considered, the L2 showed no significant changes from T1 to T2 concerning subordinate clause type.

With respect to the between-group analyses of the raw number of relative clauses produced, a significant group effect was observed at both T1 (H (3, 79) = 13.6, p = 0.003) and T2 (H (3, 79) = 11.7, p = 0.008). Post hoc pairwise comparisons revealed that the SLI and the L2 did not differ significantly in the raw number of relatives produced at T1 (U = 156, p = 0.16) or at T2 (U = p = 0.24). However, when the L2 and SLI are compared to the TD8+11, the L2 are found to pattern with the TD8+11, whereas the SLI do not. The TD8+11 produced significantly more relative clauses than the SLI at both T1 and T2, even with the Bonferroni correction (T1: U = 77.5, p < 0.001; T2: U = 93, p < 0.001). The difference between the L2 and the TD8+11 tended towards, but did not reach significance at either T1 or T2 (T1: U = 182, p = 0.069; T2: U = 182.5, p < 0.07). In other words, both the SLI and the L2 produced fewer relatives than the TD8+11, but only the SLI differed significantly from the TD8+11.

Individual analyses were conducted by examining the raw number of relative clauses produced per child. Figure 7-22 shows the number of children on the Y axis and the number of relative clauses produced on the X axis. Despite variability in the frequency of relative clauses, especially in the L2 group, these graphs allow us to see that at T1 five L2ers (HAS, LIB, LOS, PUS and SAJ) and five children with SLI (ANE, BRR, ELG, KIB, ROA) produced fewer than two relative clauses at T1. When compared to the TDs (Figure 7-23), we see that only 2 TD4 children produced fewer than 2 relatives, while none of the TD8+11 produced fewer than 2 relatives. At T2, 6 L2 children (ALC, ALJ, ALP, RHR, SAJ and WRS) and 4 children with SLI (KIB, ROA, SEL, and THB) produced fewer than two relative clauses, as can be seen in Figure 7.24.

Figure 7-22. Number of Children per Number of Relatives Produced in the L2 and SLI at T1.

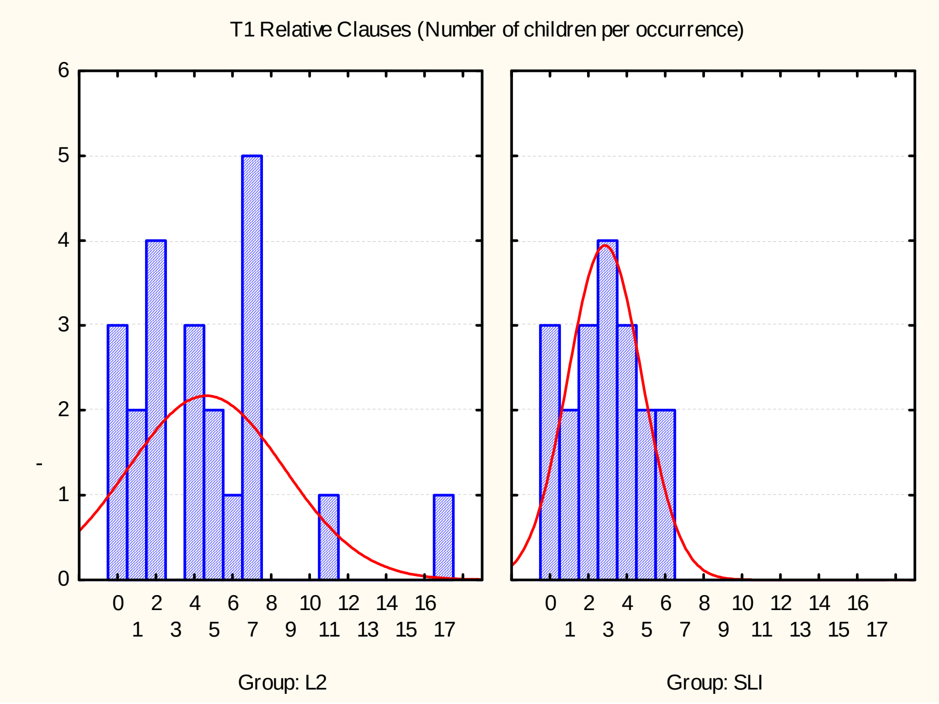


Figure 7-23. No. of Children Per No. of Relatives Produced by the TD4 & TD8+11 at T1.

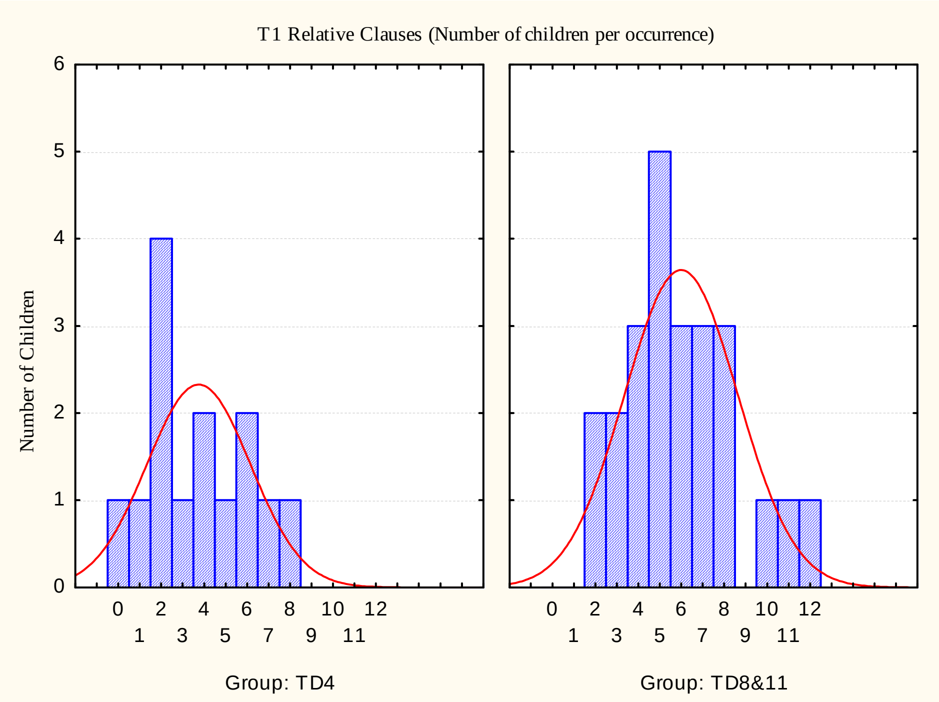
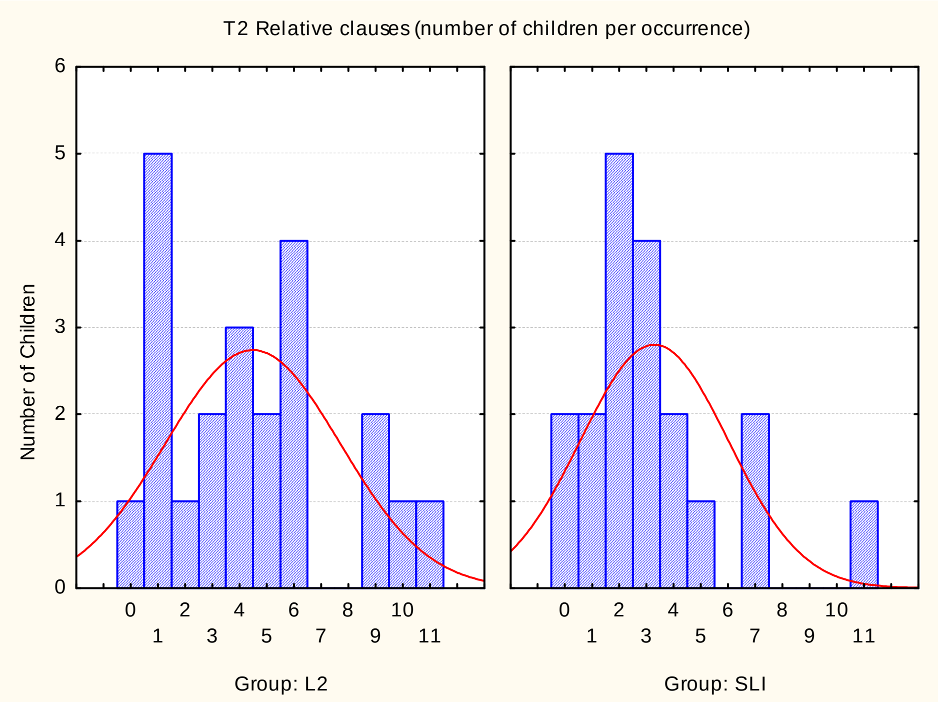


Figure 7-24. No. of Children Per No. of Relatives Produced by the L2 & SLI at T2.



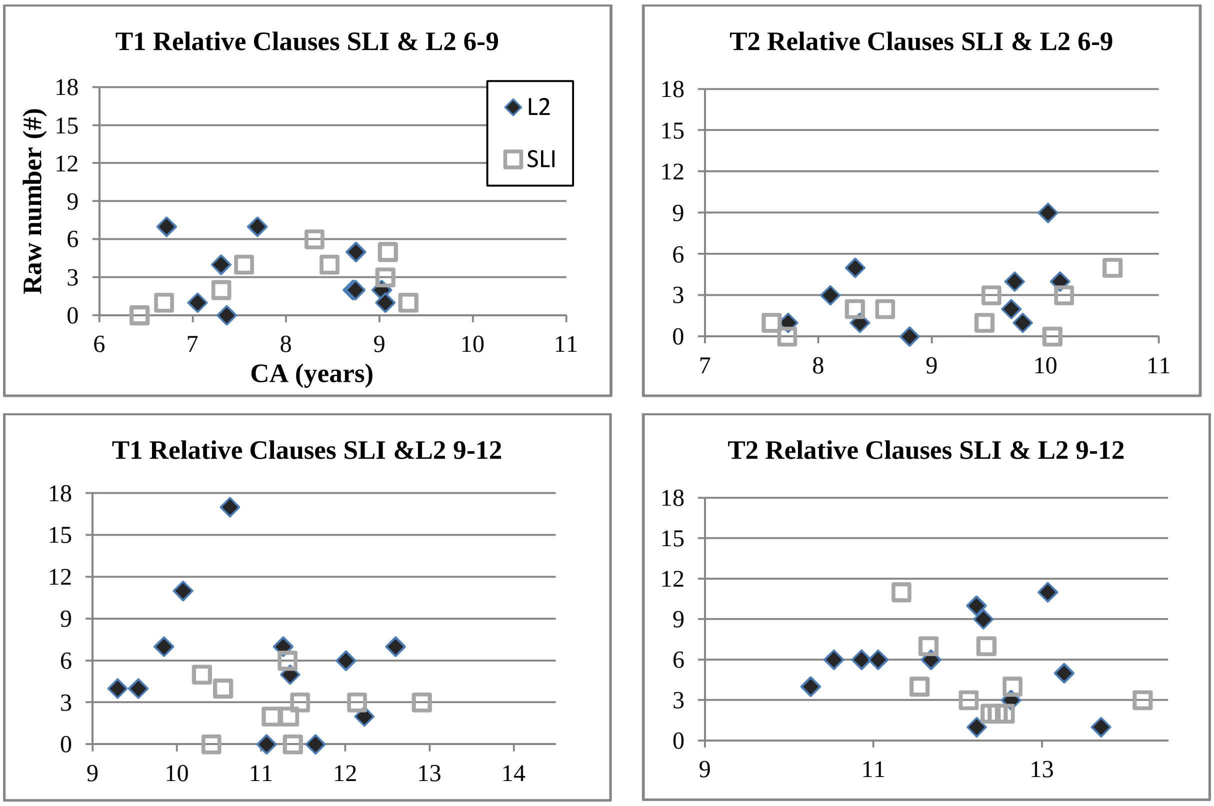
How did the age groups perform with respect to relative clauses? Table 7-11 shows that children in the L2 9-12 group produced a higher mean raw number (T1: *M* = 6; *SD* = 4.7; T2: *M* = 6; *SD* = 3.2) of relative clauses compared to the older SLI (T1: *M* = 3; *SD* = 1.9; T2: *M* = 5; *SD* = 3), but this difference only tended towards significance at T1 ($U = 39.5$, $p = 0.063$) and there was no statistically significant difference at T2 ($U = 47.5$, $p = 0.41$). The raw number of relative clauses produced is not correlated with age in either group at T1 (L2: $r_s = 0.17$, $p = 0.45$; SLI: $r_s = 0.035$, $p = 0.89$), but this correlation is marginally significant at T2 in the SLI and tends towards significance in the L2 at T2 (L2: $r_s = 0.4$, $p = 0.07$; SLI: $r_s = 0.46$, $p < 0.05$). Looking at individual results at T1 within each age group (Figure 7-25), one can see that 9 out of 12 (75%) older L2 children produced 4 or more relative clauses whereas only 3 out of 10 (30%) older children with SLI did so. At T2, although 3 out of 10 (30%) older children with SLI produced six or more relative clauses, there were 7 out of 12 older L2 children (58%) to do so.

.

Table 7-11. Mean Raw Number of Relatives by Age Group.

Relatives clauses (Raw number)								
		SLI 6-9	**L2 6-9**	***p***	**SLI 9-12**	**L2 9-12**	***p***
T1	**M**	2.9	3.1	ns	2.8	5.8	.063
	SD	*2.0*	*2.5*		*1.9*	*4.7*	
T2	**M**	1.9	3.0	ns	4.5	5.7	ns
	SD	*1.6*	*2.7*		*3.0*	*3.2*	

Figure 7-25. Number of Relative Clauses per Child per Age Group.



7.3.4 Interim Summary: MLU and Clausal Embedding Measures

The MLU results revealed that the L2 had significantly longer utterances than the SLI at both T1 and T2 and that neither group increased their MLU between T1 and T2. When analyzed according to age groups, younger L2 children had significantly longer MLUs than the younger children with SLI at T2. The older L2 children had numerically higher MLUs, but this was not significantly different from the older SLI. Individual variation for this measure was considerable.

The analysis of clausal embedding has revealed that the L2 produced subordinate clauses more frequently than the SLI. This was evidenced by significant group differences in clausal embedding measures at T1, but especially at T2. Furthermore, there were many significant differences between the SLI and TD8+11, even when defining significance with a more conservative alpha. The L2, on the other hand, did not differ significantly from the TD8+11 for almost all measures of clausal embedding, the one exception being the frequency of relative clauses and non-finite complement clauses. Furthermore, the L2ers did not increase their frequency of clausal embedding from T1 to T2. The results for clausal embedding across different TD age groups suggest that the frequency of embedding does not increase over the span of one year. Figure 7-26 shows a gradual increase in measures of clausal embedding in the TD4, TD6, TD8, and TD11. There are few significant differences found among the different TD age groups. The TD4 and the TD11 are the only groups that differ significantly for several measures.[91] The TD6 also differ significantly from the TD11 for clausal density ($U = 28.5$, $p < 0.05$).

Figure 7-26. Measures of Clausal Embedding Across Different TD Age Groups

Measures of clausal embedding in the TD groups					
		TD4	**TD6**	**TD8**	**TD11**
Rate of subordination	**M**	29.8	32.0	36.3	40.5
	SD	*17.6*	*11.4*	*11.6*	*10.0*
Rate of complex utterances	**M**	23.1	25.9	28.3	32.2
	SD	*11*	*8.5*	*9.1*	*7.4*
Clausal density	**M**	1.34	1.4	1.4	1.5
	SD	*0.17*	*0.14*	*0.17*	*0.13*
Rate of deep embedding	**M**	11.2	10.4	12.4	12.5
	SD	*10.2*	*7.4*	*6.8*	*9.9*

7.3.5 Morphosyntactic Properties

Previous comparative research has largely focused on non-target morphosyntactic forms in the language performance of children with SLI and L2 children under the age of 9. In the first part of this section, all errors in morphosyntax (see Section 6.3.3.3.2 for more details) will be considered. In the following sections, accuracy involving morphosyntactic properties such as

[91] TD11>TD4 for: the rate of subordination: U = 38, p < 0.05; clausal density: U = 32, p < 0.01; and the rate of complex utterances: U = 32, p < 0.01

verb morphology, object clitics, and grammatical gender, which have often been investigated in the literature, will be analyzed. These error types also represent the most frequently occurring types in the data. At T1, the sum of the total number of errors from the SLI and the L2 groups was 947 errors. Twenty-four per cent of these errors were errors in verb morphology (223/947), 14% (129/947) were related to object clitics, 13% (118/947) were gender errors. These three error types represented half of the error types found in the data. The closest error type to gender in terms of number of errors was errors related to prepositions at 10% (97/947). The rest of the error types represented less than 10% of the total number of errors produced. **The goal of each section will be to discuss where the SLI and L2 groups overlap or diverge with respect to verb morphology, object clitics, and grammatical gender agreement, how each group progressed from T1 to T2, and lastly, how the younger and older age groups compare to each other.**

In the previous sections concerning clausal embedding measures, two different control groups were used (TD4 and TD8+11) for comparative purposes. In the following sections on morphosyntactic properties, only the TD4 group will be used. The TD8+11 group is highly accurate with respect to morphosyntax (mean rate of erroneous utterances[92] = 1.37%, *SD* = 1.68), and therefore, beyond the fact that the age-matched TD children made significantly fewer errors than the SLI and the L2, there is very little else to say about this particular group comparison with respect to morphosyntactic accuracy.[93]

This section is organized as follows: Section 7.3.5.1.1 reports on overall morphosyntactic accuracy in the SLI, L2, and TD4 groups as measured by the rate of erroneous utterances. The performance of the SLI and L2 age groups will also be considered in Section 7.3.5.1.2. Next, in sections 7.3.5.2-7.3.5.4 the SLI, L2, and TD4 performance on verb morphology, object clitics, and grammatical gender will be analyzed. Following the analysis of morphosyntactic properties, Section 7.3.6 discusses error distribution in terms of the rate of erroneous complex and simple utterances, target relative clauses, and correlations between clausal embedding and error rates.

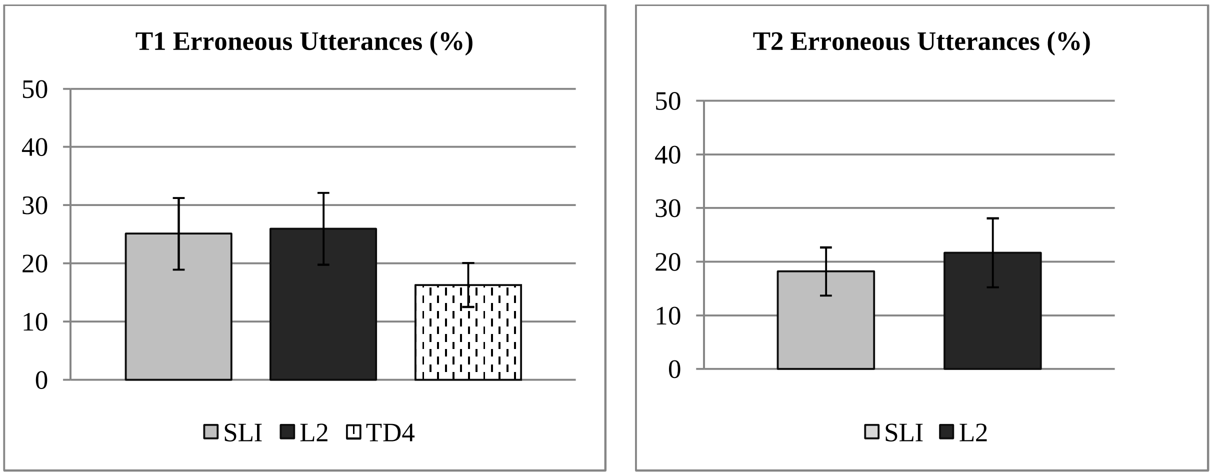
[92] Recall from Chapter 6 that the measure called the rate of erroneous utterances refers to the number of utterances with at least one morphosyntactic error divided by the total number of utterances.
[93] A group of 12 TD 6-year-old children could have also been included, but their rate of erroneous utterances was also extremely low (*M* = 3.05, *SD* = 2.11).

7.3.5.1 Overall morphosyntactic accuracy

7.3.5.1.1 Overall morphosyntactic accuracy group results

The mean rates of erroneous utterances per group at T1 and T2 are presented in Figure 7-27. One can observe that, on average, the TD4 are more accurate than the SLI and the L2. The results of a Kruskal-Wallis reveal a significant difference across these groups (H (2, 55) = 6.41, p = 0.04). Pair-wise comparisons reveal that the TD4 were more accurate compared to the L2 and the SLI; however, this is the case only if a less conservative alpha is considered (L2 & TD4: U = 81, p = 0.017; SLI & TD4: U = 76, p = 0.038). There are no significant differences across these groups for overall percentage of erroneous utterances at T2 (H (2, 55) = 1.97, p = 0.37).

Figure 7-27. Rate of Erroneous Utterances at T1 and T2 in the SLI, L2, and TD4.



Concerning longitudinal within-group results, both the SLI and L2 groups were more accurate at T2 compared to T1. This progression was significant in the SLI, and barely missed significance in the L2 population (SLI: Z =2.4, p < 0.05; L2: Z = 1.9, p = 0.058; SLI)

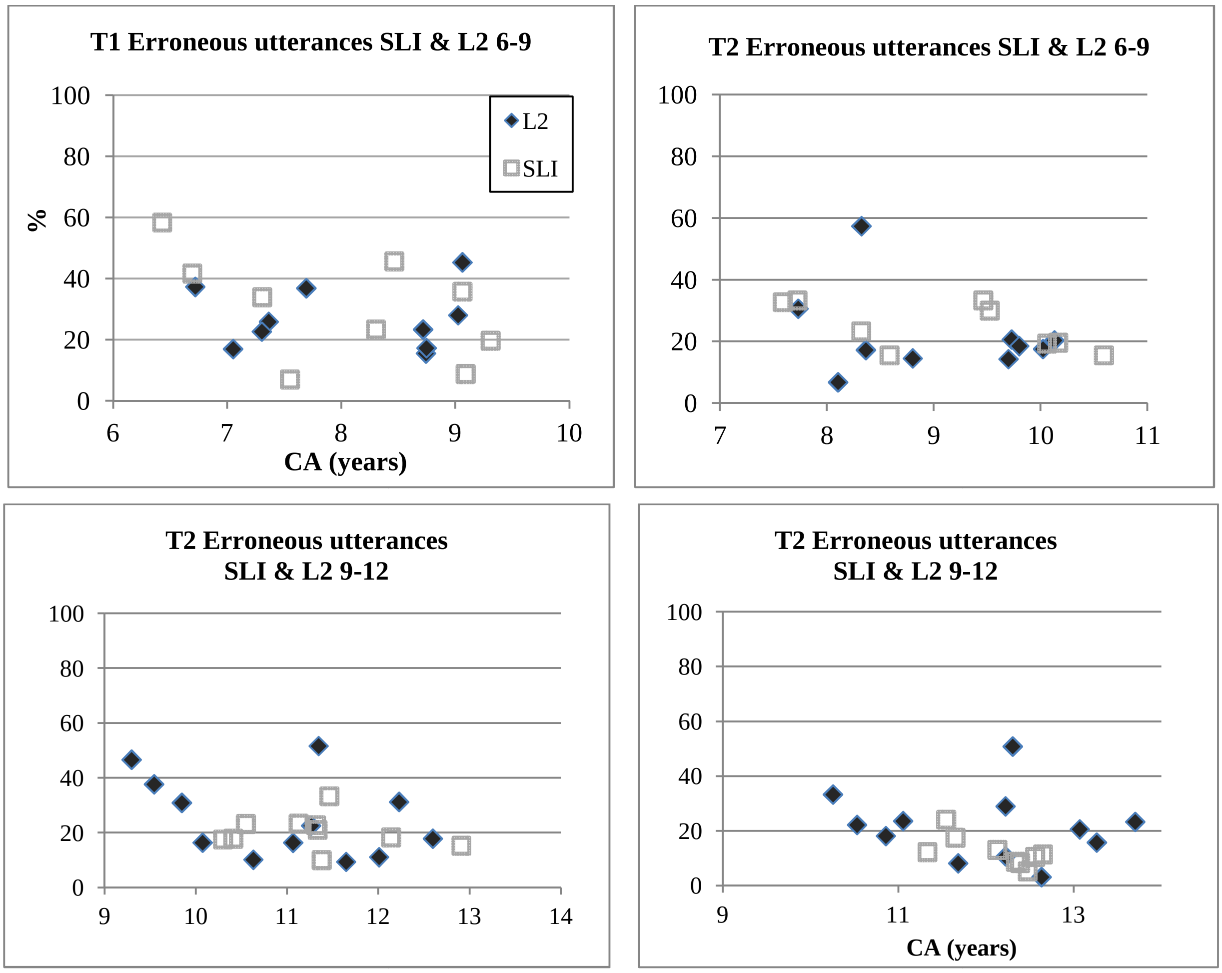
7.3.5.1.2 Overall morphosyntactic accuracy and age groups

When comparing the L2 and SLI groups by age, an interesting observation can be made about morphosyntactic accuracy in the 9-12 groups. Table 7-12 displays the group results and Figure 7-28 displays the individual results by age group. These graphs show that the older children with SLI tend to have a lower mean percentage of utterances with at least one error (i.e., tend to have higher morphosyntactic accuracy) than the older L2 children. This difference tends towards significance at T2 (U = 32, p = 0.065). Furthermore, a negative correlation exists between age and the rate of erroneous utterances in the SLI group at both T1 and T2, although this correlation just misses significance at T1 (T1: r_s = -0.45, p = 0.056; T2: r_s = -0.83, p < 0.0001). There is no significant correlation in the L2 population for these variables (T1: r_s = -0.22, p = 0.34; T2: r_s = -0.011, p = 0.96). Because errors do not necessarily decrease with age in the L2 population, 9-12 L2 group tended to have lower morphosyntactic accuracy than the 9-12 group with SLI.

Table 7-12. Rate of Erroneous Utterances by Age Group at T1 and T2.

		% Erroneous utterances					
		SLI 6-9	**L2 6-9**	***p***	**SLI 9-12**	**L2 9-12**	***p***
T1	M	30.45	26.90	ns	20.27	25.17	ns
	SD	*17.17*	*10.00*		*6.2*	*14.4*	
T2	M	24.75	21.79	ns	12.31	21.59	.065
	SD	*7.64*	*13.87*		*5.3*	*12.6*	

Figure 7-28. Individual Rates of Erroneous Utterances by Age Group at T1 and T2.

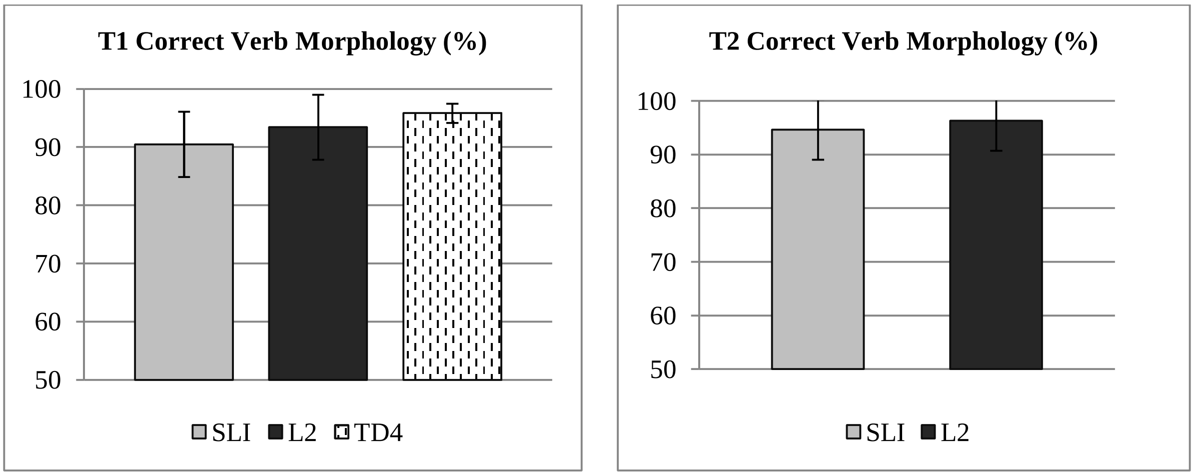


7.3.5.2 Verb morphology

Recall from chapters 2 and 3 that verb morphology (especially tense morphology) has garnered much attention in the literature on the direct comparison of L2 and SLI as well as on the study of each population individually. In French-speaking children with SLI or children acquiring French as an L2, there is no clear consensus on whether root infinitives are consistently characteristic of their grammars. Furthermore, little research has been done on how L2 children acquire tense choice in French. This section will therefore look at various aspects of verb morphology: all types of errors dealing with verb morphology (finiteness, tense choice, subject-verb agreement) will initially be analyzed together, and then finiteness and tense choice will be analyzed separately.

With respect to overall accuracy in verb morphology (i.e., the number of target verbs out of the number of obligatory verb contexts), there is no significant difference between the SLI, L2 and TD4 at T1 or T2 (T1: H (2, 55) = 3.2, p = .20; T2: H (2, 55) = 3.7, p =.16). Both the L2 and SLI improve significantly from T1 to T2 for verb morphology (SLI: Z = 2.45, $p < 0.05$; L2: Z = 2.26, $p < 0.05$). Looking at performance by age groups revealed no significant differences in overall verb morphology and there was no significant correlation with age in either group (L2 T1: $r_s = 0.17$, $p = 0.45$; L2 T2: $r_s = 0.17$, $p = 0.31$; SLI T1: $r_s = 0.33$, $p = 0.17$; SLI T2: $r_s = 0.4$, $p = 0.09$). With the exception of a couple of children from each group, both the SLI and L2 exhibited relatively strong group performance (> 90% accurate) with respect to verb morphology (see Figure 7-29). There were, nevertheless, individuals from both groups who produced rates of correct verb morphology that were lower than-1 *SD* of their own group mean (L2 T1: M = 93%, SD = 6; L2 T2: M = 96%, SD = 5; SLI T1: M = 91%, SD = 11; SLI T2: M = 95%, SD = 5). The children with SLI with relatively weak verb morphology at T1 included those who were younger (KIB: 52% and ROA: 76%). The L2 children who produced correct verb morphology at rates that were lower than -1 *SD* of their own group mean at T1 included three L2 children with 11 months exposure (HAS: 77% correct, MAS: 82%; EMH: 87%). At T2, the children with SLI with rates of correct verb morphology below -1 *SD* of their own group again included KIB (77%) and ROA (87%). For the L2ers at T2, LOS (79%), MAS (90.5%) and RHR (91%) had correct rates lower than -1 *SD* of the L2 mean. Recall that LOS and MAS had only 1;10 years exposure at T2. HAS and EMH also had only 1;10 and 1;11 years of exposure at T2, respectively, and were very accurate with respect to verb morphology (HAS: 100%; EMH: 98% at T2). The overall trend for verb morphology appears to indicate great overlap in the performance of both groups, as has been shown in previous studies on these learners of French. Although there is a certain amount of overlap, the child with SLI with the lowest accuracy for verb morphology is considerably less accurate than the L2 child with the weakest performance (compare KIB (52%) and HAS (77%)). More details about these children's performance for verb finiteness and tense choice will be given in the following sections.

Figure 7-29. Mean Rate of Correct Verb Morphology in the SLI, L2, and TD4 at T1.



7.3.5.2.1 Finiteness

An error in finiteness was counted in the case of so-called root infinitives (RIs) and in the case of matrix verb or auxiliary omission. As was observed for overall verb morphology, both groups were very accurate with respect to finiteness at both T1 and T2 (see Table 7-13). No significant group effect was found at T1 (H (2, 55) = 4.48, p = 0.106), but the effect was significant at T2 (H (2, 55) = 6.44, $p < 0.05$). Post hoc pairwise comparisons showed a significant difference between the L2 and the SLI at T2 (U = 127.5, $p < 0.04$). The difference between the L2 and the TD4 (U = 151 p = 0.9) was not significant, but there was a tendency towards significance between the SLI and TD4 (U = 86, p = 0.065) at T2.

Table 7-13. Mean Rate of Correct Finiteness in the SLI, L2, and TD4 at T1 at T2.

Correct finiteness				
		SLI	**L2**	**TD4**
T1	M	94.7	98.5	98.9
	SD	*12.1*	*4.2*	*2.5*
	Range	47-100%	80-100%	91-100%
T2	M	97.0	99.2	
	SD	*5.4*	*1.5*	
	Range	76-100%	95-100%	

Although the overall mean rate of correct production of finiteness was above 90%, the standard deviations indicate different amounts of variation in each population. As can be observed in Tables 7-14 and 7-15, only one L2 child produced more than 3 root infinitives or omission of finite verbs at T1; whereas, five children with SLI produced at least 4 errors of this type and one child with SLI, KIB, made 18 errors in finiteness at T1. No RIs were found in the TD4 data, but they did omit a handful of verbs (see Table 7-16).

Table 7-14. L2 Children with Errors in Finiteness at T1.

T1 Root Infinitives and Verb Omission in the L2 Group						
Child	Age	AoO	LoE	% correct finiteness	RI	Matrix verb or auxiliary omission
RHR	6;9	4;9	1;11	98.6	0	1
LOS	7;4	6;6	0;11	95.2	0	2
ALJ	7;8	5;6	2;3	98.5	0	1
HAS	9;1	8;2	0;11	80	7	2
LAD	9;7	5;10	3;8	98.4	1	0

Table 7-15.Children with SLI with Errors in Finiteness at T1.

T1 Root Infinitives and Verb Omission in the SLI Group				
Child	Age	% correct finiteness	RI	Matrix verb or auxiliary omission
KIB	6;5	47.1	10	8
ROA	6;8	88.7	1	5
JOC	7;4	98.4	0	1
SEL	8;6	92.6	0	4
THB	9;1	90.2	0	4
ELG	9;4	98.3	0	1
LUM	10;4	98.3	0	1
ANE	10;5	97.7	0	1
NIP	11;4	91.5	0	4
CLF	11;6	96.2	1	1

Table 7-16. TD4 Children with Errors in Finiteness at T1.

T1 Root Infinitives and Verb Omission in the TD4 group				
Child	Age	% correct finiteness	RI	Matrix verb or auxiliary omission
CEL	4;8	98.8	0	1
MAR	4;8	90.9	0	5
SIM	4;8	98.1	0	1
ELO	4;9	96.4	0	2

The L2-SLI comparison of correct finiteness at T2 is numerically similar to T1; however, the results of the statistical analyses revealed a significant difference between the SLI and L2 at T2 only. Although one particular child with SLI, KIB, sharply reduced his number of errors in finiteness from 18 at T1 to 8 at T2, the overall number of children with SLI with an error in finiteness did not decrease. There were 10 children with SLI with errors in finiteness at T1 (10/19 = 53%) and 11 at T2 (58%).

The L2 children at T2 who produced more than one error in finiteness were in the group with the shortest amount of exposure, whereas the children with SLI who produced the greatest number of finiteness errors tended to be younger (e.g., KIB, ROA and SEL). The L2 child, HAS, who had 11 months of exposure at T1 produced the highest number of root infinitives (7 at T1) out of all of the L2 children. At T2, he produced zero; however, his sisters (LOS and MAS) produced 2 and 1 root infinitives, respectively, at T2. Notice that HAS, aged 9;1 at T1, is generally older than the other children with SLI who produced root infinitives the most frequently (e.g., KIB, ROA and SEL, see Table 7-15). In this way, it seems that younger children with SLI can differ from younger L2 children with respect to finiteness, if the L2 children have had sufficient LoE, which appears to be about one year in the group studied here. The results for finiteness seem to suggest that the L2 have fewer problems with this property than the SLI, and that the L2 children may resolve the issues they have with finiteness in a relatively quick manner. Although problems with finiteness are present in some children, the majority of the children with SLI and L2 have no errors in finiteness and those children who do generally only make a couple of errors of this type. This pattern seems to point to the idea that the root infinitive stage is not a prominent characteristic of the development of French in the children studied here.

Table 7-17. L2 Children with Errors in Finiteness at T2.

T2 Root Infinitives and Verb Omission in the L2 Group						
Child	Age	AoO	LoE	% correct finiteness	RI	Matrix verb or auxiliary omission
RHR	7;9	4;9	2;11	97.6	0	2
PUS	8;1	4;6	3;8	98.4	0	1
LOS	8;4	6;6	1;10	94.9	1	3
EMH	10;3	8;4	1;11	99	0	1
HOS	11;8	8;1	3;8	98.6	0	1
MAS	12;4	7;11	1;10	95.1	3	1

Table 7-18. Children with SLI with Errors in Finiteness at T2.

T2 Root Infinitives and Verb Omission in the SLI group				
Child	Age	% correct finiteness	RI	Matrix verb or auxiliary omission
KIB	7;7	76.5	3	5
ROA	7;9	91.7	1	3
JOC	8;4	96.8	0	2
MAB	8;7	94.8	0	3
SEL	9;6	98.0	0	1
THB	10;1	95.3	0	2
ELG	10;7	98.0	0	1
COD	11;6	98.2	0	1
CLF	12;5	98.0	0	1
ERG	13;4	98.2	0	1
QUL	14;2	98.2	0	1

Previous research on children learning French as an L2 having focused on root infinitives and other properties associated with finiteness, a more qualitative examination of errors in finiteness will be presented here. Recall from Chapter 5 that nominative clitics in French need a finite verb as a host. Therefore, the occurrence of a nominative clitic with a non-finite verb is ungrammatical and is something that is found extremely rarely in TD L1 acquisition (see Chapter 2). However, as was made clear by the results presented in this section, RIs and verb omission were somewhat marginal phenomena in this group of L2 children and children with SLI, and therefore, there are not very many examples to work with. However, differences with respect to the subjects of RIs in each group can be observed: The children with SLI tended to omit subject clitics (as in (102)), use protoforms, such as [e] in place of subject clitics (PFM in (104)),[94] or use nominative clitics (103). In contrast, the L2 children, who very rarely omitted subjects and never used protoforms, produced nominative clitics with RIs (as in (105)-(106)). In French, finite verbs precede negative adverbs, so in (104), the position of the adverb *pas* indicates the verb is in fact non-finite. Although there are no adverbs in the L2 examples, one could potentially argue that these verbs are in fact syntactically finite, but were produced with non-finite morphology. MAS's use of the irregular verb *s'asseoir* 'sit' ([saswar]) in (105) is a good example of a verb that is less frequently used in the present tense. The imperative and past tense of the form (*assis*) [asi] is more often employed. It is quite possible in this case that MAS simply did not know what the present tense form of this verb was (*m'assieds*) [masje]. The use of the infinitive as a finite form by default has been observed in prior work on adult L2 learners (Prévost & White 2000). The three RIs that MAS produced concerned this verb. From the few examples of root infinitives that were observed in the data, it does seem that the characteristics of RIs in the L2 group differ from the SLI.

(102) EXP: tu vas pas partir un petit peu ?
you go not leave.INF un little
'will you be leaving home for awhile?'
KIB: si des fois.
yes sometimes
KIB: partir.
leave.INF (KIB, SLI, T2)

(103) des fois avec ma maman on **partir** [= part] dans les forêts faire des petites promenades.
some times with my mom one.CL.NOM leave.INF in the forests to-do some small walk
'sometimes with my mom we go to the forest to take some short walks' (KIB, SLI, T2)

(104) **é** pas allé au ski. [= il est pas allé au ski]
PFM not go.PAST to the ski
'he did not go skiing' (ROA, SLI, T1)

[94] After careful examination of the patterns of protoform (PFM) use by the children with SLI, it was determined that these forms most likely were used in place of nominative clitics instead of auxiliary verbs.

(105) et normalement moi je m'asseoir [= m'assieds] là et je lis un livre.
and normally me.STR.PRO I cl.REFL sit.INF there and I read a book
(MAS, L2, T2)

(106) après si il ne travaille pas il aller [= va] en France pour visiter.
after if he NEG work not he.cl.NOM go.INF to France in.order.to visit
'after if he isn't working he goes to France to visit'
(HAS, L2, T1)

(107) et je le faire [= fais] chanter un des chansons d'Elvis Presley.
and I cl.ACC.3P do.INF sing.INF one of the songs of Elvis Presley
'and I make him sing one of Elvis Presley's songs'
(LAD, L2, T1)

7.3.5.2.2 Tense choice

Earlier work on the development of finiteness in French by L2 children and children with SLI proposed to consider the present tense as a type of default finite form (Jakubowicz et al. 1999; Jakubowicz 1999; Paradis & Crago 2000). These authors reported that children with SLI and L2 children overgeneralize the third person singular present to future and past tense contexts more frequently than TD children. Paradis & Crago (2000) showed that both the SLI and L2 groups were significantly more accurate in their use of present tense compared to the past and to the future, but there were no significant differences between their rates of past and future. Is this also the case for the present population, which includes children who are older and L2 children with a wider range of exposure? Do the data suggest that these children overgeneralize the present tense? The data on tense choice for the present study will be reported here in terms of the following measures: **1) Accuracy in present tense contexts (number of present tense verbs out of the number of obligatory contexts for the present tense), 2) Accuracy in all other tense contexts (number of future and past tense contexts out of the number of obligatory contexts for other tenses), and 3) Proportion of present tense contexts out of all tense contexts.**

Table 7-19 shows that all three groups performed similarly and accurately with respect to tense choice in present and in other tense contexts. There were no significant between-group differences at T1 or T2 for these measures.[95] Interestingly, within-group analyses revealed that both the SLI and the L2 were significantly more accurate with the present tense compared to

[95] T1: past and future tense: H (2, 54) = 0.73, p = 0.69; present: H (2, 55) = 2.97, p = 0.23; T2: past and future tenses: H (2, 55) = 1.93, p = 0.38; present: H (2, 55) = 0.43, p = 0.81

other tenses at T1 and T2;[96] whereas this difference only tended towards significance in the TD4 (Z = 1.8, p = 0.07). Analyses of longitudinal performance indicated that the L2 progressed in non-present tense choice over the 12-month period, whereas the same progress was not observed in the SLI. The L2 did not improve significantly for the present tense due to ceiling effects, whereas the SLI tended to improve for the present tense, but did not differ significantly from T1 to T2 for the other tenses.[97] In other words, the statistical analyses indicate that, as a group, the L2 children had already reached stable performance in the present tense, but continued to improve their performance in other tense contexts. On the other hand, the SLI were still improving their accuracy in the present tense and had variable performance in other tenses.

Table 7-19. Correct Tense Choice at T1 and T2 in the SLI, L2, and TD4.

Tense Choice						
		SLI T1	**L2 T1**	**TD4**	**SLI T2**	**L2 T2**
Correct Present (%)	M	94.04	97.83	97.73	97.50	98.26
	SD	*11.61*	*5.76*	*3.07*	*5.23*	*2.78*
	Range	50-100%	73-100%	90-100%	78-100%	90-100%
Correct Non-Present (%)	M	80.22	88.89	93.96	89.14	95.81
	SD	*28.93*	*16.84*	*6.67*	*14.85*	*5.45*
	Range	0-100%	25-100%	75-100%	50-100%	83-100%

Although the SLI and L2 groups made correct tense choices in present contexts more often than in non-present tense contexts, the future, past and present tenses were all overgeneralized, as can be seen in Tables 7-20 and 7-21. Seven out of 22 (32%) L2 children, 3 out of 19 (16%) children with SLI and 5 out of 14 TD4 children (38%) made more errors in which the future or past tense was overused compared to errors in which the present was overgeneralized (see grey cells in Tables 7-20 and 7-21 and Table 7-22 for the TD4). In other words, the tense errors did not appear to be unidirectional, as some future and past tenses were produced when the present was expected (as in (108)-(109)).

(108) non mais c'est parce que j'ai peur qu' il y ait un ski qui allait tomber [= tombe] [..]
no but it's because I am scared that there is a ski that was-going to fall [= falls]
(WRS, L2, T1)

[96] T1: SLI: $Z = 2.95$, $p < 0.01$; L2: $Z = 3.11$, $p < 0.01$; T2: SLI: $Z = 2.62$, $p < 0.01$; L2: $Z = 2.10$, $p < 0.05$
[97] SLI: present tense: $Z = 1.71$, $p = 0.08$; L2: present: $Z = 0.53$, $p = 0.59$; non-present: $Z = 2.1$, $p < 0.05$

(109) EXP: au pas pour sauter c'est sûr que c'est pas évident
at a walk in.order.to jump it is sure that it is not easy
'(horse) jumping at a walk is certainly not easy'
IOC: au trot ça va être [= est] facile mais ça va pas être assez vite
at-a trot it goes to-be [= is] easy but it goes not to-be enough fast
'at a trot it's easy but it's not fast enough'

Table 7-20. Tense Choice Errors at T1 in the L2 Group.

T1 Tense choice in the L2 group							
Child	Age	AoO	LoE	% Correct All Tenses	Total tense errors (#)	Overgen. of present tense (#)	Overgen. of non-present tense (#)
RHR	6;9	4;9	1;11	88.9	8	5	3
PUS	7;1	4;6	2;7	98.3	1	0	1
ALC	7;4	5;9	1;7	96.1	2	0	2
LOS	7;4	6;6	0;11	100.0	0	0	0
ALJ	7;8	5;6	2;3	97.0	2	1	1
BEA	8;9	5;4	3;5	98.3	1	0	1
IOC	8;9	5;1	3;8	100.0	0	0	0
WRS	8;9	6;2	2;7	94.6	4	2	2
LEP	9;0	6;0	3;1	97.2	1	1	0
HAS	9;1	8;2	0;11	93.3	3	1	2
EMH	9;4	8;4	0;11	98.8	1	1	0
LAD	9;7	5;10	3;8	96.9	2	1	1
MER	9;10	7;11	1;11	100.0	0	0	0
HEA	10;1	6;8	3;5	98.6	1	1	0
HOS	10;8	8;1	2;7	98.7	1	0	1
SAJ	11;1	8;4	2;9	98.0	1	0	1
DAD	11;3	7;7	3;9	98.7	1	1	0
MAS	11;4	10;5	0;11	96.4	2	2	0
LIB	11;8	7;8	4;0	100.0	0	0	0
RAG	12;0	8;2	3;11	98.6	1	1	0
LOC	12;3	10;9	1;5	90.0	4	3	1
ALP	12;7	9;7	3;1	100.0	0	0	0
M				**97.2**	**1.6**	**0.9**	**0.7**
SD				*3.1*	*1.8*	*1.2*	*0.9*
# Total					36	20	16

Table 7-21. Tense Choice Errors at T1 in the SLI Group.

T1 Tense choice in the SLI group					
Child	Age	% Correct All Tenses	Total tense errors (#)	Overgen. of present tense (#)	Overgen. of non-present tense (#)
KIB	6;5	100.0	0	0	0
ROA	6;8	96.2	2	2	0
JOC	7;4	93.4	4	0	4
MAB	7;7	100.0	0	0	0
JEM	8;4	97.3	2	1	1
SEL	8;6	96.3	2	2	0
THB	9;1	95.1	2	2	0
FLC	9;1	100.0	0	0	0
ELG	9;4	94.9	3	1	2
LUM	10;4	95.0	3	2	1
ANE	10;5	100.0	0	0	0
COD	10;7	97.8	1	0	1
DYR	11;2	97.4	1	1	0
CLH	11;4	100.0	0	0	0
NIP	11;4	97.9	1	1	0
BRR	11;5	98.4	1	1	0
CLF	11;6	100.0	0	0	0
ERG	12;2	100.0	0	0	0
QUL	12;11	100.0	0	0	0
M		**97.9**	**1.2**	**0.7**	**0.5**
SD		*2.2*	*1.3*	*0.8*	*1.0*
# Total			22	13	9

Table 7-22. Tense Choice Errors in the TD4 Group.

T1 Tense choice in the TD4 Group				
Child	% Correct All Tenses	Total tense errors (#)	Overgen. of present tense (#)	Overgen. of non-present tense (#)
ALB	97.1	2	0	2
CEL	97.6	2	2	0
CLE	98.0	1	0	1
ELO	98.2	1	1	0
ERW	100.0	0	0	0
INE	93.4	4	0	4
LOL	98.2	1	1	0
LUC	100.0	0	0	0
MAR	96.4	2	0	2
MIL	98.0	1	0	1
PAU	96.7	2	1	1
ROB	98.6	1	1	0
ROM	95.5	2	0	2
SIM	100.0	0	0	0
M	**97.7**	**1.4**	**0.4**	**0.9**
SD	*1.8*	*1.1*	*0.6*	*1.2*
# Total		19	6	13

Table 7-23. Tense Choice Errors at T2 in the L2 Group.

T2 Tense Choice in the L2 Group							
Child	Age	AoO	LoE	% Correct All Tenses	Total tense errors (#)	Overgen. of present tense (#)	Overgen. of non-present tense (#)
RHR	7;9	4;9	2;11	92.9	6	3	3
PUS	8;1	4;6	3;8	100.0	0	0	0
ALC	8;4	5;9	2;7	98.0	1	0	1
LOS	8;4	6;6	1;10	94.9	4	1	3
ALJ	8;10	5;6	3;4	100.0	0	0	0
BEA	9;8	5;4	4;5	100.0	0	0	0
IOC	9;9	5;1	4;8	93.4	5	1	4
WRS	9;10	6;2	3;8	100.0	0	0	0
LEP	10;2	6;0	4;2	96.4	2	1	1
HAS	10;0	8;2	1;10	100.0	0	0	0
EMH	10;3	8;4	1;11	100.0	0	0	0
LAD	10;6	5;10	4;8	98.4	1	0	1
MER	10;10	7;11	2;11	100.0	0	0	0
HEA	11;1	6;8	4;5	98.0	1	0	1
HOS	11;8	8;1	3;8	100.0	0	0	0
SAJ	12;3	8;4	3;11	100.0	0	0	0
DAD	12;3	7;7	4;8	97.7	2	0	2
MAS	12;4	10;5	1;10	96.3	3	2	1
LIB	12;8	7;8	4;11	98.3	1	1	0
RAG	13;1	8;2	4;11	98.8	1	0	1
LOC	13;3	10;9	2;6	98.6	1	1	0
ALP	13;8	9;7	4;2	100.0	0	0	0
M				**98.3**	**1.3**	**0.5**	**0.8**
SD				*2.2*	*1.8*	*0.8*	*1.2*
# Total					28	10	18

Table 7-24. Tense Choice Errors at T2 in the SLI Group.

T2 Tense choice in the SLI group					
Child	Age	% Correct All Tenses	Total tense errors (#)	Overgen. of present tense (#)	Overgen. of non-present tense (#)
KIB	7;7	100.0	0	0	0
ROA	7;9	95.8	2	2	0
JOC	8;4	100.0	0	0	0
MAB	8;7	100.0	0	0	0
JEM	9;6	98.1	1	0	1
SEL	9;6	100.0	0	0	0
THB	10;1	100.0	0	0	0
FLC	10;2	100.0	0	0	0
ELG	10;7	100.0	0	0	0
LUM	11;4	98.8	1	0	1
ANE	11;8	98.3	1	1	0
COD	11;6	100.0	0	0	0
DYR	12;2	100.0	0	0	0
CLH	12;4	100.0	0	0	0
NIP	12;5	98.1	1	1	0
BRR	12;6	100.0	0	0	0
CLF	12;5	95.9	2	1	1
ERG	13;4	100.0	0	0	0
QUL	14;2	100.0	0	0	0
M		**99.2**	**0.4**	**0.3**	**0.2**
SD		*1.4*	*0.7*	*0.6*	*0.4*
# Total			8	5	3

Furthermore, comparing the patterns in tense and finiteness, a greater number of children had errors in tense choice than finiteness. The children who had the most errors in finiteness were not necessarily the same children who made tense choice errors. One reason for this could be the avoidance of non-present tense contexts by some children. In general, the present tense was used significantly more frequently by all children at T1,[98] as can be observed in Tables 7-25 - 7-27. However, group comparisons revealed that the proportion of present tense contexts out of all tense contexts is similar across all three groups at T1 (H (2, 55) = 1,12, p = 0.57). This suggests that the SLI and L2 employed the present tense with the same frequency as the TD4 and that neither the SLI nor the L2 avoided future or past tenses any more than the TD4.

[98] L2: $Z = 3.17$, $p < 0.001$; SLI: $Z = 3$, $p < 0.01$; TD4: $Z = 3.3$, $p < 0.001$

However, the higher standard deviations in the SLI and L2 groups suggest greater within-group variation. For example, children such as KIB (SLI), LOS (L2) and MAS (L2) were shown in a previous section (7.3.5.2.1) to have produced errors in finiteness, but these same children had no tense choice errors. Tables 7-25 and 7-26 revealed that these children had very few obligatory contexts for tenses other than the present. In fact, 8 out of the 22 L2 children (36%) had fewer than 30% (the TD4 mean) non-present tense contexts at T1 (see grey lines in Tables 7-25 to 7-27). There were 12 children with SLI (63%) and 6 out of 14 children (43%) in the TD4 group with this pattern. The difference in proportions between the SLI and L2 groups is not significant ($\chi^2 = 0.53$, $p = 0.47$). These individual results seem to indicate that past and future tense contexts are avoided by a certain number of individuals in each of the different learner groups and that the proportion of individuals with this pattern is numerically, but not significantly, higher in the SLI compared to the L2. In the L2 group, 3 out of the 4 children with 0;11 LoE and 6 older children (compared to only 2 younger children) had < 30% non-present contexts (recall that the break between older and younger groups in the L2 is between HAS and EMH. EMH is in the 9-12 L2 group in order to more evenly distribute children with low LoE). In the SLI group, 7 younger children and 5 older children had 30% non-present contexts (recall that the break between older and younger groups in the SLI is between ELG (6-9) and LUM (9-12)). In the SLI, therefore, this pattern is more evenly distributed across ages. Therefore, once again, we see a pattern in which the younger L2 children have more targetlike performance than the younger children with SLI. On the other hand, the older L2 children and children with SLI have more similar performance.

Table 7-25. Proportion of Present vs Non-present Tense Contexts in the L2 Group at T1.

T1 Proportion of Present vs Non-present Obligatory Contexts in the L2 Group					
Child	Age	AoO	LoE	Present Contexts (%)	Non-present Contexts (%)
RHR	6;9	4;9	1;11	54.2	45.8
PUS	7;1	4;6	2;7	41.7	58.3
ALC	7;4	5;9	1;7	66.7	33.3
LOS	7;4	6;6	0;11	97.5	2.5
ALJ	7;8	5;6	2;3	87.9	12.1
BEA	8;9	5;4	3;5	67.8	32.2
IOC	8;9	5;1	3;8	73.8	26.2
WRS	8;9	6;2	2;7	43.2	56.8
LEP	9;0	6;0	3;1	77.8	22.2
HAS	9;1	8;2	0;11	82.2	17.8
EMH	9;4	8;4	0;11	86.4	13.6
LAD	9;7	5;10	3;8	81.3	18.8
MER	9;10	7;11	1;11	60.9	39.1
HEA	10;1	6;8	3;5	44.9	55.1
HOS	10;8	8;1	2;7	40.3	59.7
SAJ	11;1	8;4	2;9	84.0	16.0
DAD	11;3	7;7	3;9	73.1	26.9
MAS	11;4	10;5	0;11	92.7	7.3
LIB	11;8	7;8	4;0	91.8	8.2
RAG	12;0	8;2	3;11	63.0	37.0
LOC	12;3	10;9	1;5	60.0	40.0
ALP	12;7	9;7	3;1	92.5	7.5
M				**71.1**	**28.9**
SD				*18.1*	*18.1*

Table 7-26. Proportion of Present vs Non-present Tense Contexts in the SLI Group at T1.

T1 Proportion of Present vs Non-present Obligatory Contexts in the SLI Group			
Child	Age	Present Contexts (%)	Non-present Contexts (%)
KIB	6;5	88.2	11.8
ROA	6;8	78.4	21.6
JOC	7;4	93.3	6.7
MAB	7;7	96.4	3.6
JEM	8;4	41.3	58.7
SEL	8;6	88.9	11.1
THB	9;1	77.5	22.5
FLC	9;1	97.1	2.9
ELG	9;4	44.1	55.9
LUM	10;4	51.7	48.3
ANE	10;5	65.1	34.9
COD	10;7	45.7	54.3
DYR	11;2	97.4	2.6
CLH	11;4	95.6	4.4
NIP	11;4	28.3	71.7
BRR	11;5	76.3	23.7
CLF	11;6	100.0	0.0
ERG	12;2	76.2	23.8
QUL	12;11	39.7	60.3
M		**72,7**	**27,3**
SD		*23,7*	*23,7*

Table 7-27. Proportion of Present vs Non-present Tense Contexts in the TD4 Group at T1.

T1 Proportion of Present vs Non-present Obligatory Contexts in the TD4 Group		
Child	Present Contexts (%)	Non-present Contexts (%)
ALB	67.1	32.9
CEL	75.3	24.7
CLE	79.6	20.4
ELO	64.3	35.7
ERW	90.5	9.5
INE	71.4	28.6
LOL	66.1	33.9
LUC	78.1	21.9
MAR	62.3	37.7
MIL	64.7	35.3
PAU	51.7	48.3
ROB	67.6	32.4
ROM	81.8	18.2
SIM	64.2	35.8
M	**70.3**	**29.7**
SD	*9.9*	*9.9*

At T2, a similar picture emerges concerning the proportion of present tense contexts. At T2, there was no significant group effect (H (2, 55) = 1.72, p = 0.42). In other words, the SLI, L2, and TD4 did not differ significantly in their frequency of use of the present tense. As shown in Tables 7-28 to 7-29, 10 of the 22 L2 children and 13 out of 19 children with SLI had fewer than 30% future or past contexts at T2. Comparing with the results from T1, neither the SLI nor the L2 increased their proportion of obligatory contexts for non-present tenses. Again at T2, one can see that the younger L2 children tend to have more obligatory contexts for non-present tenses compared to the younger children with SLI. However, the older children with SLI and the older L2 children have similar performance.

Table 7-28. Proportion of Present vs Non-present Tense Contexts in the L2 Group at T2.

T2 Proportion of Present vs Non-present Obligatory Contexts in the L2 Group					
Child	Age	AoO	LoE	Present Contexts (%)	Non-present Contexts (%)
RHR	7;9	4;9	2;11	41.2	58.8
PUS	8;1	4;6	3;8	98.4	1.6
ALC	8;4	5;9	2;7	62.5	37.5
LOS	8;4	6;6	1;10	69.6	30.4
ALJ	8;10	5;6	3;4	84.4	15.6
BEA	9;8	5;4	4;5	64.8	35.2
IOC	9;9	5;1	4;8	29.3	70.7
WRS	9;10	6;2	3;8	66.7	33.3
LEP	10;2	6;0	4;2	45.5	54.5
HAS	10;0	8;2	1;10	91.2	8.8
EMH	10;3	8;4	1;11	85.9	14.1
LAD	10;6	5;10	4;8	79.0	21.0
MER	10;10	7;11	2;11	85.7	14.3
HEA	11;1	6;8	4;5	60.0	40.0
HOS	11;8	8;1	3;8	90.0	10.0
SAJ	12;3	8;4	3;11	90.0	10.0
DAD	12;3	7;7	4;8	77.9	22.1
MAS	12;4	10;5	1;10	59.3	40.7
LIB	12;8	7;8	4;11	86.2	13.8
RAG	13;1	8;2	4;11	68.8	31.3
LOC	13;3	10;9	2;6	48.6	51.4
ALP	13;8	9;7	4;2	62.5	37.5
M				**70.3**	**29.7**
SD				*18.4*	*18.4*

Table 7-29. Proportion of Present vs Non-present Tense Contexts in the SLI Group at T2.

T2 Proportion of Present vs Non-present Obligatory Contexts in the SLI Group			
Child	Age	Present Contexts (%)	Non-present Contexts (%)
KIB	7;7	79.4	20.6
ROA	7;9	55.3	44.7
JOC	8;4	80.0	20.0
MAB	8;7	75.0	25.0
JEM	9;6	76.9	23.1
SEL	9;6	95.9	4.1
THB	10;1	88.1	11.9
FLC	10;2	67.6	32.4
ELG	10;7	73.5	26.5
LUM	11;4	57.5	42.5
ANE	11;8	71.2	28.8
COD	11;6	74.5	25.5
DYR	12;2	79.4	20.6
CLH	12;4	82.3	17.7
NIP	12;5	42.3	57.7
BRR	12;6	93.0	7.0
CLF	12;5	83.7	16.3
ERG	13;4	66.7	33.3
QUL	14;2	73.2	26.8
M		**74.5**	**25.5**
SD		*13.0*	*13.0*

Summarizing, with respect to verb morphology, both the SLI and the L2 were fairly accurate. Few individuals produced root infinitives or omitted verbs in finite contexts. However, these occurrences were more frequent in the SLI population. The data on tense choice do not reveal strong evidence for a stage in which the present is used as the default tense. Several individuals in all three groups made errors in which a past or future tense was used when a different tense type was expected, which suggests that they are not defaulting to the present tense. Overall, tense choice accuracy was high; however, this may be explained by the fact that several children in both groups had very few obligatory contexts for non-present tense. The SLI and L2 groups did not differ with respect to the proportion of obligatory contexts for present tense at T1 or T2. However, once again, the results show that the younger L2 children tend to have stronger performance compared to the younger SLI; whereas, the older L2 children more closely resemble the older SLI. More specifically, the younger L2 children displayed a more balanced pattern in the number of obligatory contexts for present versus non-present tense contexts, while younger SLI did not.

7.3.5.3 Object clitics

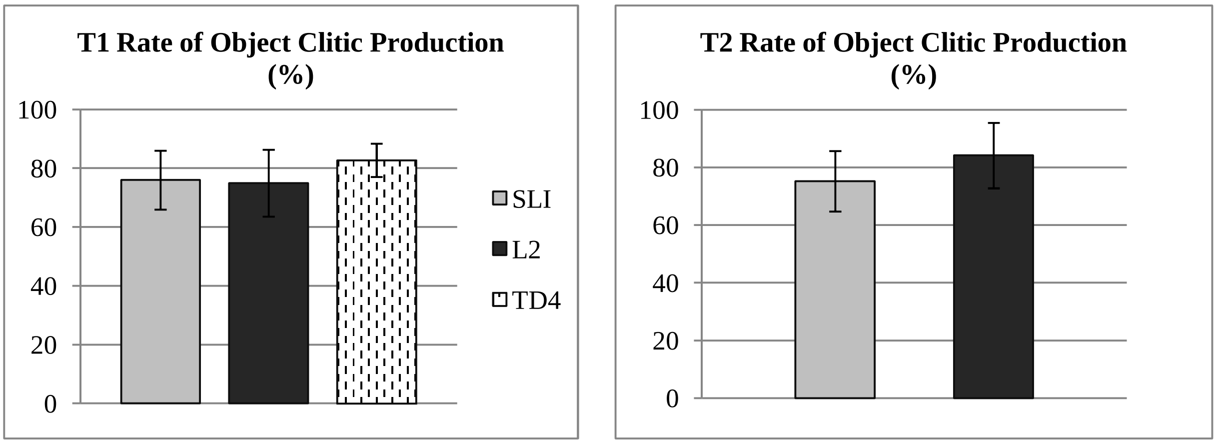
This section reports on the results concerning object clitic production. Previous work has revealed that children with SLI as well as L2 children produce object clitics at a significantly lower rate than language-matched controls (Paradis 2004; Grüter 2005). Are the same results found in the present group of L2 children and children with SLI? The first set of analyses concerns all types of object clitics (accusative, dative, reflexive, partitive, locative, see Section 5.5.3.2). Between- and within-group results will be examined with respect to error type (omission or substitution) and performance by age groups will also be reported. In a second set of analyses, the focus will be on third person accusative clitics.

7.3.5.3.1 Object clitic production

This section presents the rate of object clitic production. Excluding the children who had less than 3 contexts, what was the rate of production of object clitics in these three groups? Figure 7-30 indicates that the mean rate of production of object clitics[99] is quite high ($\geq$ 75%) in both groups at T1 and T2. A Kruskal-Wallis revealed no significant group effect at T1 or T2 (T1: H (2, 54) = 4.02, p = 0.13; T2: H (2, 55) = 3.72, p = 0.16). However, when looking at longitudinal development, the L2 progressed significantly between T1 and T2 (Z = 2.6, p < 0.01); whereas the same within-group difference was not significant in the SLI (Z = 0.2, p = 0.98). There are no significant correlations with CA in either of the two groups (T1: L2: r_s = -0.12, p = 0.61; SLI: r_s = 0.26; p = 0.29; T2: L2: r_s = 0.089, p = 0.69; SLI: r_s = 0.25; p = 0.30)

[99] Recall from Section 6.3.3.3.2.2 that the rate of object clitic production includes clitics that are produced with an error in number or gender.

Figure 7-30. Rate of Object Clitic Production in the SLI, L2, and TD4 at T1 and T2.



7.3.5.3.2 Third Person Accusative Clitic

Special consideration will be paid here to the production of the 3rd person singular and plural accusative clitic (3P ACC), as these forms have often been the focus of acquisition literature. The raw number of correct accusative clitics will be used here instead of percentages, which means that all children will be included, regardless of the number of 3P contexts in their language samples. Table 7-30 displays the group results for the production of 3P ACC at T1 and T2. At T1, there was no difference across groups (H (2, 55) = 4.3, p = 0.12). Concerning longitudinal progression, neither the L2 nor the SLI increased their production of 3P ACC clitics significantly from T1 to T2 (L2: Z = 0.99, p = 0.32; SLI: Z = 0.8 p = 0.42). At T2, a significant group effect was observed (H (2, 55) = 8.03, p < 0.05). The difference between the TD4 and the SLI was significant (U = 57, p = 0.0049) even with a fairly conservative alpha (0.01/2=0.005); however, the difference between the L2 and the SLI at T2 only tended towards significance (U = 141, p = 0.07).

Table 7-30. Mean Raw Number of 3P ACC in the SLI, L2, and TD4 at T1 and T2.

3P ACC Clitics (#)				
		SLI	**L2**	**TD4**
T1	M	2.5	2.6	3.9
	SD	*2.2*	*2.8*	*2.0*
	Range	0-7	0-9	0-7
T2	M	1.79	3.41	
	SD	*2.18*	*3.29*	
	Range	0-9	0-12	

There is no significant correlation between CA and the production of 3P ACC in the SLI or the L2 at T1 (r_s = 0.23, p = 0.92) or T2 (r_s = -0.15, p = 0.5), but comparing different age groups allows us to see that the 6-9 groups had similar performance at T1 (U = 41, p = 0.73), but that the younger L2 children produced a greater number of 3P ACC than the younger SLI at T2 (see Table 7-31). This difference at T2 tends towards significance (U = 23, p = 0.07). The difference between the older groups is not significant at T1 or T2 (T1: U = 58.5, p = 0.92; T2: U = 48, p = 0.43). The scatter plots in Figures 7-31 and 7-32 allow us to see variability in all four groups. At T2, four L2ers in the 6-9 group produced 4 or more 3P ACC; whereas, none of the children in the SLI 6-9 did.

Table 7-31. Mean Raw Number of 3P ACC per Age Group at T1 and T2.

3P ACC Clitics (#)								
		SLI 6-9	**L2 6-9**	***p***	**SLI 9-12**	**L2 9-12**	***p***
T1	M	2.1	2.0	ns	2.8	3.1	ns
	SD	*2.2*	*2.45*		*2.3*	*3.1*	
T2	M	1.44	3.6	.07	2.1	3.3	ns
	SD	*1.33*	*3.1*		*2.8*	*3.6*	

Figure 7-31. Number of 3P ACC per Child in the L2 and SLI 6-9 Groups at T1 and T2.

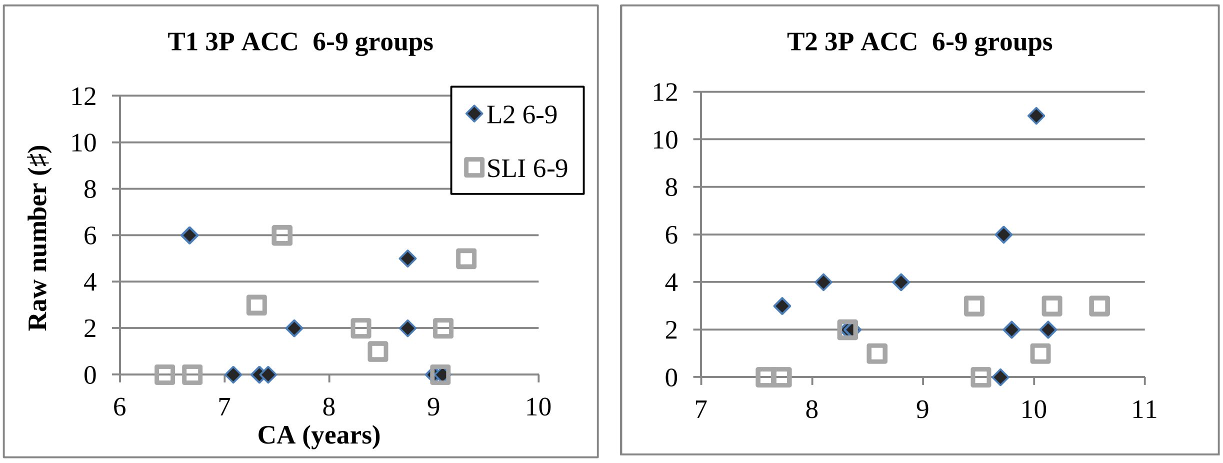
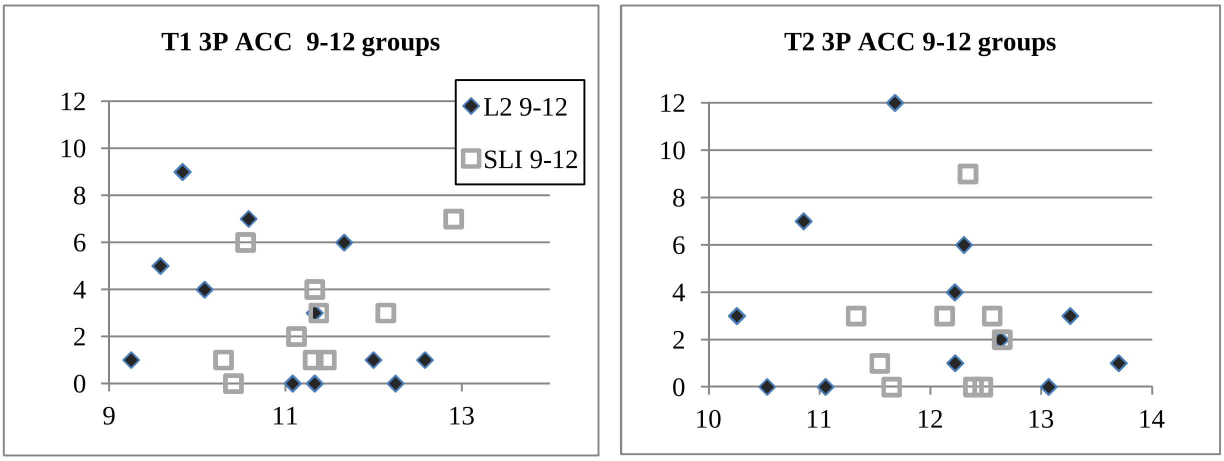


Figure 7-32. Number of 3P ACC per Child in the L2 and SLI 9-12 Groups at T1 and T2.



7.3.5.3.3 Object clitic error type diversity

The previous results allowed us to see that object clitics were produced in about 25% of obligatory contexts, on average (regardless of number and gender errors). This section will include number and gender errors and look at what types of errors were found in obligatory contexts for object clitics. In other words, the idea is to find out what type of error occurred when an object clitic was not produced correctly. Overwhelmingly, the most frequent error type at T1 was omission (total omissions / total errors for the group: L2: *n* = 59/78; SLI: *n* =50/62; TD4: *n* = 35/53). As can be seen in the proportion of error types reported in Figure 7-33, the other errors included a couple of strong pronoun errors (L2: *n* = 1; SLI: *n* = 1; TD4: *n* = 0 total group occurrences), case errors (L2: *n* = 6; SLI: *n* = 1; TD4: *n* = 3 total group occurrences), the use of a lexical DP instead of a clitic (L2: *n* = 4; SLI: *n* = 3 ; TD4: *n* = 5 total group occurrences), gender errors (L2 *n* = 2; SLI: *n* = 0; TD4: *n* = 1 total group occurrences), and number errors (L2: *n* = 2; SLI: *n* = 2; TD4: *n* = 0 total group occurrences).

Figure 7-33. Object Clitic Error Types in the SLI, L2, and TD4 at T1.

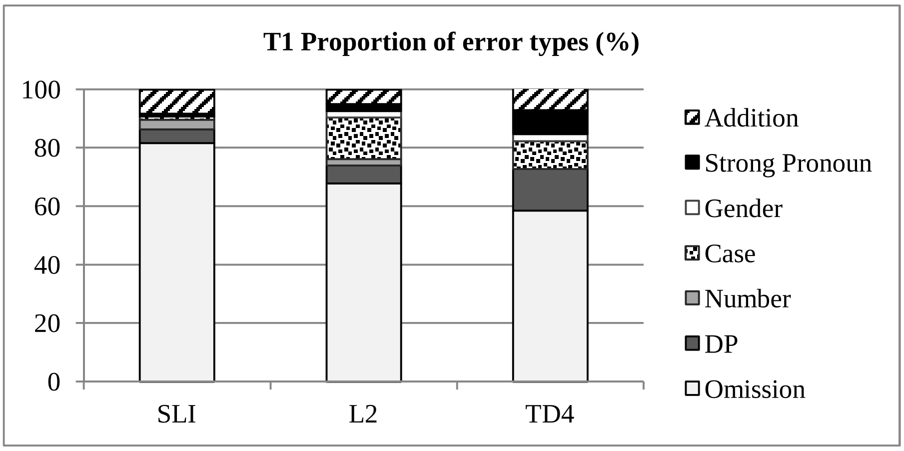
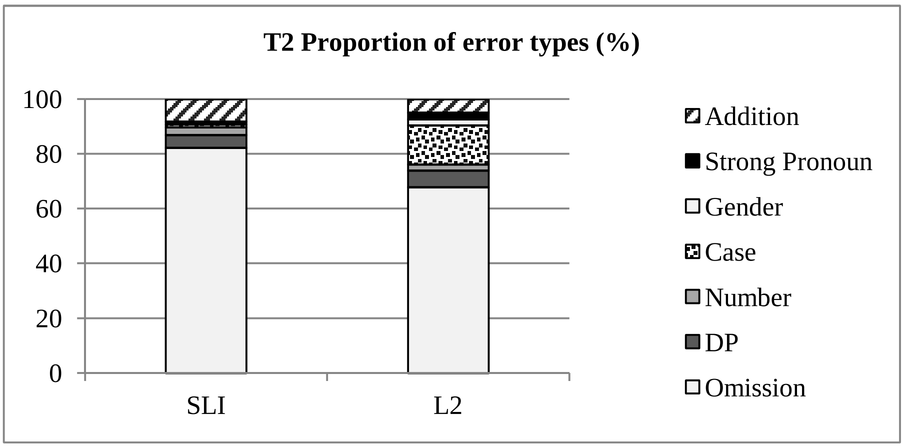


Figure 7-34. Object Clitic Error Types in the SLI and L2 at T2.



Although omission was by far the most frequent error, children from all groups also made addition errors (in which a clitic was produced in a context where one was not expected, as in 110) (L2: *n* = 4; SLI: *n* = 5; TD4: *n* = 9). There were very few errors in which a strong pronoun was produced instead of a clitic, which suggests that L1 transfer did not have a major affect the L2 performance (see an example of a rare error in (111)). The error pattern at T2 is quantitatively and qualitatively similar to T1, as shown in Figure 7-34. All in all, the results show that these groups had very similar error types.

(110) j' ai essayé de y [=0] aller faire du rugby à Vierzon.
I have tried COMP cl.LOC to.go do.INF some rugby at Vierzon
"I tried to go play rugby at Vierzon" (ALC, L2, T1)

(111) et les autres il faut qu' ils viennent nous toucher avant que le loup touche
and the others they must come us.ACC.1P touch.INF before that the wolf touches
eux [= les touche]
them.STR.PRO [= them.ACC.3P touches]. (ALJ, L2, T2)

(112) et puis après j(e) lui [= l'] ai poussé.
And then after I him.cl.DAT have pushed
"and then after I pushed him" (BEA, L2, T2)

The results in this section suggest that the SLI and the L2 overlap to a certain degree in their production of object clitics, as has been shown in previous work. However, the longitudinal data indicate that the L2 group improves over the 12-month period, while the SLI show no signs of improvement. When looking at age groups, it can be seen that, once again, the younger L2 children have stronger performance than the younger children with SLI; whereas the difference between the older groups is not as stark. With respect to error types, the L2 make very few errors in which a strong pronoun in canonical object position is substituted for a clitic. This echoes previous results on English-speaking children learning French as an L2 (Paradis 2004; White 1996), which have shown little evidence for transfer effects on the production of object clitics.

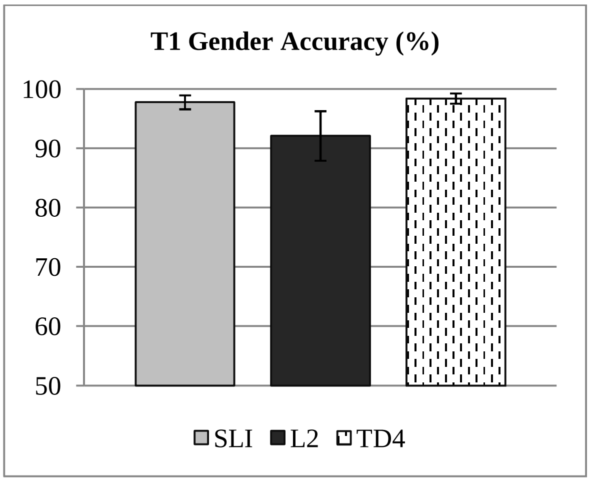
7.3.5.4 Gender

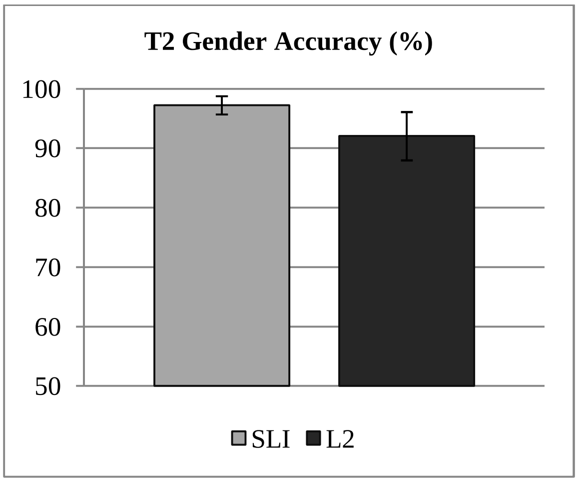
The overall difficulties that adult L2 learners have with gender acquisition have been widely documented (see White 2003 for a review). Paradis & Crago (2004) reported similar performance between SLI and L2 children for gender marking in spontaneous language. Will a similar pattern be found in the current population? As mentioned in Section 6.3.3.3.2.3, gender assignment on determiners, certain nouns and the quantifier *tout* 'all' will be included in this analysis, as well as gender concord on adjectives. The analysis is based on the number of tokens. This section discusses overall gender errors (concord and assignment) before focusing on the indefinite determiner. Recall from Section 6.3.4 that when comparing the TD4, SLI, and L2, an alpha of $p < 0.04$ will be used as the upper limit for significance for the SLI-L2 comparison and $p < 0.005$ will be used for the other two comparisons (0.05-0.04=0.01; 0.01/2 = 0.005).

7.3.5.4.1 Overall gender accuracy

Figure 7.35 displays the overall correct percentage of gender marking out of all obligatory contexts in the L2, SLI and TD4 groups. A significant group effect was found at T1 and T2 (T1: H (2, 55) = 15.3 $p < 0.001$; T2: H (2, 55) = 9.4 $p < 0.01$). Although the group means for overall correct gender were quite high, the L2 group had significantly lower performance compared to both the SLI and the TD4 (T1: L2 vs. SLI: U = 86.5, p = 0.001; L2 vs. TD4: U = 53, p = 0.001). A similar result was also observed at T2 (L2 vs. SLI U = 123, p = 0.024; L2 vs. TD4: U = 71.5, p = 0.007); the difference between the L2 and TD4 reaches significance only if a less conservative alpha is considered. There is no significant difference between the SLI and the TD4 at T1 (U = 120, p = 0.62) or T2 (U = 102, p = 0.25). Neither the L2 nor the SLI improved significantly from T1 to T2 for overall correct gender agreement.

Figure 7-35. Accuracy with Grammatical Gender in the SLI, L2 and TD4 at T1 and T2.





7.3.5.4.2 Overuse of masculine or feminine

Figure 7-26 shows the accuracy rates for gender agreement in masculine versus feminine contexts. These measures allow us to see whether the L2 or SLI were more accurate in one context compared to the other. These data also allow us to explore whether there is evidence for a default gender choice or not. Comparing accuracy in masculine versus feminine gender, a significant group effect was found at T1 for masculine (H (2, 55) = 15.2, $p < 0.001$) and for feminine (H (2, 55) = 9.8, $p < 0.01$). The SLI group mean is significantly higher than the L2 for both feminine and masculine, although the difference is only marginally significant in feminine contexts (T1 SLI vs. L2: masculine U = 90, $p < 0.001$; SLI vs. L2: feminine U = 132, p = 0.039). The TD4 have significantly stronger performance in feminine contexts compared to the L2 at T1 (TD4 vs. L2 feminine: U = 65.5, p = 0.003). The difference between the TD4 and the L2 in masculine contexts at T1 reaches significance only if a less conservative alpha (0.05) is considered (TD4 vs. L2: masculine: $U = 88$, $p = 0.02$). There are no significant differences between the SLI and the TD4 at T1 (masculine: $U = 104$, $p = 0.09$; feminine: $U = 106$, $p = 0.27$).

At T2, there is no longer a significant group effect for accuracy in masculine (H (2, 55) = 2.2, $p = 0.3$) and feminine contexts (H (2, 55) = 1.6, $p = 0.442$), see Figure 7-36. Concerning longitudinal progression, accuracy in feminine contexts increased significantly in the L2 group from T1 to T2 ($Z = 2.64$, $p < 0.01$). Out of all groups and all measures, this was the only longitudinal difference to reach significance.

Figure 7-36. Correct Gender by Context in the SLI, L2, & TD4 at T1.

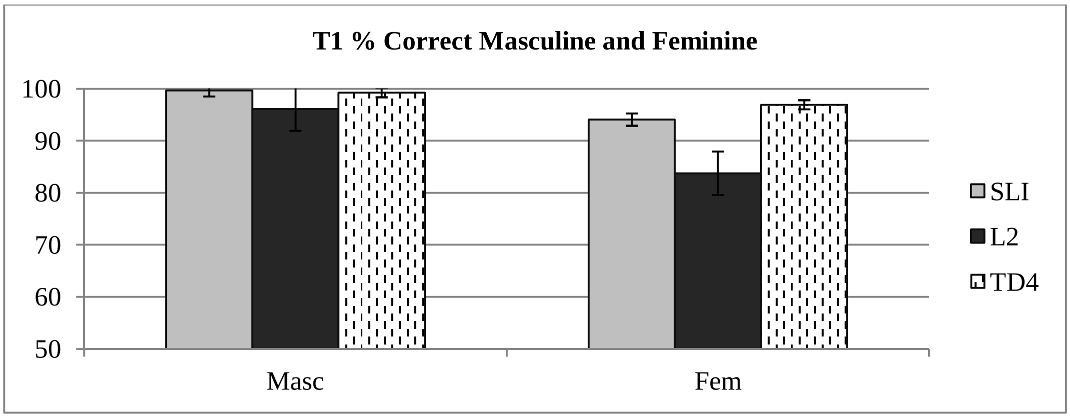
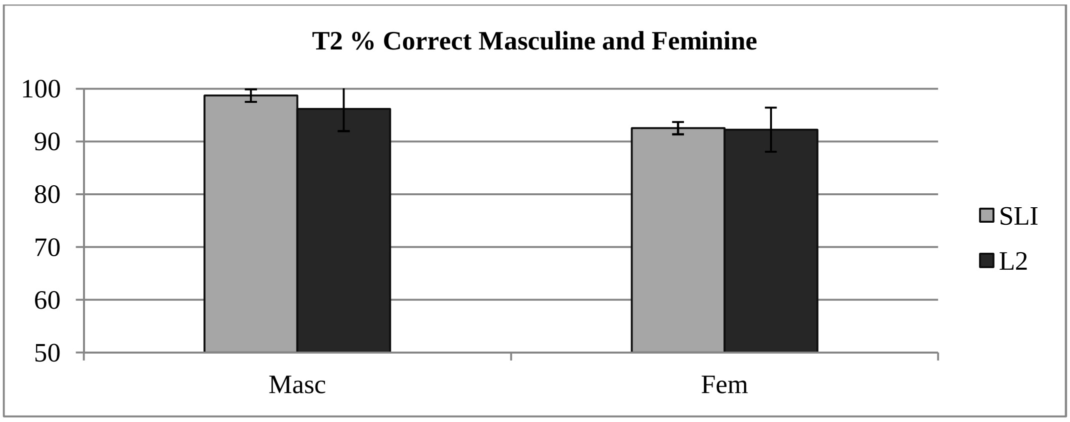


Figure 7-37. Correct Gender by Context in the SLI and L2 at T2.



As shown in the grey cells of Tables 7-32 to 7-34, at T1, 8 out of 22 L2 children made a higher number of errors in masculine contexts (overuse of feminine), while the other 14 children made errors in the other direction, preferring masculine over feminine. In contrast, only one out of 19 children with SLI overgeneralized the feminine. There were 4 out of 14 children who did so in the TD4 group. Furthermore, 11 out of the 22 L2 children made at least one error in both directions (see underlined cells); however, these children tended to overgeneralize the masculine more frequently (see MAS, for example). Overall, it appears that all groups tend to overgeneralize the masculine gender more often, but a handful of L2 children appeared to use the feminine form more frequently. The preference of the feminine over the masculine seems to be a rare occurrence in the SLI.

Tables 7-32 to 7-34 also indicate that both the young and old L2 had less accurate gender agreement than their age peers in the SLI group. Unlike what was observed for verb morphology and object clitics, the younger L2 were less accurate than the younger SLI for gender. This difference reached significance only for accuracy in masculine contexts at T1 ($U = 38$, $p < 0.01$). In contrast, the older SLI were significantly more accurate than the older L2 with respect to gender agreement for several measures at both T1 and T2 (T1: Overall Gender Accuracy $U = 20$, $p < 0.01$; Correct masculine: $U = 27$, $p < 0.05$; Correct feminine: $U = 28$, $p < 0.05$; T2: Overall Gender Accuracy: $U = 26$, $p < 0.05$).

Table 7-32. Gender Errors in Masculine & Feminine Contexts in the L2 Group at T1.

T1 Gender Errors in Masculine & Feminine Contexts in the L2 Group						
Child	Age	AoO	LoE	**Total Gender errors (#)**	**MASC in a FEM context (#)**	**FEM in a MASC context (#)**
RHR	6;9	4;9	1;11	6	1	5
PUS	7;1	4;6	2;7	3	1	2
ALC	7;4	5;9	1;7	0	0	0
LOS	7;4	6;6	0;11	3	2	1
ALJ	7;8	5;6	2;3	4	1	3
BEA	8;9	5;4	3;5	5	5	0
IOC	8;9	5;1	3;8	1	0	1
WRS	8;9	6;2	2;7	2	2	0
LEP	9;0	6;0	3;1	3	1	2
HAS	9;1	8;2	0;11	0	0	0
EMH	9;4	8;4	0;11	10	9	1
LAD	9;7	5;10	3;8	10	4	6
MER	9;10	7;11	1;11	6	5	1
HEA	10;1	6;8	3;5	3	2	1
HOS	10;8	8;1	2;7	1	0	1
SAJ	11;1	8;4	2;9	1	1	0
DAD	11;3	7;7	3;9	3	2	1
MAS	11;4	10;5	0;11	25	21	4
LIB	11;8	7;8	4;0	2	2	0
RAG	12;0	8;2	3;11	3	3	0
LOC	12;3	10;9	1;5	3	1	2
ALP	12;7	9;7	3;1	3	3	0
M				**4.4**	**3.0**	**1.4**
SD				*5.3*	*4.5*	*1.7*

XXX: Children who produced errors in both directions; XXX: Children who made a higher number of errors in masculine contexts

Table 7-33. Gender Errors in Masculine & Feminine Contexts in the SLI Group at T1.

T1 Gender Errors in Masculine & Feminine Contexts in the SLI Group				
Child	Age	**Total Gender errors (#)**	**MASC in a FEM context (#)**	**FEM in a MASC context (#)**
KIB	6;5	1	1	0
ROA	6;8	0	0	0
JOC	7;4	5	5	0
MAB	7;7	1	1	0
JEM	8;4	2	2	0
SEL	8;6	0	0	0
THB	9;1	1	1	0
FLC	9;1	0	0	0
ELG	9;4	0	0	0
LUM	10;4	0	0	0
ANE	10;5	0	0	0
COD	10;7	2	2	0
DYR	11;2	2	0	2
CLH	11;4	3	3	0
NIP	11;4	0	0	0
BRR	11;5	0	0	0
CLF	11;6	2	2	0
ERG	12;2	2	2	0
QUL	12;11	0	0	0
M		**1.1**	**1**	**0.1**
SD		*1.4*	*1.4*	*0.5*

XXX : Children who made a higher number of errors in masculine contexts

Table 7-34. Gender Errors in Masculine & Feminine Contexts in the TD4 Group at T1.

T1 Gender Errors in Masculine & Feminine Contexts in the TD4 group			
Child	**Total Gender errors (#)**	**MASC in a FEM context (#)**	**FEM in a MASC context (#)**
ALB	0	0	0
CEL	4	4	0
CLE	0	0	0
ELO	1	0	1
ERW	0	0	0
INE	1	0	1
LOL	0	0	0
LUC	1	1	0
MAR	2	2	0
MIL	1	0	1
PAU	1	0	1
ROB	0	0	0
ROM	1	1	0
SIM	2	2	0
M	**1**	**0.7**	**0.3**
SD	*1.1*	*1.2*	*0.5*

XXX : Children who made a higher number of errors in masculine contexts

A somewhat less obvious pattern was observed at T2 concerning patterns of overuse of one gender over another. Fewer L2 children overgeneralized the feminine more frequently than the masculine (only 4 out of 22) and a greater number of children with SLI (3 out of 19) overgeneralized the feminine at T2 compared to T1. Four L2 children and two children with SLI made errors in both directions at T2. Despite the higher number of children with SLI overusing the feminine at T2 compared to T1, the L2ers appeared to exhibit the pattern of overusing the feminine more frequently than the SLI. The SLI do not frequently entertain the possibility of using feminine instead of masculine gender, but the L2 data suggest that L2ers could go either way.

Table 7-35. Gender Errors in Masculine & Feminine Contexts in the L2 Group T2.

T2 Gender Errors in Masculine & Feminine Contexts in the L2 Group						
Child	Age	AoO	LoE	**Total Gender errors (#)**	**MASC in a FEM context (#)**	**FEM in a MASC context (#)**
RHR	7;9	4;9	2;11	1	1	0
PUS	8;1	4;6	3;8	0	0	0
ALC	8;4	5;9	2;7	0	0	0
<u>LOS</u>	8;4	6;6	1;10	<u>20</u>	<u>15</u>	<u>5</u>
ALJ	8;10	5;6	3;4	2	1	1
BEA	9;8	5;4	4;5	3	3	0
IOC	9;9	5;1	4;8	1	1	0
WRS	9;10	6;2	3;8	7	7	0
LEP	10;2	6;0	4;2	5	5	0
<u>HAS</u>	10;0	8;2	1;10	<u>7</u>	<u>4</u>	<u>3</u>
EMH	10;3	8;4	1;11	12	4	8
<u>LAD</u>	10;6	5;10	4;8	<u>4</u>	<u>2</u>	<u>2</u>
MER	10;10	7;11	2;11	3	1	2
HEA	11;1	6;8	4;5	5	5	0
HOS	11;8	8;1	3;8	1	1	0
SAJ	12;3	8;4	3;11	1	1	0
DAD	12;3	7;7	4;8	12	4	8
<u>MAS</u>	12;4	10;5	1;10	<u>16</u>	<u>12</u>	<u>4</u>
LIB	12;8	7;8	4;11	0	0	0
RAG	13;1	8;2	4;11	1	0	1
LOC	13;3	10;9	2;6	3	3	0
ALP	13;8	9;7	4;2	3	3	0
M				**4.8**	**3.3**	**1.5**
SD				*5.4*	*3.9*	*2.5*

<u>XXX</u> : Children who produced errors in both directions ; XXX : Children who made a higher number of errors in masculine contexts

Table 7-36. Gender Errors in Masculine & Feminine Contexts in the SLI Group at T2.

T2 Gender Errors in Masculine & Feminine Contexts in the SLI Group				
Child	Age	**Total Gender errors (#)**	**MASC in a FEM context (#)**	**FEM in a MASC context (#)**
KIB	7;7	1	1	0
ROA	7;9	5	3	2
JOC	8;4	2	2	0
MAB	8;7	0	0	0
JEM	9;6	2	0	2
SEL	9;6	1	1	0
THB	10;1	2	2	0
FLC	10;2	0	0	0
ELG	10;7	2	2	0
LUM	11;4	1	0	1
ANE	11;8	2	2	0
COD	11;6	2	1	1
DYR	12;2	1	1	0
CLH	12;4	1	0	1
NIP	12;5	0	0	0
BRR	12;6	0	0	0
CLF	12;5	0	0	0
ERG	13;4	3	3	0
QUL	14;2	0	0	0
M		**1.3**	**0.9**	**0.4**
SD		*1.3*	*1.1*	*0.7*

XXX : Children who produced errors in both directions ; XXX : Children who made a higher number of errors in masculine contexts

The examples in (113-117) highlight some of the fluctuation that the L2 children had with masculine and feminine gender. Examples (113-116) are from the same child (MAS) and the same sample (but are not contiguous). Notice that both the adjective and the indefinite determiner and the adjective can change from masculine to feminine forms, arguing against the idea of a strict default strategy.

(113) et nous veulons[100] acheter un [= une] maison.
and we want buy.INF a.MASC house.FEM

(114) avec une [= un] grand jardin.
with a.FEM big.MASC garden.MASC

(115) et une autre petit [= petite] maison pour les chiens.
and a.FEM other little.MASC house.FEM for the dogs

(116) mais le programme voit le [= la] petite fille danser.
but the program sees the.MASC little.FEM girl dance.INF ((113-116): MAS, L2, T1)

(117) on a une télévision à notre maison qui fait du [= de la] télévision anglaise.
one has a.FEM television.FEM in our house that does some.MASC television English.FEM
'we have a television in our house that has English television' (LAD, L2, T2)

7.3.5.4.3 Indefinite determiner errors

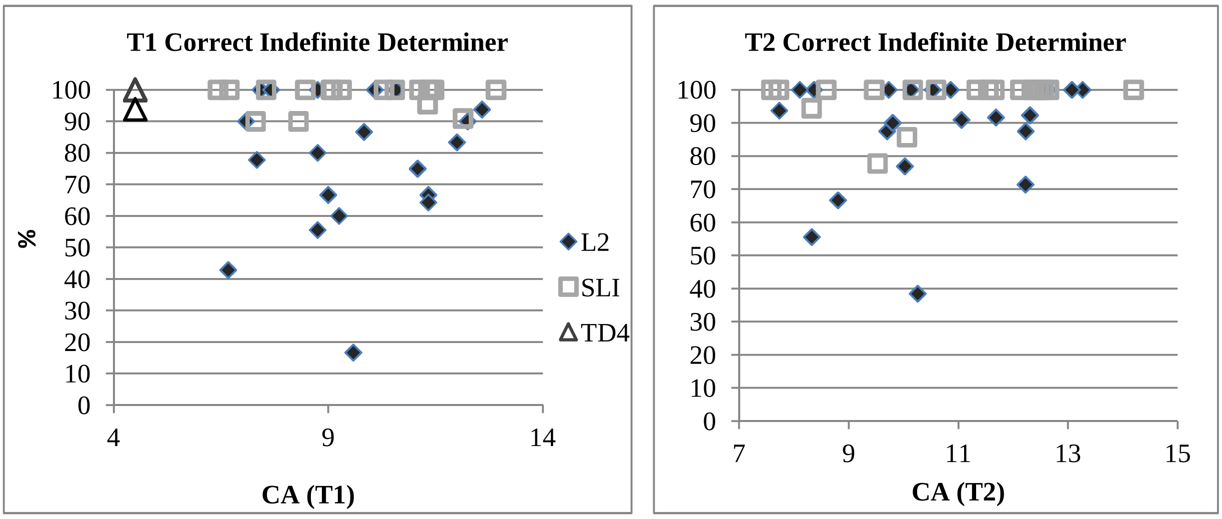
When examining accuracy in gender agreement by determiner type, the L2 group is found to have particular trouble with the indefinite determiner (see Table 7-37 and Figure 7-38). Although the number of contexts for the indefinite determiner varied from child to child,[101] the data suggest that gender agreement on this determiner is more prone to error than on the definite determiner. The difficulty observed here with the indefinite determiner compared to other determiners echoes what has also been found for L2 adults acquiring other languages with grammatical gender that is marked on the indefinite determiner (e.g., Spanish, see White 2003 for a review). Statistical analyses revealed a significant group effect for the rate of correct gender agreement on the indefinite determiner (H (2, 51) = 22.5, p < 0.0001) at T1 and at T2 (H (2, 53) = 13.0, p < 0.001). Results from post hoc pairwise comparisons echoed the pattern described in the previous section for accuracy in overall gender marking. The L2ers were significantly less accurate with gender assignment on the indefinite determiner compared to the SLI (T1: U = 60; p < 0.001; T2: U = 113; p < 0.01) and the TD4 (T1: U = 35.5; p < 0.001; T2: U = 63.5; p = 0.003). The difference between the SLI and TD4 for this measure was not significant (T1: U = 99; p = 0.26; T2: U = 113; p = 0.48).

[100] These examples can also contain other errors in addition to gender errors. For the sake of clarity, only gender errors will be noted.
[101] A minimum of three contexts was required for inclusion in the analyses of the percentage of correct indefinite determiner.

Table 7-37. Correct Gender on the Indefinite Determiner in the SLI, L2, & TD4 at T1 and T2.

Correct Indefinite Determiner (*un/une*) (%)					
		L2		**SLI**	**TD4**
T1	**M**	77.5	*	98.1	99.5
	SD	*22.2*		*3.8*	*1.7*
T2	**M**	87.7	*	97.8	
	SD	*16.9*		*5.9*	

Figure 7-38. Correct Gender on the Indefinite Determiner per Child and Group at T1 and T2.



Did the errors on the indefinite determiner reflect the choice of a default gender? Table 7-38 displays the number of errors per context at T1 and T2 in the L2 and Table 7-39 for the SLI. At T1, 5 L2 children make a higher number of errors in which the feminine is overused compared to the masculine (grey lines). Four L2ers made at least one error in both directions (underlined cells) at T1. Interestingly, out of the 5 L2ers with more instances of feminine overuse at T1, only DAD has a somewhat similar profile at T2 (one masculine error, one feminine error). At T2, a total of two L2ers overused the feminine more often than the masculine and 4 children made at least one error of each gender. Based on this set of data, it may be argued that children such as EMH at T1 have masculine as a default gender because she overused the masculine 4 times and never overused the feminine. However, looking at the same child's data at T2, EMH overused the feminine 6 times and the masculine twice. This seems to suggest that, if in fact some L2 children tend to use a default gender, then the default can change over time.

Table 7-38. Gender Errors on the Indefinite Determiner in the L2 Group at T1 & T2.

Gender Errors on the Indefinite Determiner per Context in the L2 Group at T1 & T2				
	T1		**T2**	
Child	Overuse of Masc. (*un*=*une*)	Overuse of Fem (*une*=*un*)	Overuse of Masc. (*un*=*une*)	Overuse of Fem (*une*=*un*)
RHR	0	4	1	0
PUS	0	1	0	0
ALC	0	0	0	0
LOS	2	0	3	1
ALJ	0	0	1	1
BEA	4	0	1	0
IOC	0	0	0	0
WRS	1	0	1	0
LEP	0	1	0	0
HAS	0	0	3	0
EMH	4	0	2	6
LAD	2	3	0	0
MER	1	1	0	0
HEA	0	0	1	0
HOS	0	0	1	0
SAJ	1	0	1	0
DAD	1	1	1	3
MAS	3	2	1	0
LIB	0	0	0	0
RAG	2	0	0	0
LOC	0	1	0	0
ALP	1	0	2	0
M	**1.0**	**0.6**	**0.9**	**0.5**
SD	*1.3*	*1.1*	*0.9*	*1.4*

As displayed in Table 7-39, the SLI have very few gender errors on the indefinite determiner at T1 or T2. Out of the 5 children who made gender errors, only one child overused the feminine. If we consider the sum of all of the indefinite determiner gender errors in the SLI group at both T1 and T2 (n = 9), then only two (22%) of these errors result from the overuse of the feminine gender. The lack of errors on the indefinite determiner in the SLI group prevents a clear conclusion from being drawn; however, the data suggest that the SLI overuse the masculine more often than the feminine and that the overuse of either gender is more strongly associated with TD L2 children.

Table 7-39. Gender Errors on the Indefinite Determiner in the SLI Group at T1 & T2.

Gender Errors on the Indefinite Determiner per Context in the SLI Group				
	T1		**T2**	
Child	Overuse of Masc. (*un*=*une)*	Overuse of Fem (*une*=*un*)	Overuse of Masc. (*un*=*une*)	Overuse of Fem (*une*=*un*)
KIB	0	0	0	0
ROA	0	0	0	0
JOC	1	0	1	0
MAB	0	0	0	0
JEM	1	0	0	2
SEL	0	0	0	0
THB	0	0	2	0
FLC	0	0	0	0
ELG	0	0	0	0
LUM	0	0	0	0
ANE	0	0	0	0
COD	0	0	0	0
DYR	0	0	0	0
CLH	1	0	0	0
NIP	0	0	0	0
BRR	0	0	0	0
CLF	0	0	0	0
ERG	1	0	0	0
QUL	0	0	0	0
M	**0.2**	**0.0**	**0.2**	**0.1**
SD	*0.4*	*0.0*	*0.5*	*0.5*

Unlike what was observed for verb morphology and object clitics, the L2 had significantly weaker performance than the SLI and the TD4 with respect to grammatical gender. The indefinite determiner was particularly prone to incorrect gender assignment, as has been shown to be the case for L2 adults. When the SLI made errors, the masculine form was typically overused, whereas more L2ers made gender errors in both directions. The results show that difficulty with gender agreement is poses a bigger challenge to the L2 group compared to the SLI.

Summarizing the major results from this section (7.3.5), the results concerning the rate of erroneous utterances and accuracy with verb morphology and object clitics show considerable overlap between the L2 and the SLI. For grammatical gender, the L2 were significantly less accurate than the SLI and TD4. Concerning longitudinal analyses for various measures, the results indicate that the L2 increase their accuracy from T1 to T2, while the SLI do not. For example, in Section 7.3.5.3, the L2 significantly increased their rate of object clitic production from T1 to T2, which was not the case for the SLI. As what was observed for clausal embedding, the younger SLI tended to have weaker performance compared to the younger L2; however, the older L2 have similar (or potentially weaker) performance than the older SLI. The age group comparisons of the rate of erroneous utterances and the number of 3P ACC exemplified this trend.

7.3.6 Errors and Clausal Embedding

As mentioned in Chapters 3 and 4, previous research has suggested that morphosyntactic errors are more frequent in structures that can arguably be characterized as complex (e.g., relative clauses, ditransitive verbs). One of the research questions formulated in the current study concerns the relationship, if any, between the frequency of utterances with an embedded clause, which are argued to be more complex than monoclausal utterances, and morphosyntactic errors in children with SLI and L2 children. The goal of this section is to attempt to respond to this question via group comparisons of morphosyntactic error distribution (i.e., the rate at which complex or simple utterances contain at least one error) and correlation analyses between measures of clausal embedding and morphosyntactic accuracy. This section is organized as follows: Section 7.3.6.1 discusses the rates of erroneous complex versus simple utterances. The rate of erroneous relative clauses will be examined in section 7.3.6.2. In Section 7.3.6.3, errors occurring in complex versus simple utterances will be presented. Finally, the link between error and clausal embedding frequency will be explored.

7.3.6.1 Rate of erroneous complex and erroneous simple utterances

In Section 7.3.2, analyses of clausal embedding measures revealed that the L2 used embedding more often than the SLI. It is assumed here that the frequency of a certain structure is in part indicative of the ease with which the same structure is produced. If the L2 use embedding with more ease, does this also mean that these structures are more likely to be error-free compared to the SLI?

Figures 7-39 and 7-40 show the mean rate of utterances that contain at least one embedded clause and at least one error (erroneous complex utterances), as well as the mean rate of utterances without an embedded clause and that also contain at least one error (erroneous simple utterances). The between-group differences did not reach significance at T1 for erroneous complex (H (2, 55) = 4.89, p = 0.086) or erroneous simple utterances (H (2, 55) = 1.95, p = 0.38). The between-group results at T2 are similar (erroneous complex utterances: H (2, 54) =.29, p = 0.86; erroneous simple utterances: H (2, 55) = 0.53, p = 0.77). The proportion of erroneous complex utterances out of all complex utterances is significantly higher than the equivalent proportion in simple utterances in both groups, as can be seen in Figure 7-39 and Figure 7-40. In other words, complex utterances are produced in a non-target fashion at a significantly higher rate than simple utterances in the SLI and the L2 at both T1 and T2 (T1: L2: Z = 4.11, p < 0.0001, SLI: Z =2.57, p <0.05; T2: L2: Z = 4.04, p < 0.0001; SLI: Z = 2.46, p < 0.05).

Figure 7-39. Rate of Erroneous Complex & Simple Utterances in the SLI, L2, and TD4 at T1.

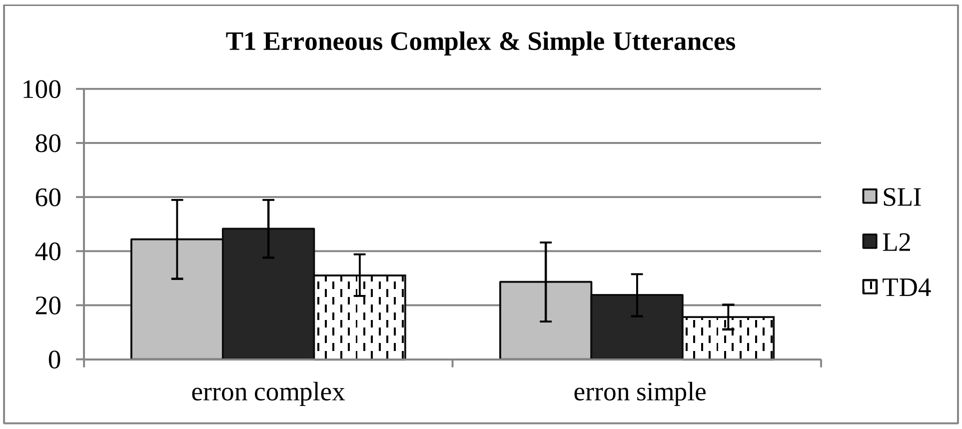
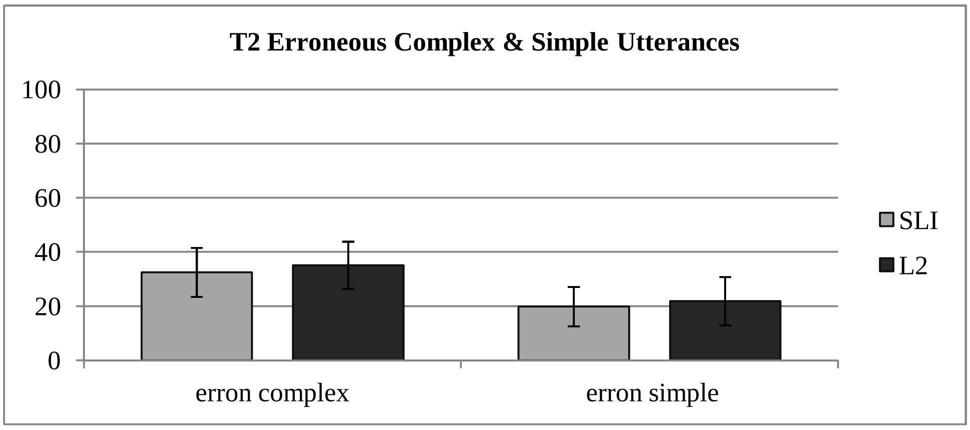


Figure 7-40. Rate of Erroneous Complex & Simple Utterances in the SLI and L2 at T2.



Concerning longitudinal progression, within-group comparisons revealed that the L2 significantly reduced their rate of erroneous complex utterances (i.e., produced significantly greater rate of targetlike complex utterances) from T1 to T2 ($Z = 2.9$, $p < 0.01$); whereas this difference did not reach significance in the SLI. In other words, the SLI did not produce a significantly higher rate of targetlike complex utterances at T2 compared to T1 ($Z = 1.19$, $p = 0.23$). The rate of erroneous simple utterances did not change significantly in either group from T1 to T2.

When looking at the different age groups in each population, slight differences can be observed in the rate of erroneous simple utterances at T2. As seen previously in Section 7.3.5, the older L2 children tended to make more overall errors than the older children with SLI. This also tends to be the case at T2 when we look at the percentage of erroneous simple utterances. The older group of children with SLI tended to have a lower rate of erroneous simple utterances compared to the older L2 children at T2, but this did not reach significance ($U = 33$, $p = 0.075$). Interestingly, the younger children with SLI tended to have higher rates of erroneous simple utterances than the younger L2 at T2 ($U = 22$, $p = 0.06$), as can be seen in Table 7.40 and Figures 7.1 and 7.42. However, there was no significant difference found between the rates of erroneous complex utterances in either group at T1 or T2. The significantly higher rate of erroneous simple utterances in the younger SLI group compared to the younger L2 group suggests that even simple utterances, which are predicted to be less demanding to produce in terms of cognitive cost, are prone to error in the younger children in SLI, whereas younger L2 children have relatively less difficulty with simple utterances. In the older groups, the opposite result is observed: The L2 children tend to produce a higher rate of simple erroneous utterances than the older children with SLI. Because errors decrease with age in the SLI group, but the same is not necessarily true for the L2 group, older L2 children tend to produce errors with higher frequency. This is evidenced by a number of significant correlations (or with a tendency towards significance) between CA and error rates in the SLI.[102] The same correlations are not significant in the L2.[103] In other words, there is very little difference in terms of error distribution between the older L2 and younger L2; however, because the error rates in the SLI decreased with age, the older L2 produced more errors

---

[102] SLI T1: CA & % Erroneous Utt: $r_s = -0.45$, $p < 0.056$; CA & % Erroneous simple: $r_s = -0.54$, $p < 0.017$; SLI T2: CA & % Erroneous Utt: $r_s = -0.83$, $p < 0.0001$; CA & % Erroneous simple: $r_s = -0.81$, $p < 0.0001$. The correlation between CA and % Erroneous complex utterances is not significant at T1 $r_s = -0.35$, $p = 0.14$) or T2 ($r_s = -0.35$, $p = 0.16$).

[103] L2 T1: CA & % Erroneous Utt: $r_s = -0.22$, $p < 0.34$; CA & % Erroneous simple: $r_s = -0.16$, p < 0.5; L2 T2: CA & % Erroneous Utt: $r_s = -0.01$, $p < 0.96$; CA & % Erroneous simple: $r_s = 0.025$, $p < 0.91$. The correlation between CA and % erroneous complex utterances is not significant either at T1 ($r_s = -0.27$, $p = 0.23$) or T2 ($r_s = -0.14$, $p = 0.55$).

compared to the older SLI and the younger L2 produced more errors compared to the younger SLI.

Table 7-40. Rate of Erroneous Complex & Simple Utterances per Age Group at T1 and T2.

Rate of Erroneous Complex and Erroneous Simple Utterances						
			SLI 6-9	**L2 6-9**	**SLI 9-12**	**L2 9-12**
T1	% Err. simple utterances	**M**	40.1	24.3	18.3	23.8
		SD	*27.7*	*14.2*	*11.1*	*19.0*
	% Err. complex utterances	**M**	54.9	52.2	35.0	46.9
		SD	*32.2*	*20.0*	*23.9*	*24.7*
T2	% Err. simple utterances	**M**	29.7	22.1	10.9	21.9
		SD	*14.9*	*20.9*	*6.5*	*16.8*
	% Err. complex utterances	**M**	38.3	35.5	27.8	34.3
		SD	*22.6*	*19.8*	*12.9*	*17.6*

Figure 7-41. Erroneous Simple and Complex Utterances in the 6-9 Age Groups at T1 and T2.

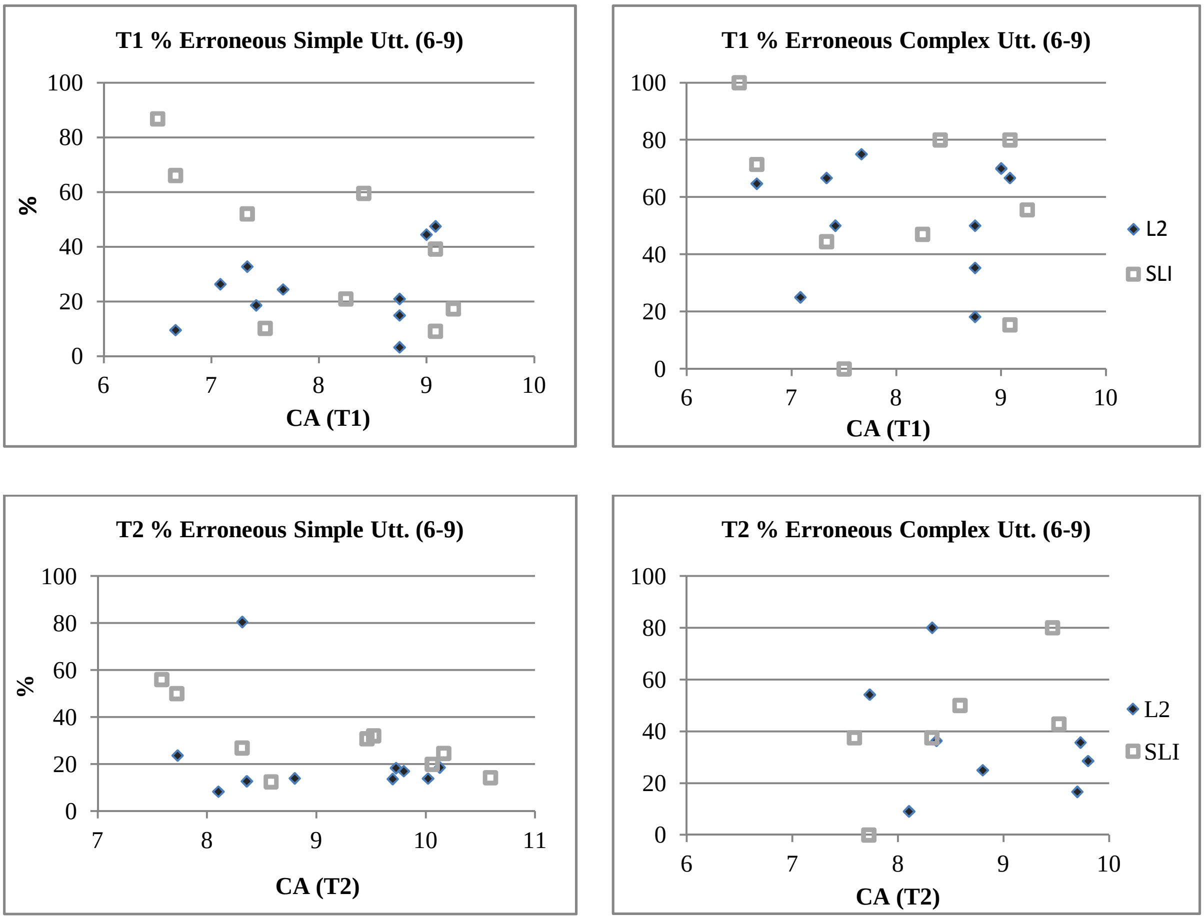
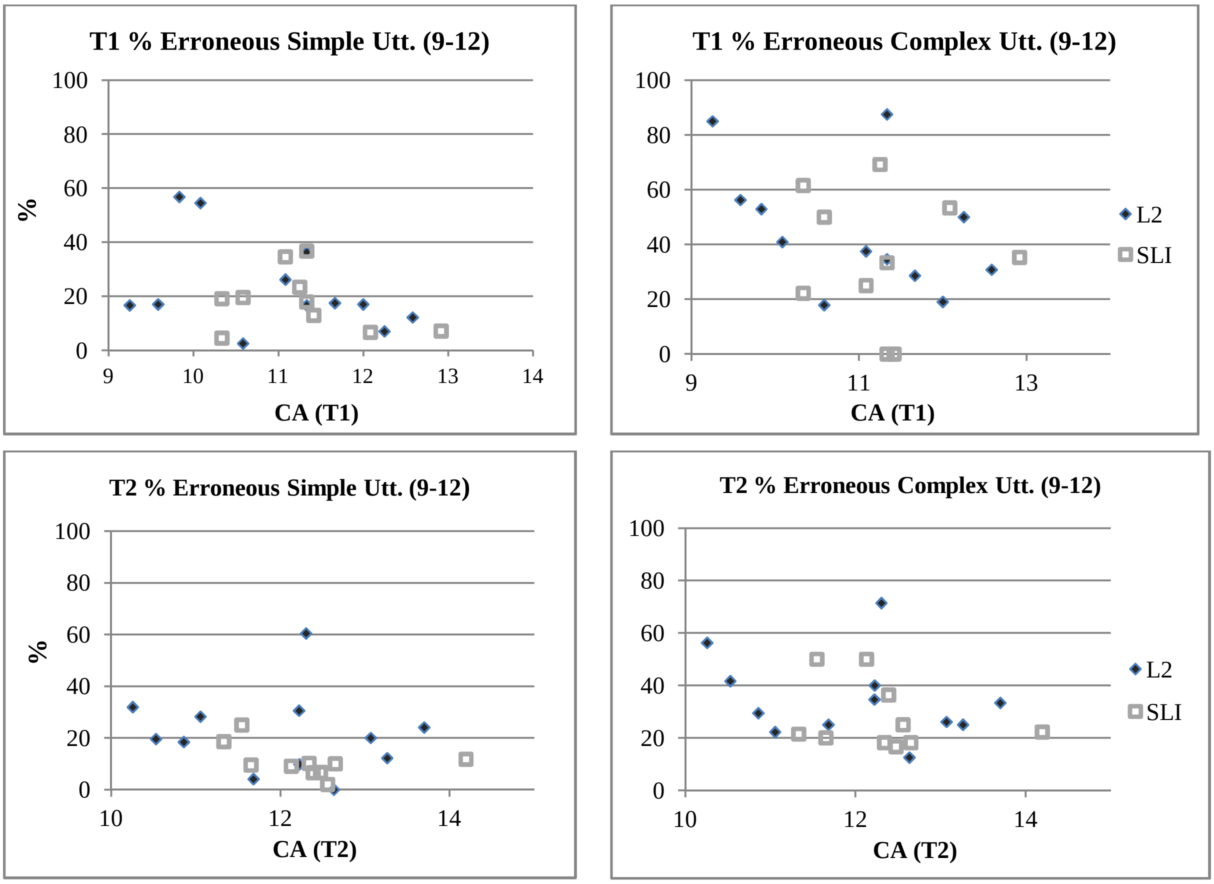


Figure 7-42. Erroneous Simple & Complex Utterances in the 9-12 Age Groups at T1 and T2.



7.3.6.2 Target relative clauses

Previous studies have shown that relative clauses are particularly error-prone in the spontaneous language of atypically-developing learners (Tuller et al. 2011; Delage 2008). Do the L2 children pattern with atypical learners in this respect?

In Figure 7.43, the raw number of relative clauses produced per child is plotted on the X axis and the raw number of target relatives is plotted on the Y axis. This scatter plot shows that there is considerable overlap across groups at T1 and at T2 for the number of target relatives (relatives produced without an error in morphosyntax). This is supported by statistical analyses which revealed no significant between-group differences at T1 or T2 (T1: U = 197, p = 0.75; T2: U = 175, p = 0.36). However, at T2, a numerically greater number of L2 children produced a higher number of target relative clauses compared to the SLI. As can be seen in Figure 7-44, only 5 children with SLI (5/19, 26%) produced at least three error-free relative clauses, whereas 9 L2 children (9/22, 40%) produced three or more target relatives. However, these proportions were not significantly different (χ^2 = 0.97, p = 0.32).

Figure 7-43. Total Relatives & Total Target Relatives in the SLI, L2, and TD4 at T1.

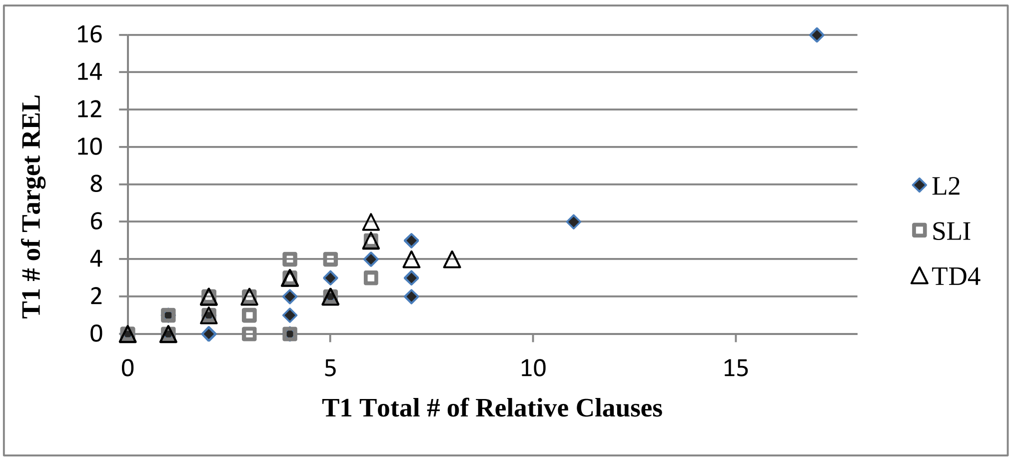
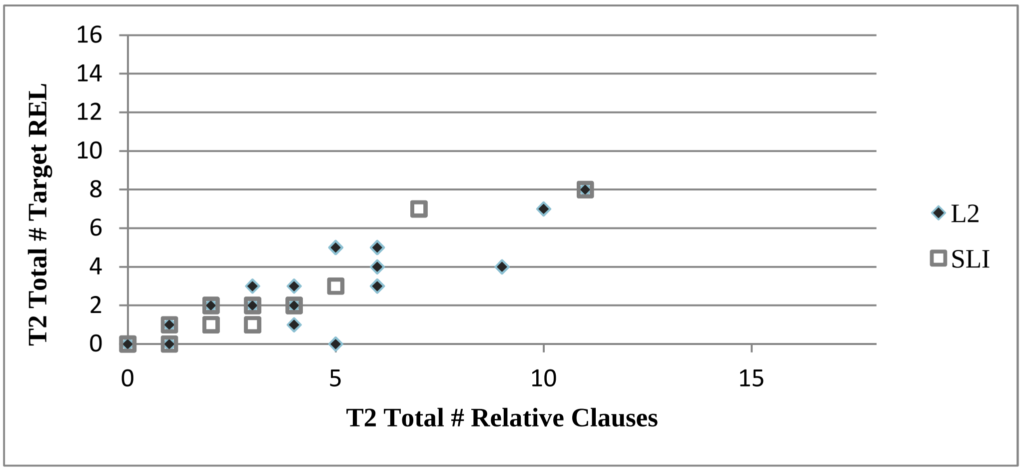


Figure 7-44. Total Relatives & Total Target Relatives in the SLI and L2 at T2.



7.3.6.3 Errors occurring in complex versus simple utterances

The results from the previous section examined the rate at which children with SLI and L2 children were able to produce targetlike complex and simple utterances. Another way of looking at the question of error distribution is to analyze the amount of errors that occur in complex utterances out of the total number of errors. In other words, what percentage of the total number of errors occurs in utterances containing an embedded clause versus simple utterances?

Concerning the overall number of morphosyntactic errors, all children had at least three errors at both T1 and T2, so all individuals were included in this analysis. In spite of the sufficient number of contexts to work with, there was incredible individual variation across and between groups. Figure 7.45 shows the mean proportion of errors in simple versus complex utterances by group at T1 and T2. Although the L2ers also tended to produce a smaller proportion of errors in simple utterances than the other groups, this difference does not reach significance at T1 or T2 (T1: H (2, 55) = 4.66, p = 0.097; T2: H (2, 55) = 1.33, p = 0.514). As a group, the SLI (at T2 only) and the TD4 made a significantly higher proportion of errors in simple utterances compared to complex (TD4: Z = 2.13, p < 0.03; SLI T1: Z = 1.63, p = 0.10; SLI T2: Z = 2.5, p = 0.013); however, this difference was not significant in the L2 (T1: Z = 1.34, p = 0.18; T2: Z = 1.29, p = 0.2). In other words, the L2 group evenly distributed errors between simple and complex utterances; whereas, the SLI and the TD4 made a larger percentage of their errors in simple utterances. This pattern holds when we look at individual results. At T1, 12 L2 children (55% of the group) made 50% or more of their errors in complex utterances; whereas, only 8 children with SLI (8 out of 19 or 42%) and 3 TD4 children (3 out of 14 or 21%) did so.

Figure 7-45. Errors occurring in simple vs. complex utterances in the SLI, L2, and TD4 at T1.

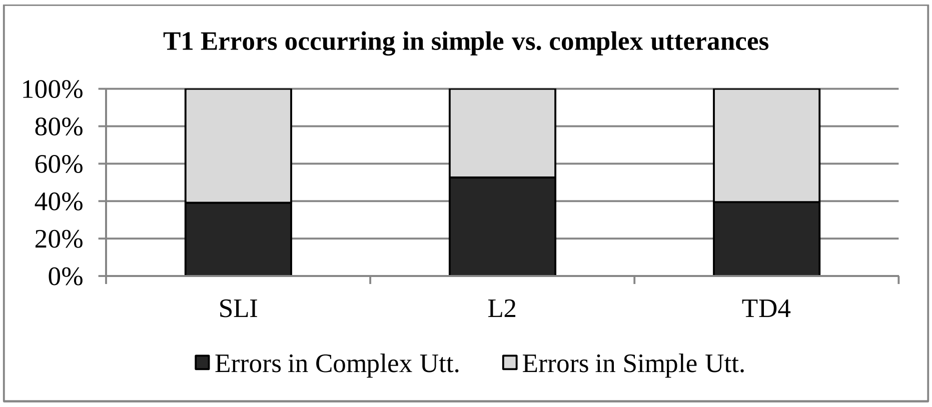
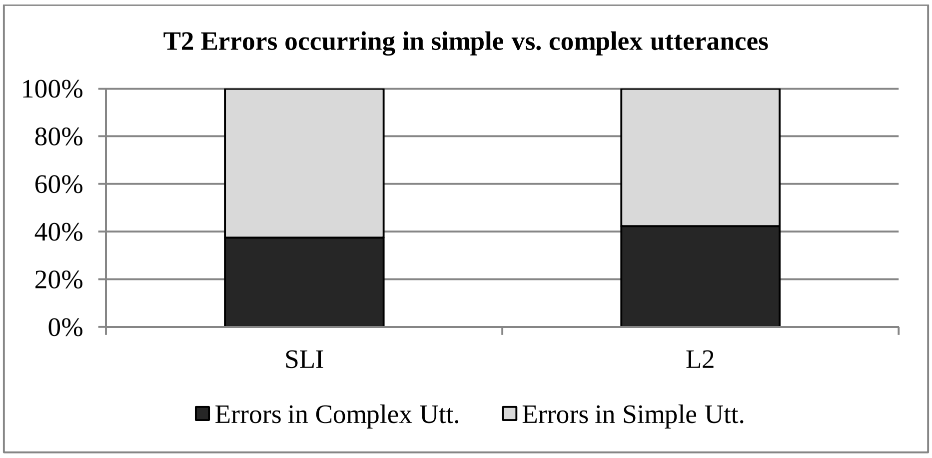


Figure 7-46. Errors occurring in simple vs. complex utterances in the SLI and L2 at T2.



7.3.6.4 Correlations between embedding and errors

What is the link between embedding and error rates? Did the children who used clausal embedding more frequently also make more errors? Did the children with higher MLUs make more errors? Does embedding or utterance length increase the likelihood of errors being made? Correlation analyses will be used to analyze the relationship between error and embedding measures in an attempt to answer these questions. The rate of erroneous utterances (i.e., the number of utterances containing at least one error out of all utterances) will be analyzed against the four measures of clausal embedding that were presented previously (rate of subordination, rate of complex utterances, clausal density, and rate of deep embedding).

A certain number of striking differences emerge from these analyses. First of all, at T1 there is no correlation between MLU and the rate of erroneous utterances in the L2 group (r_s =-0.15, p = 0.49). This contrasts sharply with the negative correlation between the same variables in the SLI group (r_s = -0.63, p < 0.01). The correlation in the TD4, on the other hand, is positive (r_s = 0.78, p < 0.001). Figures 7-47 to 7-49 show the individual results per group.

Figure 7-47. MLU & Rate of Erroneous Utterances in the L2 at T1.

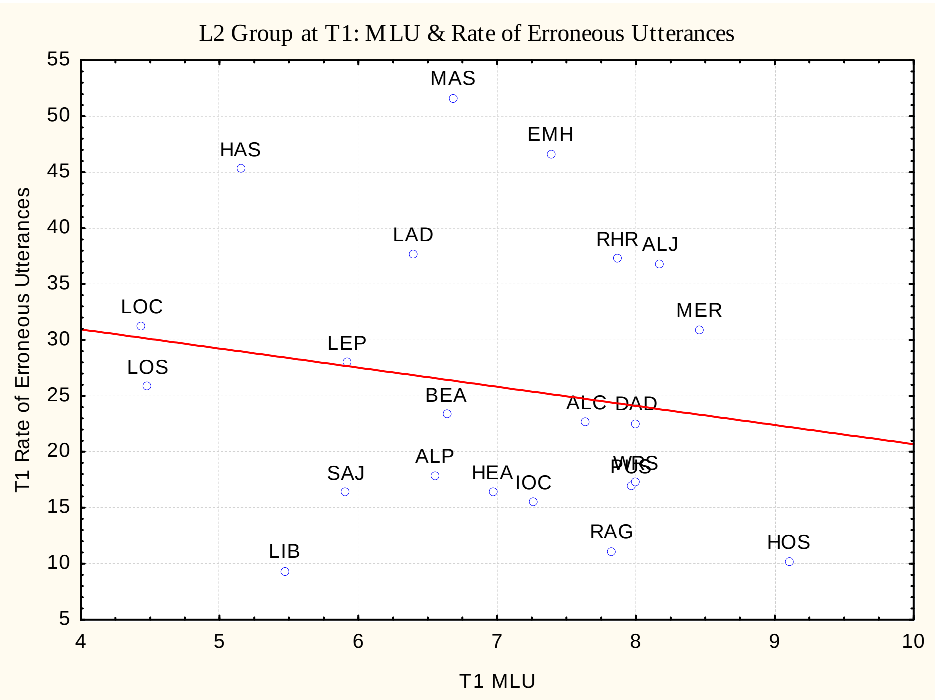


Figure 7-48. MLU & Rate of Erroneous Utterances in the SLI at T1.

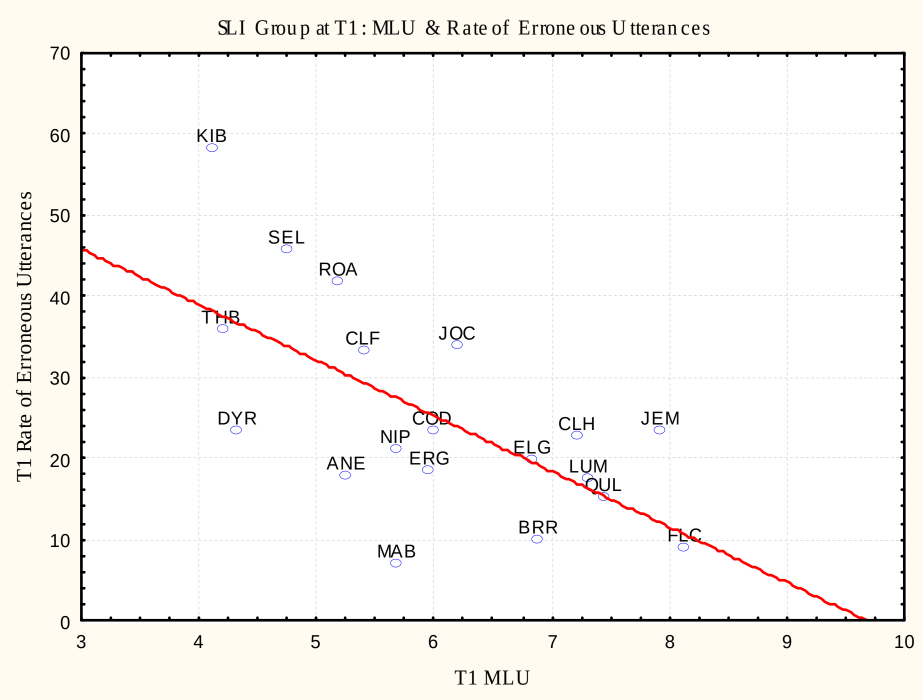
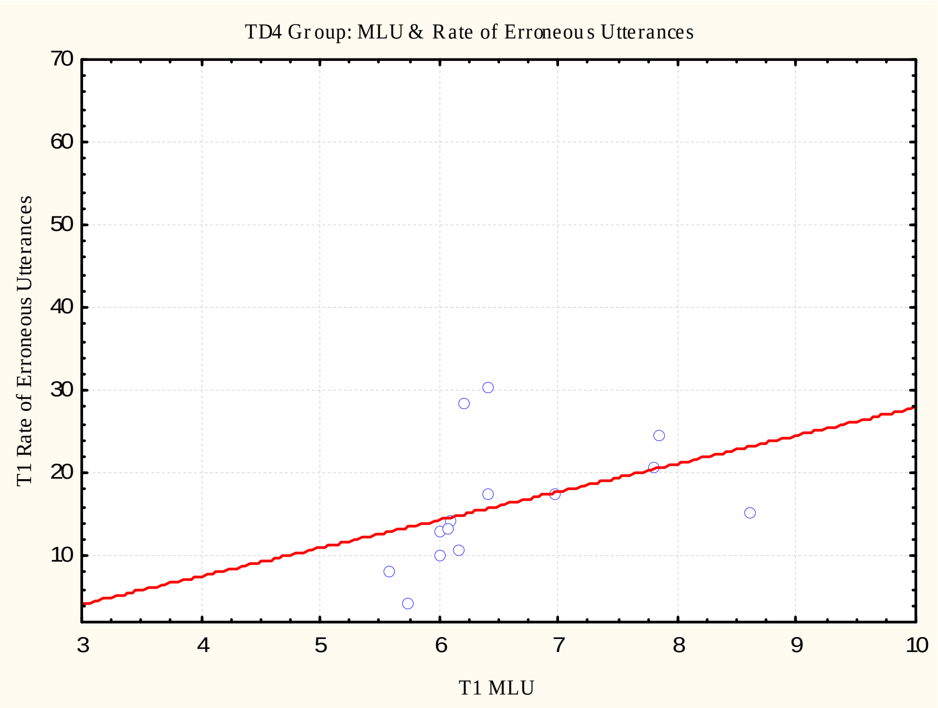


Figure 7-49. MLU & Rate of Erroneous Utterances in the TD4.



The correlation analyses at T2 for MLU and the rate of erroneous utterances differ with respect to T1. At T2, the L2 look more like the TD4 in that the correlation between MLU and errors at T2 is positive and significant, whereas there was no correlation in the L2 at T1. The SLI again displayed an inverse relation between erroneous utterances and MLU, but this is no longer significant at T2 (r_s = -0.35, p = 0.14). From this pattern of results, one could potentially argue that, in the TD4 and in the L2 group at T2, those individuals who have longer utterances tend to make more errors. However, the SLI display the opposite pattern, especially at T1. Strikingly, those children with SLI who have longer MLUs are also those who make fewer errors, despite the fact that having longer MLUs mean having more opportunities to err.

The MLU measure only takes the length of an utterance into account. Do children who use embedding more frequently tend to make more errors? What is the relation between the frequency of clausal embedding and the rate of erroneous utterances? The correlation analyses performed between the rate of erroneous utterances and clausal embedding measures revealed a pattern that was similar to the one described above between errors and MLU (see Figures 7-50 to 7-52). In the L2 group at T1, there is no correlation between the rate of erroneous utterances and clausal embedding measures.[104] In the SLI group at T1, the correlations are negative.[105] Although the only correlation to reach significance is between errors and clausal density in the SLI group, the r_s values reveal inverse associations between these variables, a pattern which is unlike what is found in the L2. There are no significant correlations between error rates and clausal embedding measures in the TD4.

[104] The statistical results for the L2 at T1 are as follows: Rate of erroneous utterances and rate of subordination (r_s = 0.10, p = 0.65), rate of erroneous utterances and rate of complex utterances (r_s = 0.09, p = 0.68), rate of erroneous utterances and clausal density (r_s = 0.09, p = 0.7), rate of erroneous utterances and rate of deep embedding (r_s = -0.28, p = 0.21).

[105] The statistical results for the SLI at T1 are as follows: Rate of erroneous utterances and rate of subordination (r_s = -0.35, p = 0.14), rate of erroneous utterances and rate of complex utterances (r_s = -0.27, p = 0.26), rate of erroneous utterances and clausal density (r_s = -0.6, p < 0.01), rate of erroneous utterances and rate of deep embedding (r_s = -0.39, p = 0.099).

Figure 7-50. Rate of Subordination and Errors in the L2 at T1.

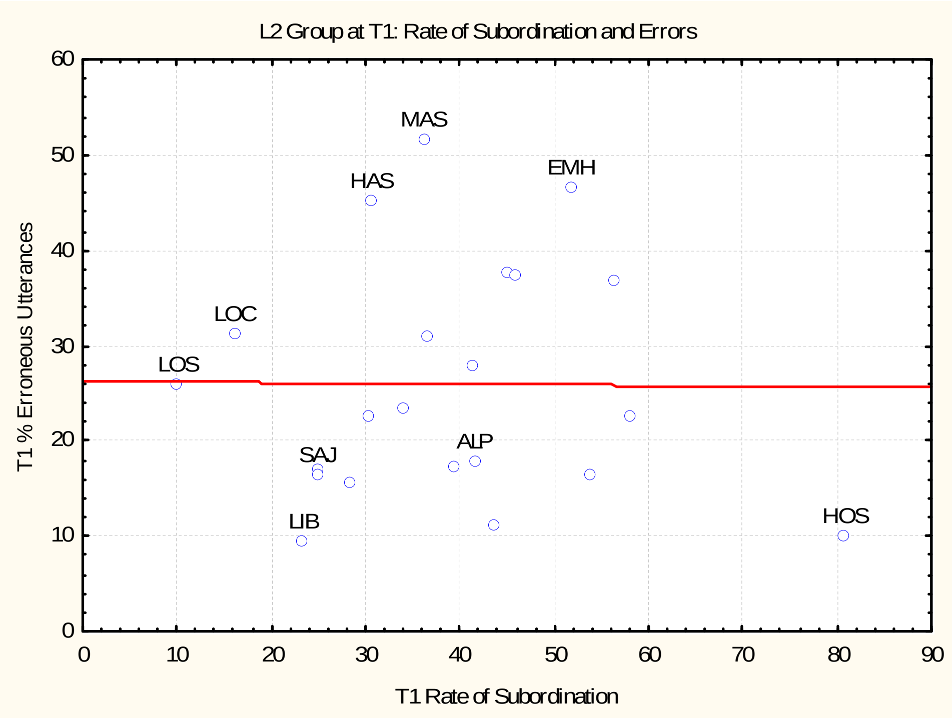


Figure 7-51. Rate of Subordination and Errors in the SLI at T1.

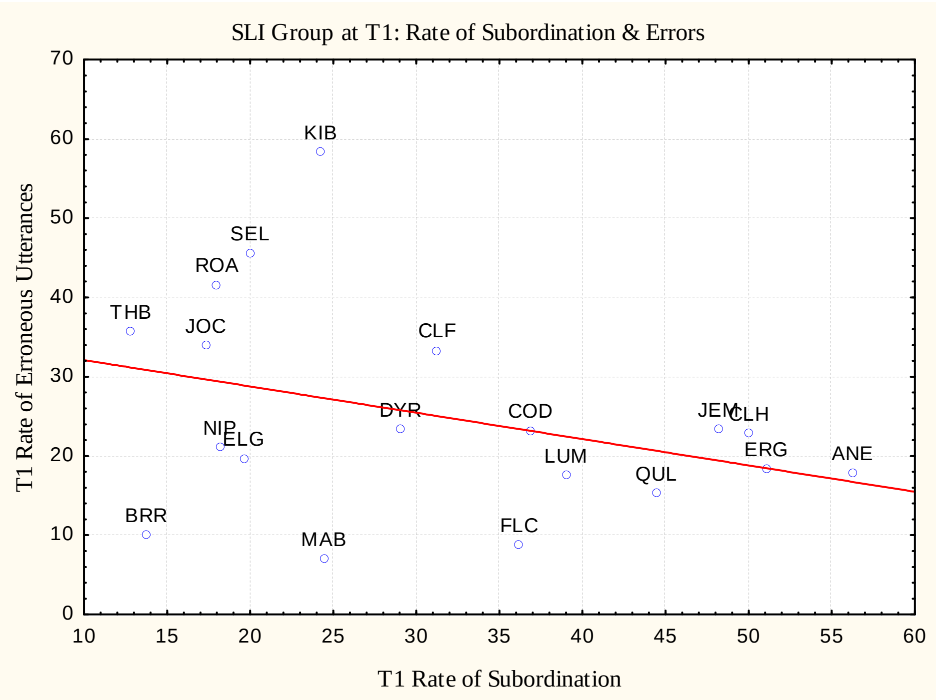
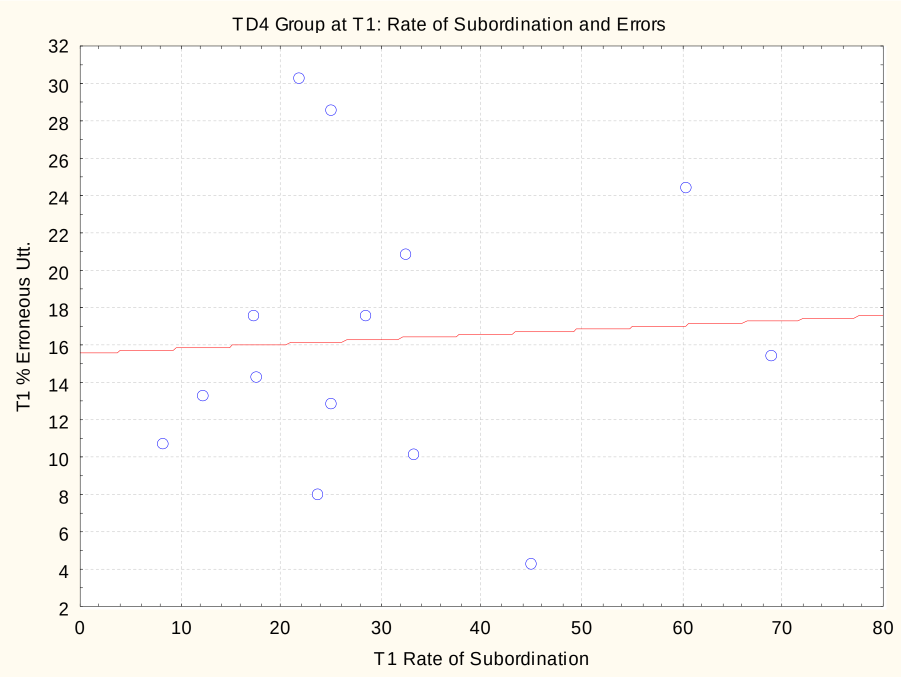


Figure 7-52. Rate of Subordination and Errors in the TD4.



In the L2 group at T2, the results are similar (i.e., there are no significant correlations between error rates and measures of clausal embedding), except for one slight tendency towards a positive correlation between errors and clausal density (r_s = 0.4, p = 0.085). On the other hand, in the SLI, the negative correlation between errors and clausal density is significant at T2 (r_s = -0.513, $p < 0.05$). There are also negative correlations between errors and the rate of subordination (r_s = -0.44, p = 0.056) and between errors and the rate of complex utterances (r_s = -0.45, p = 0.05); however, these just miss significance. Although these negative correlations are not significant, the pattern observed in the SLI is clearly different from the L2. While error rates in the L2 group tended to increase as embedding increases, error rates in the SLI tended to decrease as embedding increases.

A comparison of the L2 and SLI data plotted in Figures 7-50 and 7-51 show that there are very few L2 children with low subordination and high error rates; whereas there is a cluster of children with SLI in this category. These children with SLI tend to be the youngest out of the group. The L2 children who come closest to falling into the category of children with low rates of subordination (< 20%) and high error rates (> 25%) are LOC and LOS, who have little exposure at T1 (< 1;7). Again, although LOS and LOC's limited exposure to the L2 may explain why they have such high errors and low subordination, it is important to note that the other 4 L2ers with less than 1;7 years LoE at T1 (ALC, EMH, HAS, MAS) pattern with the rest of the L2 group. More specifically, 3 out of the 4 children with LoE of 0;11 also perform with the rest of the L2 group (EMH, HAS, MAS). As seen in Figure 7-52, there are no TD4 children with low rates of subordination (< 20%) and high error rates (> 25%); however, one TD4 child comes close with a rate of subordination at about 18% and a rate of erroneous utterances at 18%.

As can be seen in Figure 7-53, at T2, the L2 children LOC and LOS, who displayed the pattern of low subordination and high error rates, no longer show this pattern at T2. However, many of the children with SLI who displayed this pattern at T1 behave in a similar fashion at T2 (see Figure 7-54). ROA, SEL, and THB each produced error rates at 20% or higher along with subordination rates at 20% or lower. In the L2 group, ALP displayed very low rates of subordination and a high error rate. The L2 children with the highest error rates were those with the least exposure (LOS, MAS, EMH) and yet, they had rates of subordination of 30% or higher at T2.

Figure 7-53. Rate of Subordination and Errors in the L2 at T2.

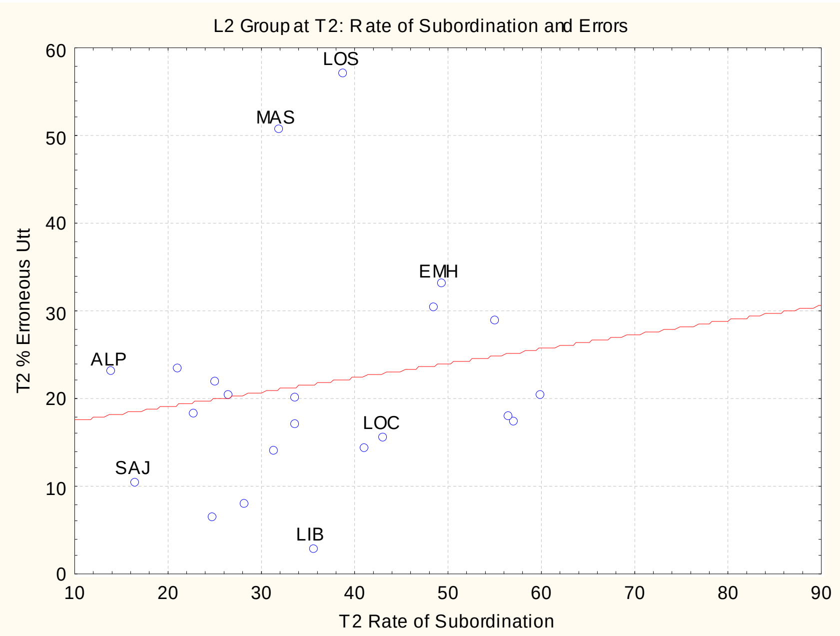
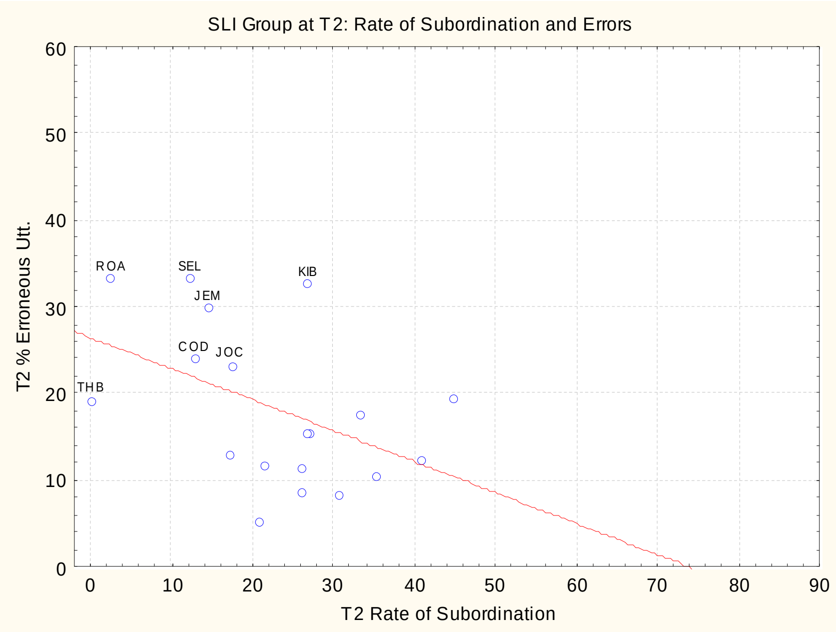


Figure 7-54. Rate of Subordination and Errors in the SLI at T2.



Summarizing, this section explored the link between the frequency of errors and clausal embedding in the L2 and SLI. These results are particularly striking. The children with SLI exhibit a profile in which clausal embedding and morphosyntactic accuracy develop together. In other words, those children (often the youngest in group) who have the highest error frequency also have the lowest frequency of embedding. As the children with SLI develop, errors become less frequent and embedding increases, although age-appropriate rates of embedding are often not reached. In stark contrast to the SLI profile, the L2 children use embedding at age-appropriate levels from relatively early on in their development. Several L2 children had high error frequency and high frequency of embedding, a pattern that was not observed in the SLI. These data reveal that there are differences in language performance in these groups, but that an approach which integrates different linguistic aspects (syntactic embedding and morphological agreement) was necessary in order to observe these differences.

7.4 L2 Factors

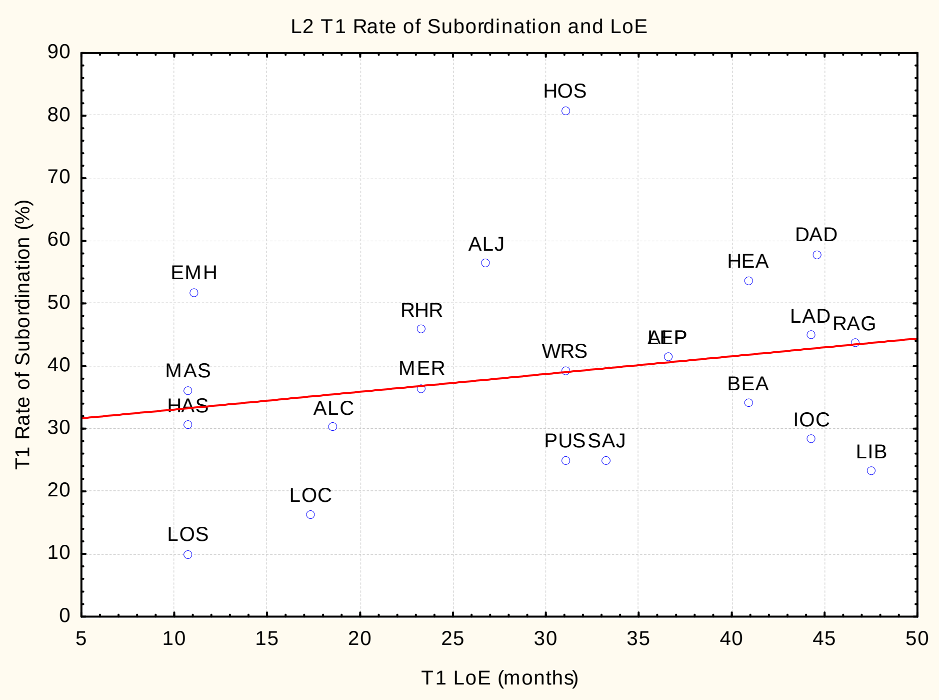
In this and the following sections, the emphasis will be shifted from the SLI-L2 comparison to an analysis based on the L2 results only. Previous research has shown that chronological age, age of onset and length of exposure are important factors in child L2 acquisition. However, little is known about how exactly these factors impact L2 developmental paths. The goal of the current section is to contribute to general understanding of how these factors contribute to overall success in L2 performance. The factor of chronological age having been analyzed in the previous section on the SLI-L2 comparison, the following sections will concentrate on age of onset and length of exposure.

7.4.1 LoE and Measures of Clausal Embedding

Recall from the methodology chapter (Section 6.2.1) that LoE was calculated from the moment the child arrived in France to the moment he/she was tested. The range in LoE varied from 11 months to 4 years at T1. LoE is not significantly correlated with chronological age or age of onset; however, the correlation with age does tend towards positive (r_s = 0.3, p = 0.18). The intuitive assumption is that performance in the L2 will be positively correlated with exposure; however, previous research has shown that this is not always the case. In this section an examination of the relationship between LoE and clausal embedding measures will be presented, followed by a look at the link between LoE and overall rates of erroneous utterances and the link between LoE and the morphosyntactic properties that were discussed earlier.

Figures 7.55 represents the general result observed in the correlation analyses between LoE and the clausal embedding measures, which is the lack of any clear association between the two. At T1, LoE does not appear to be associated at all with higher or lower frequency of clausal embedding (LoE & rate of subordination: r_s = 0.21, p = 0.36; LoE & rate of complex utterances: r_s = 0.17, p = 0.46; LoE & clausal density: r_s = 0.17, p = 0.46; LoE & rate of deep embedding: r_s = 0.18, p = 0.42). The frequency of relative clauses was not associated with LoE either (r_s = 0.087, p = 0.70).

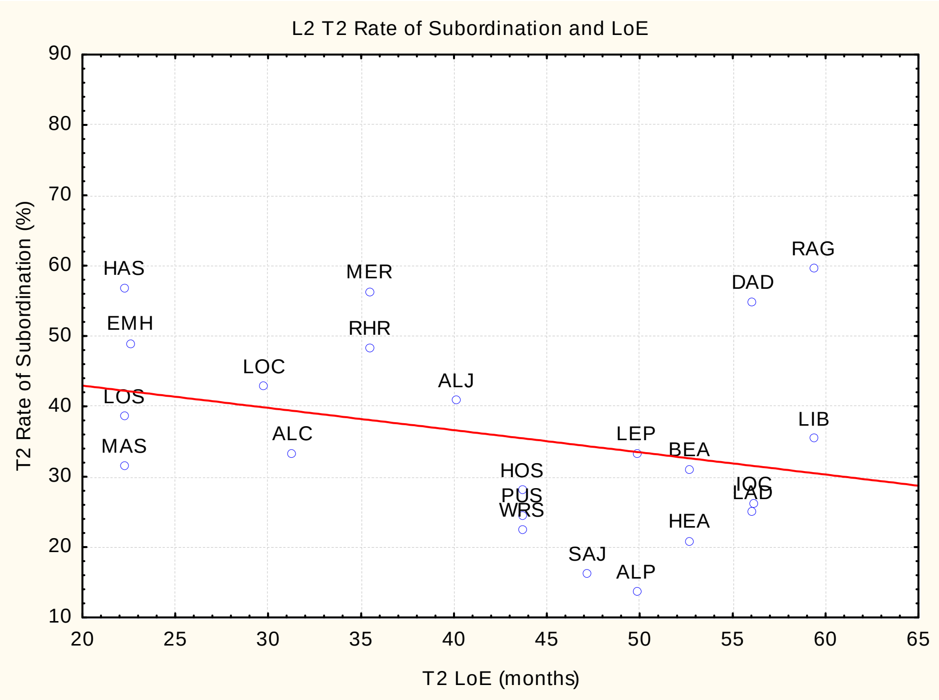
Figure 7-55. Rate of Subordination and LoE in the L2 at T1.



At T2, the analyses between LoE and the clausal embedding measures revealed a tendency towards inverse correlations;[106] however, only the correlation with the rate of deep embedding reached significance (r_s = -0.43, $p < 0.05$) (see Figure 7-56). With the exception of this significant correlation, the overall trend at T1 and T2 suggests that the majority of the L2 children in this study used clausal embedding frequently, regardless of their LoE. The lack of progression over T1 and T2 also supports this conclusion. As shown earlier, only LOC and LOS, two out of the 6 L2 children with a LoE of less than about 1;7, had clausal embedding measures that fell below -2 *SD* of the TD8+11 mean. At T2, these two individuals patterned with the rest of the L2 group and with the age controls. It is also interesting to note that the other four L2 children with little exposure at T1 had performances which were similar to the rest of the L2 group and with the age controls.

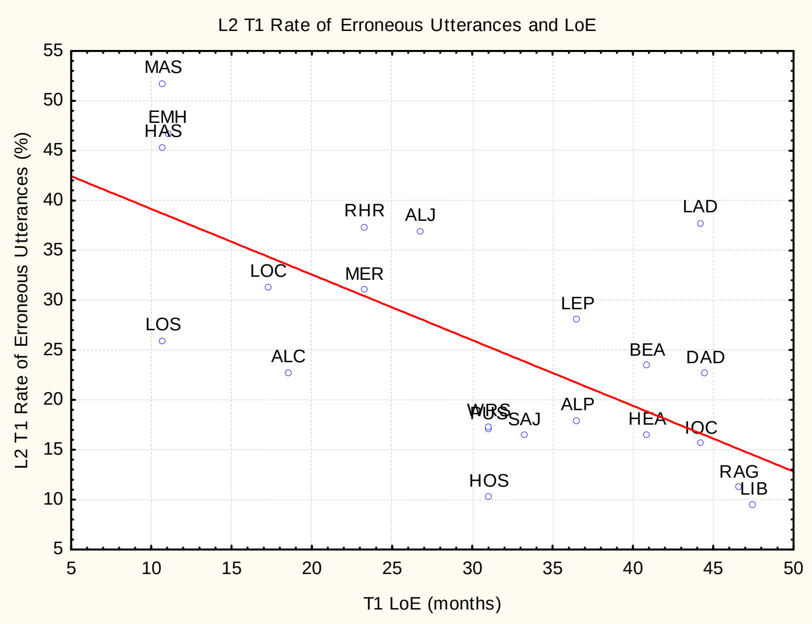
[106] L2 results at T2: LoE & rate of subordination: r_s = -0.28, p = 0.21; LoE & rate of complex utterance: r_s = -0.11, p = 0.61; LoE & clausal density: r_s = -0.36, p = 0.099; LoE & rate of deep embedding: r_s = -0.43, p < 0.05).

Figure 7-56. Rate of Subordination and LoE in the L2 at T2.



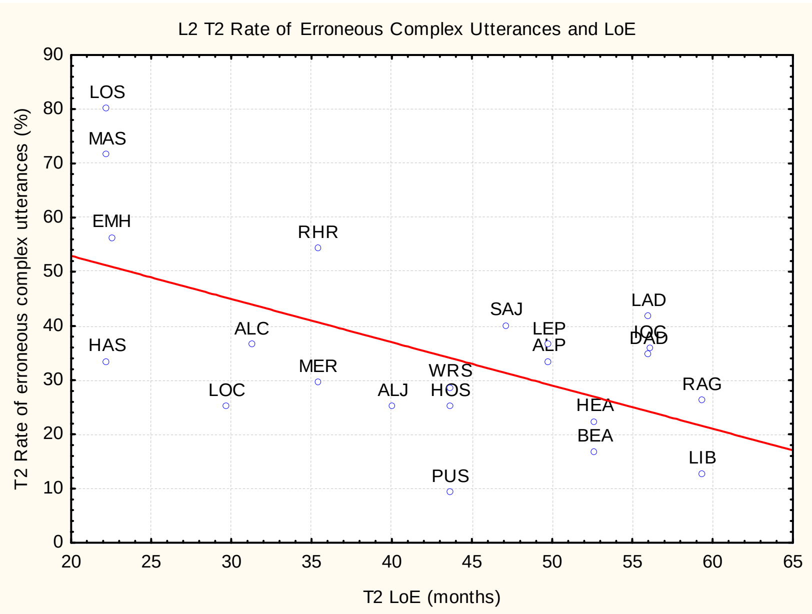
Although these data show no consistent impact of LoE on clausal embedding, LoE appears to play a prominent role in the target production of morphosyntax. Looking first at the rate of erroneous utterances in Figure 7-57, there is a significant negative correlation observed with LoE at T1 (r_s = -0.66, $p < 0.001$). Significant negative correlations were also found between LoE and the rate of erroneous complex utterances at T1 (r_s = -0.64, $p < 0.01$) and the rate of erroneous simple utterances at T1 (r_s = -0.55, $p < 0.01$). Although the proportion of relative clauses out of all subordinate clauses did not correlate with LoE, the percentage of *error-free* relative clauses correlated positively and significantly with LoE (r_s = 0.75, $p < 0.01$).

Figure 7-57. Rate of Erroneous Utterances and LoE in the L2 at T1.



At T2, the correlations between LoE and morphosyntactic accuracy are no longer significant. However, there are some very strong tendencies, including the correlation between LoE and the rate of erroneous complex utterances (see Figure 7-58) (r_s = -0.40, p = 0.062) and the rate of *error-free* relative clauses (r_s = 0.5, p = 0.055). Therefore, the impact of LoE on morphosyntactic accuracy appears to have decreased over the 12-month interval.

Figure 7-58. Rate of Erroneous Complex Utterances and LoE in the L2 at T2.

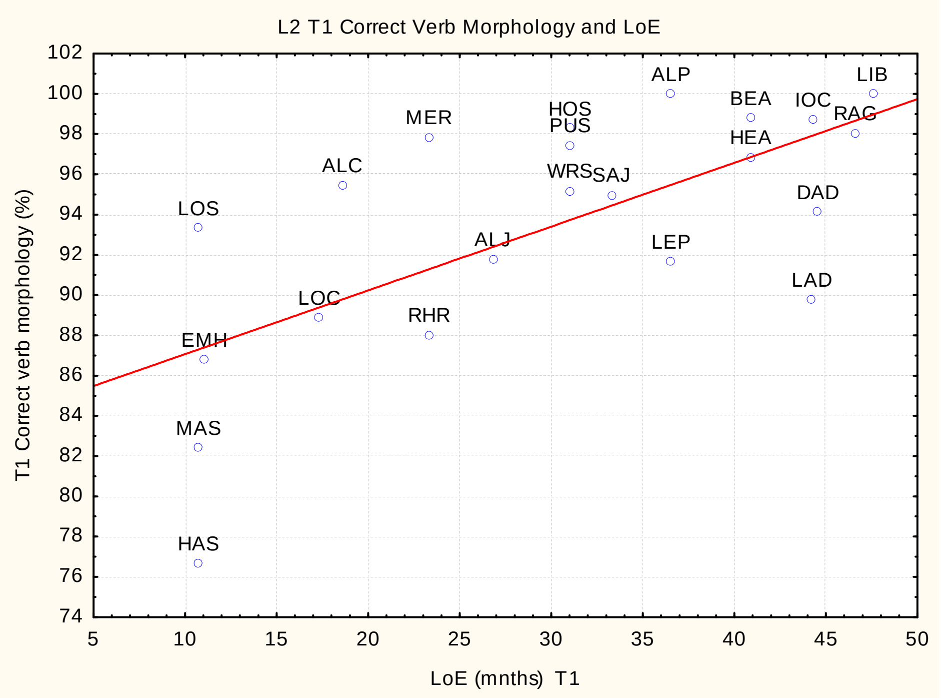


7.4.2 LoE and morphosyntactic properties

Given the above significant correlations with overall error rates, it is perhaps unsurprising that a certain number of morphosyntactic properties also correlate significantly with LoE. As the above analyses also showed, these correlations are significant only at T1.

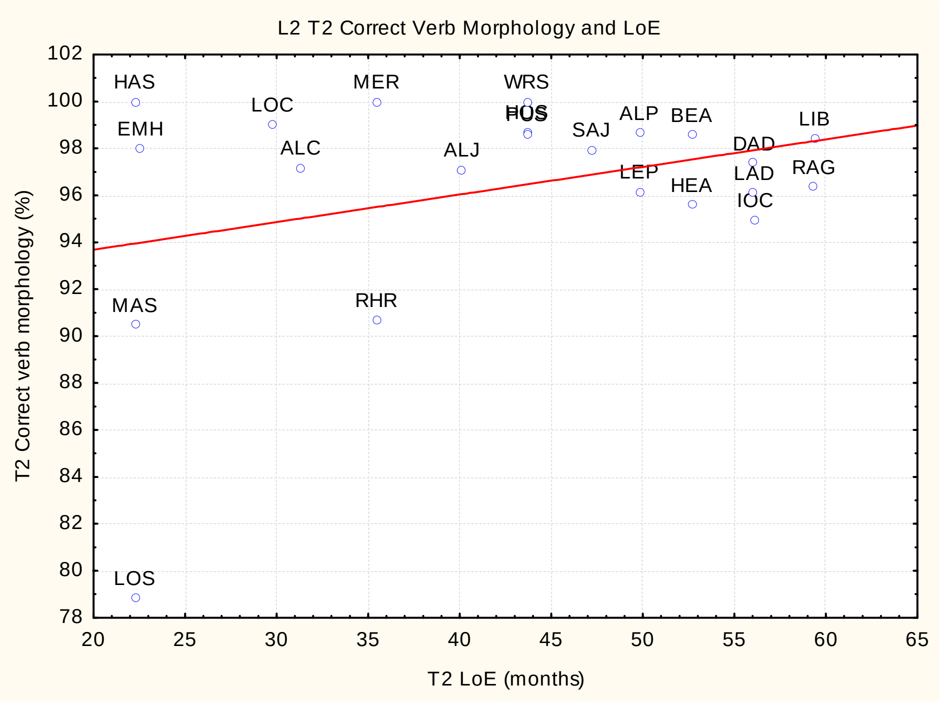
In the L2 group at T1, there is a significant correlation between LoE and overall accuracy in verb morphology (r_s = 0.638, p < 0.01). There are also significant positive correlations between LoE and more specific measures of verb morphology, such as the rate of correct non-present verbs (r_s = 0.46, p < 0.05). Figures 7-59 shows that the L2 children with the lowest exposure, such as EMH, MAS, and HAS do in fact have the lowest accuracy for verb morphology at T1.

Figure 7-59. Correct Verb Morphology and LoE in the L2 at T1.



At T2 the link between verb morphology and LoE is weaker. There are no significant correlations between these variables, but there is a tendency between LoE and correct finiteness (r_s = 0.42, p = 0.052). However, there is no longer a significant correlation at T2 between LoE and correct verb morphology as demonstrated in Figure 7-60 (r_s = -0.095; p = 0.67). Although certain children, such as LOS, have the lowest overall rate of target verb morphology and are among those with least amount of exposure (0;11), the majority of the L2 children have very high performance for verb morphology and therefore the correlation is not significant.

Figure 7-60. Correct Verb Morphology and LoE in the L2 at T2.



Looking at the production of object clitics, a similar link with LoE was observed. At T1, there is a significant positive correlation between the rate of object clitic production (including all clitic types) and LoE ($r_s = 0.56$, $p < 0.01$) (see Figure 7-61). Again, this correlation is no longer significant at T2 ($r_s = 0.17$, $p = 0.44$), given that a large majority of L2 children produced object clitics with greater than 75% accuracy (see Figure 7-62).

Figure 7-61. Object Clitics Produced and LoE in the L2 at T1.

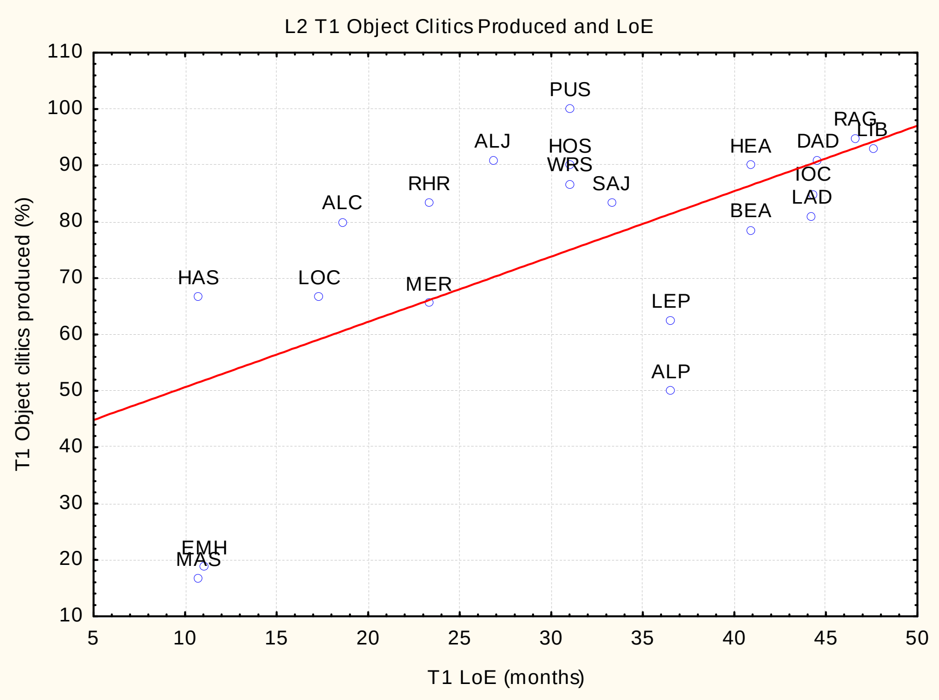
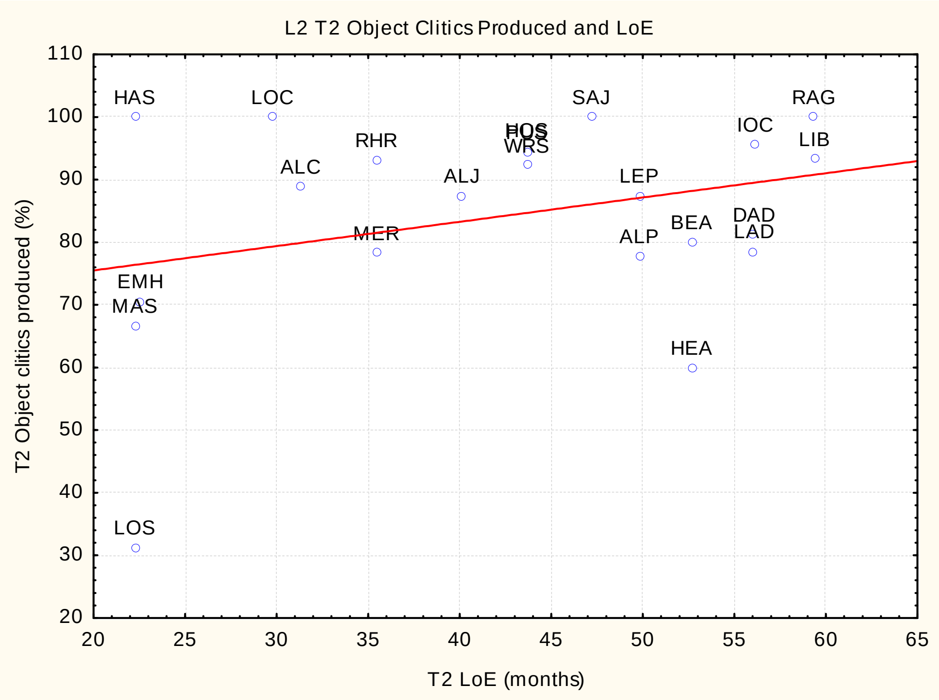


Figure 7-62. Object Clitics Produced and LoE in the L2 at T2.



Strikingly, correct gender production does not follow the patterns that have just been described for verb morphology and object clitics. There are no significant correlations between rates of overall gender accuracy at T1 or T2 (T1: $r_s = 0.22$, $p = 0.32$; T2: $r_s = 0.36$, $p = 0.099$). Although children with little exposure at T1 have the numerically lowest rates of target gender agreement, children with longer exposure do not necessarily outperform those with less exposure. For example, the child DAD, who has 56 months of exposure at T2 as well as very high performance on all standardized tests and for clausal embedding measures, produced gender agreement at one of the lowest rates: 84% (67 correct out of 79 obligatory contexts).

7.4.3 Age of Onset

Recall that age of onset (AoO) was the age at which the child arrived in France. The range in AoO varied from 4;0-10;0 (*M* = 7;0; *SD* = 1;0). As explained in methodology chapter, because of the age ranges that were targeted in the recruitment process, AoO and chronological age are significantly correlated ($r_s = 0.82$, $p < 0.0001$) in the L2 populations. In other words, only two of the younger group of L2 children have an age of acquisition that is above 7;6. Therefore, the chronological age and age of onset are confounding variables in this study. Although this situation may prevent any strong conclusions about the age of onset, an attempt will be made to analyze how age of onset may have impacted the L2 performances described here. As described in Chapter 2, the interest in the age of onset stems from the critical period hypothesis for language acquisition. Simply put, this hypothesis states that that ultimate attainment in L2 acquisition depends on the age at which the learner is first exposed to the L2. Different studies have reached slightly different conclusions about the upper age boundary of the critical period, but many researchers agree that important changes occur sometime between 6 and 8 years old. Because of AoO distribution of the L2 population at hand, any child whose AoO was before 7;6 was considered to have an age of onset within the critical period. Following the critical period hypothesis, children with younger AoO should be more successful in their L2 development compared to children with later AoO. This section explores the question of whether AoO is correlated with any of the measures described in this chapter.

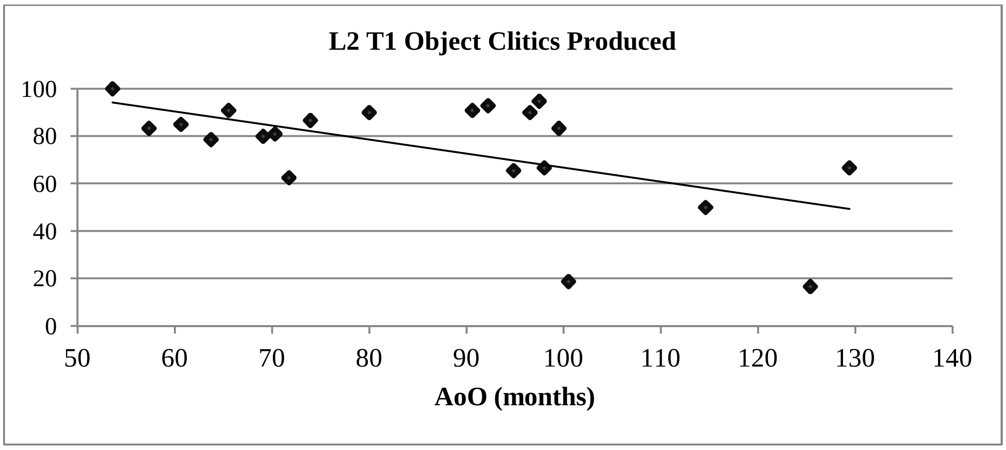
7.4.4 Age of Onset and Clausal Embedding Measures

A remarkable observation that can be made about the factor of age of onset is the lack of significant correlations with any of the clausal embedding measures analyzed here. The only correlation that comes close to significance is a positive association between AoO and the raw number of relative clauses at T2 ($r_s = 0.39$, $p = 0.069$) (this same correlation is far from significant at T1).[107] In other words, the later the age of onset, the more raw number of relative clauses tended to be produced at T2. However, the correlation between chronological age and the raw number of relative clauses also tends towards significance (r_s= 0.39, p = 0.066). Since relative clauses were shown to increase with chronological age in both the L2 and SLI groups (see Section 7.3.3), it would make more sense to think that this correlation has more to do with chronological age than age of onset.

7.4.5 Age of Onset and Morphosyntactic Properties

Although only a few significant correlations were found between AoO and the morphosyntactic properties studied here, these correlations stand out as being particularly interesting. First of all, as can be seen in Figure 7-63, a negative and significant correlation was found at T1 between AoO and the rate of object clitic production (r_s= -0.45, p = 0.038). This correlation was no longer significant at T2. I would argue that this correlation is meaningful with respect to these two variables because the correlation is negative. The production of object clitics has been shown to increase with age in TD populations (e.g., Zesiger et al. 2010). Therefore, the older children should be advantaged by their age; whereas the younger children should be disadvantaged. Yet, the younger L2ers tended to produce object clitics with more accuracy than the older L2 children, despite having similar LoE.[108] This suggests that AoO is linked to the rate of object clitic production in this group of L2 children.

Figure 7-63. Object Clitics and AoO at T1 in the L2 Group.



[107] Number of Relative clauses and AoO at T1 : r_s= 0.087, p = 0.70
[108] Recall that there is no significant correlation between CA and LoE.

7.4.6 L1 Skills

As discussed in the section on standardized tests, the L2 group's performance in English (CELF scores) was correlated with the French word repetition and sentence completion scores at T1. Did performance in the L1 correlate with any of the spontaneous measures analyzed in the previous sections?

Very few of the CELF scores correlated significantly with the clausal embedding or morphosyntactic measures that were analyzed previously. The Recalling Sentences z-score did not correlate with any of the measures related to clausal embedding or the rate of erroneous utterances. This result seems to indicate that the frequency of clausal embedding or errors in spontaneous language in the L2 is not related to the ability to repeat sentences of increasing complexity in the L1.

7.4.7 Working Memory

As discussed previously, digit span scores in English were correlated with certain standardized measures in both French (word repetition) and English (CELF). Did working memory, as measured by the digit span task from the WISC-IV, appear to play a role in the spontaneous language measures (embedding or errors)? Very few significant correlations were observed between the digit span scores in French or English and measures involving embedding or errors in French. The proportion of relative clauses out of all subordinate clauses in spontaneous language was significantly correlated with the DS-E z-score at T2[109] (r_s = 0.43, $p < 0.05$), suggesting that relative clause production is linked to working memory. However, the overall lack of correlations between digit span scores (in French or English) and clausal embedding frequency in spontaneous language in French indicates that the use of embedding in general was not linked to working memory, as measured by digit span scores.

Summarizing, the major result to emerge from the analysis of factors in L2 development and spontaneous language performance is that LoE is linked to morphosyntactic accuracy, as measured by overall rates of erroneous utterances and by rates of accuracy for specific properties (verb morphology and object clitic production). However, LoE is not associated with the frequency of clausal embedding. This finding echoes results from previous work showing a dissociation between morphology and syntax in L2 (child and adult) acquisition (e.g., Schwartz 2004). LoE appeared to be the only factor associated with language

[109] Recall that the digit span score was administered at T2 only.

performance. AoO, L1 skills and working memory were generally not correlated with spontaneous language measures, with the notable exception of object clitic production

7.5 Interpretation of Clausal Embedding in Light of Measures Standardized Tests

The literature on the direct comparison of children with SLI to L2 children has revealed an overlap in morphosyntactic performance in these two different learner groups. This documented overlap, in addition to insufficient knowledge about L2 developmental trajectories, increases the risk of L2 children being either mistaken for SLI or having their language difficulties attributed to their L2 situation. This section addresses the question of whether measures of clausal embedding can be helpful in deciding whether L2 children are following a healthy L2 developmental path or whether they should be considered for language impairment. **In other words, can the analysis of measures such as rate of subordination and rate of erroneous utterances, as well as the comparison with children with SLI, contribute to the delineation of healthy and impaired child L2 developmental trajectories?** In Section 5.4.3, the prediction was made that those L2 children who produce clausal embedding at the same rate as the SLI should be considered for language impairment. This prediction will also be addressed in this section.

The results presented in this chapter showed that many of the L2 children scored below the cutoff for their age in the sentence completion task in French. This was the case even for those L2 children who had had at least three years of exposure to the L2. A number of L2 children also scored below normal for their age level in their L1. Because language impairment is expected to affect both languages, weak scores in both French and English could be considered a sign of atypical development. However, as was pointed out in the literature review, standardized assessments are rarely adapted for L2 children and may make it very difficult for these learners to obtain scores within the norm for their age in their L1 or in their L2. Therefore, the standardized test scores will be interpreted with much caution. Nonetheless, these standardized assessments give us an idea as to how the L2 child performs with respect to monolingual children of the same age and with respect to their L2 peers and their peers with SLI. **In this section, spontaneous language measures and standardized test scores at T1 and T2 will be compared to see if the frequency of clausal embedding reinforces or contradicts the results on the standardized assessments.** In addition, overall profile trends will be examined to address the question of possible healthy developmental paths in the L2 population. In other words, are there certain individuals in the L2 group that have low rates of clausal embedding when compared to other L2ers? Is there other evidence showing that L2 children with low rates of embedding should be considered atypical L2 learners?

Table 7-41 shows z-scores for the L2 group at T1 for standardized test scores, measures of clausal embedding, and the rate of erroneous utterances. The z-scores for clausal embedding and error measures[110] were calculated based on the mean and standard deviation of the L2 group. The standardized test z-scores were calculated from the norm-referencing population for the particular task. The grey cells signal scores that are below -1 *SD*. Looking at these T1 results, an initial, general observation is that most of the L2 children are within -1 *SD* of the L2 group for clausal embedding and error measures. Those with atypical standardized test scores generally perform with the rest of the L2 group for clausal embedding as well as errors. However, the children LOS and LOC have scores which fall outside of -1 *SD* of the L2 mean for at least 3 out of 4 clausal embedding measures. It was hypothesized in previous sections that their low performance is due to their limited LoE. However, it was also pointed out that other L2ers with limited LoE (ALC, EMH, HAS, MAS) do not display the same pattern. LIB, who has relatively long LoE, is also below -1 *SD* for 2 out of 4 clausal embedding measures. LOC and LOS also have low scores for sentence completion and word repetition in French, but have normal scores for the CELF-CLS. LIB also has normal CELF-CLS as well as normal scores for the sentence completion task in French. These standardized test scores in the norm suggest that these children are not acquiring their L2 atypically, but that the clausal embedding measures somehow underestimated their language capabilities.

[110] Error rates were calculated based on the number of target-like utterances (i.e., utterances without any errors). Therefore, children with negative z-scores for errors tended to make more errors, whereas children with positive z-scores tended to make fewer when compared to the other L2ers.

Table 7-41. Comparison of Standardized Test Scores and Clausal Embedding Measures per L2 Child at T1.

Z-Scores at T1 (grey cells indicate scores below age norms for standardized test scores and below -1 *SD* of the L2 mean for clausal embedding measures and errors)												
Child	Age	AoO	LoE	Sent. Comp.	Word Rep.	CELF - CLS	Rate of Sub.	Complex utt.	Clausal density	Deep embedding	Errors
RHR	6;9	4;9	1;11	-0.1	-0.1	-1.3	0.45	0.48	0.72	-0.52	-0.92
PUS	7;1	4;6	2;7	-1.0	-1.47	-3.2	-0.87	-0.48	-0.42	-1.59	0.73
ALC	7;4	5;9	1;7	0.2	0.6	0.4	-0.54	-0.64	-0.57	1.14	0.27
LOS	7;4	6;6	0;11	-2.9	-1.0	0.6	-1.83	-2.10	-1.93	1.37	0.01
ALJ	7;8	5;6	2;3	-1.7	-2.2	0.8	1.12	0.99	1.45	1.10	-0.88
BEA	8;9	5;4	3;5	-6.0	-4.8	-0.6	-0.30	-0.43	-0.26	-0.11	0.21
IOC	8;9	5;1	3;8	-2.7	-1.5	-1.5	-0.66	-0.88	-0.72	0.77	0.85
WRS	8;9	6;2	2;7	-3.9	-4.0	-1.9	0.03	0.01	-0.03	0.56	0.71
LEP	9;0	6;0	3;1	-6.0	-4.8	-1.2	0.17	0.39	-0.21	0.38	-0.17
HAS	9;1	8;2	0;11	-8.1	-8.2	-1.2	-0.52	-0.48	-0.50	-1.59	-1.57
EMH	9;4	8;4	0;11	-8.1	-3.2	-1.1	0.83	0.63	1.17	0.52	-1.68
LAD	9;7	5;10	3;8	-3.5	-0.2	0.5	0.39	0.22	0.43	0.56	-0.95
MER	9;10	7;11	1;11	-2.5	-1.9	-1.0	-0.14	0.23	0.16	-1.59	-0.40
HEA	10;1	6;8	3;5	-2.2	-4.7	-0.7	0.95	0.97	0.77	1.26	0.78
HOS	10;8	8;1	2;7	0.6	-1.6	0.5	2.67	2.17	2.15	0.94	1.28
SAJ	11;1	8;4	2;9	-3.8	-5.3	-3.1	-0.87	-1.11	-0.98	-0.52	0.78
DAD	11;3	7;7	3;9	0.8	-0.2	0.5	1.22	1.42	0.98	-0.16	0.27
MAS	11;4	10;5	0;11	-3.2	-2.8	0.1	-0.16	0.35	-0.38	-0.90	-2.08
LIB	11;8	7;8	4;0	-0.5	-1.2	0.1	-0.98	-1.29	-1.20	0.77	1.34
RAG	12;0	8;2	3;11	1.3	-0.2	0.6	0.31	0.73	0.51	-0.61	1.20
LOC	12;3	10;9	1;5	-4.3	-3.7	0.8	-1.43	-1.29	-1.59	-1.59	-0.43
ALP	12;7	9;7	3;1	-4.9	-0.9	-1.2	0.17	0.13	0.46	-0.20	0.66
M	**9;8**	**7;0**	**2;6**	**-2.83**	**-2.42**	**-0.58**					
SD	*1;9*	*1;0*	*1;1*	*2.71*	*2.19*	*1.19*					

Table 7-42 reveals the results at T2. Again, clausal embedding and error measures are calculated based on the L2 group mean and standard deviation at T2. The standardized test results are again calculated using the norm-referencing population for each test. The overall result is the same as at T1: most children are within -1 *SD* of the L2 mean for clausal embedding and error measures. However, the results at T2 show that different children have low rates of embedding compared to those who were identified at T1. LOS, LIB, and LOC each had scores within -1 *SD* at T2. The child HEA also had low clausal embedding scores, whereas his other scores are within the norm (T1 and T2 included). Given the fact that HEA, LIB, LOC and LOS each had at least one standardized test score in the norm and that they patterned with the other L2ers at T2, one would be less likely to suspect that these individuals are atypical. It may be that these learners adopted strategies at T1 or that personality traits such as shyness factored into their spontaneous language performance at T1. This variability in the spontaneous language measures will be revisited in the discussion.

On the other hand, the performance of ALP and SAJ at T2 is particularly striking. Although ALP has somewhat normal performance for embedding measures at T1, his performance at T2 is very low on both standardized test scores and clausal embedding. His standardized test scores were also very low at T1. The same is true of SAJ, except that her scores at T1 are even weaker than ALP's, especially for the CELF-CLS. Throughout the results presented in this chapter, these two learners have been consistently signaled out as being low performers on standardized tests and embedding measures. A limited LoE cannot explain their results, as they have longer LoE compared to most of the L2 group (> 2;6 at T1). Interestingly, ALP and SAJ's z-scores for error rates show that these learners made relatively fewer errors in morphosyntax compared to the rest of the group.

Table 7-42. Comparison of Standardized Test Scores and Clausal Embedding Measures per L2 Child at T2.

Z-Scores at T2 (grey cells indicate scores below age norms for standardized test scores and below -1 *SD* of the L2 mean for clausal embedding measures and errors)											
Child	Age	AoO	LoE	Sent. Comp.	Word Rep.	CELF - CLS	Rate of Sub.	Complex utt.	Clausal density	Deep embedding	Errors
RHR	7;9	4;9	2;11	-0.4	0.9	-0.9	0.91	1.51	0.85	0.13	-0.70
PUS	8;1	4;6	3;8	-0.7	-1.2	-2.8	-0.83	-0.76	-0.70	-0.98	1.16
ALC	8;4	5;9	2;7	-0.4	-0.1	0.1	-0.19	0.12	-0.33	-0.09	0.35
LOS	8;4	6;6	1;10	-0.4	-1.2	-0.3	0.20	-0.10	0.41	1.29	-2.78
ALJ	8;10	5;6	3;4	-2.7	-0.7	0.1	0.37	0.01	0.22	0.71	0.56
BEA	9;8	5;4	4;5	-3.1	-0.8	-0.4	-0.35	-0.06	-0.50	-0.21	0.58
IOC	9;9	5;1	4;8	0.4	-0.8	-0.5	-0.71	-0.50	-0.37	-1.87	0.08
WRS	9;10	6;2	3;8	0.4	-1.3	-1.0	-0.98	-1.15	-0.83	0.71	0.25
LEP	10;2	6;0	4;2	-3.8	-0.2	-1.5	-0.19	-0.12	-0.21	0.61	0.10
HAS	10;0	8;2	1;10	-4.4	-1.9	-1.2	1.53	1.65	1.23	0.13	0.32
EMH	10;3	8;4	1;11	-1.8	-1.9	-0.7	0.96	0.49	2.04	0.45	-0.91
LAD	10;6	5;10	4;8	-2.4	-3.4	-0.1	-0.80	-0.49	-0.78	-0.98	-0.04
MER	10;10	7;11	2;11	-1.9	-1.6	-0.8	1.50	0.44	1.16	2.24	0.27
HEA	11;1	6;8	4;5	0.8	-0.9	-0.6	-1.09	-0.74	-1.36	-1.87	-0.15
HOS	11;8	8;1	3;8	2.9	0.8	-0.1	-0.57	-0.73	-0.63	-0.42	1.05
SAJ	12;3	8;4	3;11	-3.0	-1.7	-2.0	-1.44	-1.62	-1.48	0.06	0.85
DAD	12;3	7;7	4;8	-0.7	1.0	0.8	1.39	1.74	1.31	0.18	-0.57
MAS	12;4	10;5	1;10	-1.0	-2.2	0.3	-0.31	-0.31	0.41	-0.58	-2.27
LIB	12;8	7;8	4;11	-0.4	-0.2	0.0	-0.03	0.72	-0.38	-1.19	1.44
RAG	13;1	8;2	4;11	0.2	-0.2	1.4	1.74	1.55	1.34	0.86	0.08
LOC	13;3	10;9	2;6	-1.6	-0.9	0.8	0.51	0.16	0.15	1.03	0.46
ALP	13;8	9;7	4;2	-2.8	-1.7	-1.4	-1.62	-1.82	-1.56	-0.21	-0.13
M	**10;8**	**7;0**	**3;6**	**-1.21**	**-0.91**	**-0.48**					
SD	*1;10*	*1;0*	*1;1*	*1.72*	*1.07*	*0.96*					

Furthermore, the information from the parental questionnaire reveals that SAJ and ALP present a profile that could be interpreted as being at risk for atypical language development (see Appendix C for the questionnaire data). SAJ's parents reported each having difficulty with language. SAJ's mother reported being dyslexic and SAJ's father also reported general language difficulties. At the time of testing, SAJ's younger brother was in the process of undergoing a psychiatric evaluation for a possible developmental disorder, the outcome of which was not communicated to us by the family. Concerning ALP, his parents reported that this child has experienced persistent otitis media, which was ongoing at the time of testing. Although the effects of otitis media on language are not well understood (e.g., Asbjørnsen et al. 2005), it is possible that ALP's persistent difficulties with this issue put him at a distinct disadvantage with respect to L2 development.

Summarizing the findings from this section, the comparison of standardized test scores and clausal embedding measures allowed us to see that many of the L2ers have language abilities in French that are underestimated by standardized test scores. However, some L2 children had profiles in which standardized test scores were in the norm, but clausal embedding scores were lower than -1 *SD* compared to the rest of the group. This suggests that the clausal embedding measures underestimated the language abilities of these children. At T2, the clausal embedding measures appeared to have identified two children whose overall profiles make them likely candidates for atypical learners. All in all, the comparison of standardized tests and clausal embedding measures suggests that the analysis of clausal embedding measures could potentially be used to confirm or infirm low results on normed language batteries.

7.6 Conclusion

This chapter presented results from a comparison of a group of children with SLI and a group of children acquiring French as an L2. Section 7.2 presented comparative results on standardized test scores in French (word repetition and sentence completion) as well as standardized test scores in English for the L2 group (CELF). The comparative results for sentence completion revealed overlapping performance between the SLI and the L2 as a group. The L2 scores improved significantly from T1 to T2; however, on an individual level, 6 out of the 14 L2 children with more than 3 years exposure scored below -1.65 in the sentence completion at T2. The comparative results for the word repetition task revealed that the L2 had significantly higher scores than the SLI at both T1 and T2. Although the L2 children did not overlap with the SLI for phonology as a group, three out of fourteen L2 children with at least > 3 years exposure at T2 also scored below the cutoff for this task. With respect to L1 performance, the number of L2 children who did not perform within the age-appropriate norms on the English assessment (CELF) included almost half of the population at T1 and almost one-third of the population at T2. As has been shown previously in the literature, the L2 performance on standardized tests reveals that, even after 3-4 years LoE, these children obtain scores that put them at risk for being mistakenly diagnosed with SLI.

Section 7.3 reported on results based on measures of clausal embedding and measures of morphosyntactic accuracy. The general result to emerge from the analyses of clausal embedding was that the L2 produced subordinate clauses more frequently than the SLI and just as frequently as the TD8+11. Individual variation for these measures was considerable, but the proportion of L2 children with (approximate) age-appropriate performance was numerically, although not significantly, higher than the SLI. In contrast to the embedding measures, with respect to rates of erroneous utterances, the SLI and the L2 had similar performance at both T1 and T2.

Dividing the L2 and SLI into groups by age revealed an interesting pattern of differences. The L2 6-9 had significantly higher rates of embedding than the SLI 6-9, whereas the L2 9-12 did not differ from the SLI 9-12 for embedding. On the other hand, the L2 9-12 tended to produce relative clauses more frequently than the SLI 9-12 at T1. This result is interesting, given that fewer overall differences were found between the older L2 and SLI for general measures of clausal embedding. Although the difference between the older SLI and L2 for relatives was not statistically significant, it seems that a more careful study of relative clauses in older children might lead to a way of distinguishing between these two groups. However, concerning rates of erroneous utterances, the L2 9-12 made errors more frequently than the SLI 9-12.

Overall, the results for verb morphology and object clitic production revealed considerable overlap across the TD4, SLI, and L2 groups. The group means indicated that these populations were fairly accurate with these properties, with the exception of certain individuals. With respect to gender errors, the L2 had significantly weaker performance than the SLI and the TD4. The indefinite determiner was particularly prone to incorrect gender assignment, as has been shown to be the case for L2 adults. When the SLI made errors, masculine gender was used in a context that required feminine, whereas more L2ers made gender errors in both directions.

Concerning the rate of complex versus simple utterances that contain at least one error, the L2 and the SLI have similar results. The rate of erroneous complex utterances is significantly higher than the rate of simple utterances. However, the L2 significantly decrease their rate of erroneous complex utterances between T1 and T2, whereas the SLI do not.

One of the more striking differences to emerge from the results concerns the different types of correlations found between error rates and complexity measures. The correlation between embedding and error rates was negative in the SLI and positive in the L2. In the SLI, a very low rate of subordination is more frequently accompanied by a very high error rate. These learners tend to be younger and have difficulty producing even short, simple sentences without error. On the other hand, the L2 learners who have a high error rate tend to also use clausal embedding quite frequently. These learners tend to produce long, complex utterances that also contain errors in morphosyntax.

Section 7.4 presented correlation analyses between factors that are expected to influence L2 acquisition and L2 spontaneous language performance. Interestingly, LoE was correlated negatively with rates of erroneous utterances at T1, but there was no correlation between LoE and rates of clausal embedding. This finding suggests that the L2 children used clausal embedding from very early on in their development. On the other hand, LoE does appear to play a role in morphosyntactic accuracy: the children with less exposure made more errors.

Lastly, Section 7.5 analyzed clausal embedding measures in light of the standardized test scores. The overall result of this analysis suggests that clausal embedding measures have the potential to identify atypically-developing L2 children, whereas error rates do not.

8 Discussion

8.1 Introduction

The overall objectives of the current study were also follows: (1) Contribute to knowledge concerning the development trajectory of typical L2 acquisition in children, and thereby, (2) contribute to the larger research agenda which aims to disentangle the effects of bilingualism from the effects of SLI on language development, and (3) examine the impact that complexity, measured here in terms of clausal embedding, has on L2 child development. In this chapter, I will attempt to explain what the current study has contributed with respect to the objectives listed above. In Section 8.2, answers to research questions and responses to the predictions spelled out in Chapter 5 will be proposed. This chapter concludes with remarks on methodology and comparisons with previous research conducted on a subset of the population studied here (Section 8.4).

8.2 Research Questions and Predictions Revisited

This section proposes answers to the research questions and predictions spelled out in Chapter 5. The section is organized into subsections by research question.

8.2.1 What is the Impact of Computational Complexity on Child L2 Development?

8.2.1.1 Evidence from clausal embedding

The frequency of clausal embedding in the L2 group compared to the SLI on the one hand and to the TD8+11 controls on the other suggests that the majority of the L2 children studied here <u>do not avoid complex structures, such as those with clausal embedding, in spontaneous language</u>. This finding reinforces previous observations from the literature regarding the early emergence of clausal embedding in child L2 acquisition. However, this result appears to go against recent elicited production data from the same population that suggest that L2 children avoid complex syntactic operations such as wh-movement in interrogative structures (Prévost et al. 2010). I will return to these contradictory findings in Section 8.4.

Between-group results show that the SLI consistently used less frequent rates of clausal embedding compared to the TD8+11 and the L2. Furthermore, within-group longitudinal results, which revealed a drop in embedding in the SLI from T1 to T2, suggest that the SLI are not increasing their use of clausal embedding gradually over time like TD children have been shown to do (Loban 1976; Scott 1988; Scott and Stokes 1995; among others). In fact, this frank decrease in frequency of embedding suggests the adoption of avoidance strategies, which have been shown to be a common feature of spontaneous language in older children with SLI (Tuller et al. 2012).

In Section 3.4.3.2, the issue of relative clauses in the psycholinguistic literature was discussed. This particular type of subordinate clause is argued to involve a higher level of difficulty compared to other subordinate clauses studied here. In the results presented in Chapter 7, relative clauses were measured as a proportion of all subordinate clauses produced and as a raw number. The L2 and the SLI did not differ significantly in the number of relative clauses produced at T1 or T2. However, the SLI produced a significantly lower mean number of relative clauses compared to the TD8+11 at T1 and T2, but the L2 children did not. Although the L2 as a group patterned with the TD8+11 for the overall clausal embedding measures, the difference between the TD8+11 and the L2 for relative clauses tended towards significance. This tendency is reflected in the individual results which show that a handful of L2 children and children with SLI produced fewer than two relative clauses in their spontaneous language sample, whereas all TD8+11 children produced at least two relative clauses.

The smaller proportion of relative clauses versus non-finite complement clauses in the L2 group compared to the TD8+11 might suggest that the L2ers are slightly more sensitive to the computational cost involved in deriving relative clauses compared to other subordinate clause types, even though relatives have essentially the same structural properties in French and in English. As detailed in Section 5.5.1.4, relative clauses are hypothesized to be derivationally more complex than non-finite complement clauses. However, the L2ers seem less sensitive to the derivation of relative clauses compared to the SLI, given the very significant difference found between the SLI and the TD8+11. Again, the L2 have performance that falls between the TD8+11 and the SLI.

Related to question of the impact of complexity on L2 children, the prediction was made that TD L2 children, who are assumed to have healthy computational systems, should produce embedded structures at a rate that is appropriate for their chronological age. The clausal embedding measures at T1 and T2 generally showed that the L2 group was similar to the control group of TD8+11 year-olds, who were matched to the L2 and SLI groups by mean age. This prediction, which is based on the hypothesis that L2 children begin L2 acquisition with access to all syntactic operations thanks to L1 transfer, is therefore confirmed by these clausal embedding measures.

On the other hand, the SLI differed significantly from the L2 and TD8+11 for a number of clausal embedding measures, the most dramatic differences being at T2. The SLI findings suggest the presence of avoidance strategies through which embedded clauses are produced with less and less frequency. According to Jakubowicz's DCM account, the way that the computational system interfaces with the specific language processing systems (i.e., working memory) does not function the same in children with SLI compared to typically-developing children. Studies that have adopted this approach have argued that clausal embedding involves a derivation which is computationally costly and which can easily overload the processing capacity of children with SLI, thus creating difficulty for these learners (Tuller et al. 2012, Hamann et al. 2007). Because the production of clausal embedding is costly for children with SLI, they tend to avoid the use of this structure. On the other hand, TD L2 children, for whom embedding appears to pose no particular difficulty in the L1 or the L2, did not avoid embedding. Furthermore, the L2 children used embedding from early on in their L2 development: There was no positive correlation between LoE and embedding measures and no significant progression in embedding frequency from T1 to T2 in the L2 group. With the exception of LOC (LoE = 1;5) and LOS at T1 (LoE: 0;11), the L2ers with the least exposure to the L2 (including 3 children with 0;11 LoE and one child with 1;7) used embedding just as frequently as the L2 children with longer exposure. The frequent use of clausal embedding at arguably early stages of L2 child development reinforces the idea that the operation underlying embedding does not need to be re-acquired in the L2.

The direct SLI-L2 comparison with respect to clausal embedding suggests one type of divergent language pattern that exists between the two populations and at the same time provides us with a somewhat better understanding of how computational complexity impacts L2 child development. This comparison has allowed us to see that clausal embedding is not avoided, which indicates that this type of computation does not create major obstacles for the L2 population studied here.

8.2.1.2 Evidence from the link between errors in morphosyntax and clausal embedding

Previous research has shown that increasing complexity tends also to increase the likelihood of errors being made (Tuller et al. 2012; Prévost et al. 2011; Gillam & Johnston 1992; Pizzioli & Schelstraete 2008; Simon-Cereijido & Gutiérrez-Clellen 2007). Does a higher frequency of embedding mean a higher rate of errors in the L2 and SLI? Some researchers have argued that complex syntactic structures also tend to be longer, which increases the number of opportunities for errors to be made. One problem with using spontaneous data to answer this question is that the factor of utterance length is difficult to control for. The results obtained here do not allow us to disentangle complexity and length effects since these variables could not be controlled for in the spontaneous language data. However, the examination of the interaction of clausal embedding and errors using spontaneous language allowed for the observation of different developmental paths in the L2 and the SLI. In the L2 population, children who had higher MLUs and used embedding more frequently also made more errors. Therefore, it seems that either length or complexity may be linked to a higher error rate in the L2 group.

Strikingly, the same correlation was negative in the SLI. In other words, as the SLI increased their MLU and their use of embedding, they decreased the percentage of errors containing at least one error. Since the children with SLI with the shortest MLU and least embedding made the most errors, neither embedding nor utterance length appear to be linked to higher error rates in the SLI.

Whether it be for reasons of length or embedding, the fact that clausal embedding and morphosyntactic accuracy are related in very different ways points to an important distinction between the two learner groups. The L2ers use embedding from relatively early stages and, at the same time, are highly inaccurate in morphosyntax. As LoE increases, the L2ers improve in morphosyntactic accuracy. The SLI, on the other hand, appear to display a different trajectory. The youngest children with SLI avoided embedding and had very high rates of erroneous utterances. As these affected children grew older, they developed the ability to use subordination with more regularity and at the same time, their morphosyntactic errors decreased. This pattern seems to suggest that the ability to use subordination and the ability to produce target morphosyntactic forms develops in a different way in the L2 children compared to the children with SLI.

However, the question of whether the allocation of processing resources towards the derivation of an embedded clause creates a situation in which surface morphology is more likely to be non-target remains without a satisfactory response for the L2 group. Utterances with an embedded clause contained errors more frequently than utterances without; however, since complex utterances are also longer, it is difficult to isolate the particular impact that embedding had on error rates.

Although it is difficult to say whether length or complexity have an effect on error occurrence, looking at the rate of *error-free* utterances, such as those containing relative clauses, may be informative with respect to the impact of complexity on the L2 group compared to the SLI. The prediction was made that the L2 should have a higher rate of target complex utterances because the L2ers are hypothesized to have the capacity to draw on the L1 for the derivation of subordinate clauses, such as relatives. The fact that the operation of embedding does not have to be re-acquired in L2 acquisition could mean that the same processing cost is involved in the operation of subordination itself in the L2 compared to the L1. This means that fewer resources will be entailed in the derivation in the L2ers compared to the SLI, whose impairment makes subordinate clauses more difficult to process than monolingual TD children of the same age. The L2ers, therefore, should have more resources available to them for accessing morphological forms. If more available resources mean fewer errors, then the L2 should produce more target relative clauses than the SLI. Although the evidence is not overwhelming in support of this prediction, individual results showed that a greater number of L2 children had target relatives than children in the SLI group, which suggests that this idea is on the right track, and deserves to be further tested in a more controlled context.

Furthermore, the L2 significantly lowered their rate of erroneous utterances with an embedded clause from T1 to T2, whereas the same measure remained stable in the SLI. These different patterns between the two groups in the longitudinal data may also indicate the relative ease with which the L2 produce embedded clauses compared to the SLI. However, the SLI and the L2 have similar performance for the rate of erroneous simple utterances. It could be hypothesized that the production of simple utterances puts both groups on more or less equal footing, as the production of simple utterances stretches the processing load of the SLI to a lesser degree than complex utterances. However, the fact that errors occur in simple utterances might indicate that, at least for some of these learners, errors in morphosyntax are not necessarily linked to processing cost or that the strain on processing is not linked to embedding, as has been hypothesized, but to another variable, such as length or the general communicative demands of the spontaneous language context.

Summarizing the response to the question about the impact of derivational complexity on L2 children, the development of clausal embedding in the L2 appears to pose no major obstacle for these learners, unlike what was observed for the children with SLI. The rapidity and facility with which the L2 children come to use clausal embedding at age-appropriate levels supports the hypothesis that the syntactic operation underlying clausal embedding does not need to be reacquired in the L2 and does not involve a dramatically higher processing load compared to TD monolingual children. The SLI, on the other hand, are hypothesized to have computational and processing systems that do not function like those of TD children. Because the derivation of structures involving clausal embedding is more demanding in terms of processing load in children with SLI compared to TD children, the SLI avoid these structures. The L2 children, however, do not avoid these structures, as they are supported by a healthy computational system. Although the L2 were shown to use embedding with more frequency than the SLI, the rate of erroneous complex and simple utterances was similar between the two groups. The L2 decreased their rate of erroneous complex utterances over time; however, there is little evidence to support the idea that the apparent facility that the L2ers have with embedding allows them to make fewer errors than the SLI in utterances with subordinate clauses.

8.2.1.3 Chronological age and LoE in the SLI and L2 comparison

The second research question concerns whether the older L2 children and children with SLI pattern in the same way as younger children from the same populations and whether a group of L2 children with a wider range of LoE continue to pattern like the SLI.

8.2.1.3.1 Chronological age and SLI-L2 comparisons

The analysis by age group revealed some interesting differences between L2 and SLI. Following the trend of the overall group results, the L2 9-12 had consistently higher levels of clausal embedding than the SLI 9-12, although these differences only reached significance for the rate of deep embedding at T2, for which the older L2ers far out-performed the older SLI.

Individual results showed that the L2 9-12 group tended to produce relative clauses more frequently than the SLI 9-12 (the difference was not significant, but there was a tendency at

T1). This result is interesting, given that fewer overall differences were found between the older L2 and SLI for general measures of clausal embedding. Although the difference between the older SLI and L2 for relatives was not statistically significant, it seems that a more fine-grained study of relative clauses in older children might lead to a way of distinguishing between these two groups.

Concerning morphosyntactic accuracy, however, the older L2 children were often less accurate than the older children with SLI, especially at T2. Five L2 9-12 children with at least 3 years exposure had error rates of at least 20% at T2, whereas only one 9-12 child with SLI was over 20% at T2. The error rates of the older children with SLI are somewhat similar to what has been reported in other studies. Tuller et al. (2012) reported mean error rates of 15.5% (*SD* = 9, Range = 2.9 - 40%) in their group of older monolingual French-speaking children and adolescents with SLI (aged 11-16). Four children with SLI from their group had error rates above 20%. Recall that the older SLI in the current study had a mean error rate of 12.31% (*SD* = 5.3, Range = 5-24%). The fact that older L2 children have weaker performance than the older SLI in morphosyntactic accuracy is perhaps not entirely surprising if we consider that the older SLI have benefited from therapy and longer exposure to French than the older L2. Although the effects of SLI are long-lasting, the way that the impairment manifests itself in the same individual can change over time (Botting & Conti-Ramsden 2004). For example, therapy can help children with SLI reduce the frequency of morphosyntactic errors over time. Therefore, children with SLI may make fewer errors in morphosyntax as they age. This is not necessarily the case for L2 children. Older L2 children with limited exposure or who take a longer time to master a certain morphosyntactic property in the L2 could have weaker performance than a group of older children with SLI who may have already developed ways to mask their disorder. This is apparently the case for the 9-12 age groups that were compared in this study.

A different picture emerges from the comparison of the 6-9 age groups. The L2 6-9 had stronger performance for clausal embedding when compared to the SLI 6-9. These differences were significant at T1 for the rate of complex utterances and for all four measures of clausal embedding at T2. Furthermore, the L2 6-9 were generally more accurate in morphosyntax, but these differences were not significant. Although the difference did not reach significance, the younger L2ers tended to use the future or past tenses more often than the younger children with SLI. Both 6-9 groups produced similar numbers of 3P accusative clitics at T1. At T2, the

L2 6-9's mean number of 3P ACC was 2.5 times higher than the mean of the SLI 6-9, but this difference was not significant.

When looking at the SLI group as a whole, a significant inverse correlation was observed between error rates and age. On the other hand, the older L2 children continue to produce errors in morphosyntax as often as the younger L2 children. Other factors, such as LoE, are assumed to play a more important role than CA in determining error rates in the L2 group (e.g., the significant inverse correlation at T1 between LoE and rates of erroneous utterances). However, the SLI seem to decrease their errors (as well as their use of clausal embedding) as they age. In the current population, the L2 9-12 and SLI 9-12 groups are comparable in terms of some of the clausal embedding measures, but differ in terms of morphosyntactic errors, especially at T2. Judging from the results obtained here, it seems that older children with SLI should be compared to L2 children in mid or later stages of development for comparisons targeting morphosyntactic properties. On the other hand, it may be interesting to pair older children with SLI and older L2 children in early stages of acquisition for clausal embedding or other structures that are arguably more complex. The prediction would be that the older SLI would perform better for morphosyntactic accuracy, but the older L2 would perform better for clausal embedding.

The differences discussed here and in Chapter 7 between the L2 9-12 and the SLI 9-12 raise an important question with respect to the detection of SLI in older L2 children. If in fact errors in morphosyntax decrease with age in children with SLI, but not in older L2 children, then this increases the risk that an older TD L2 child would be mistaken for SLI. An additional factor that increases the risk for mistaken identity in older L2 children compared to younger L2 children is the reduced variability in language performance in older monolingual TD populations. As TD L1 children age, the variability in their morphosyntactic performance decreases. Depending on how a particular standardized test is constructed, this decrease in variability could mean that some raw scores that are only a couple of points from the mean may translate into a very low z-score for the child.

Although the bulk of the research on SLI in L2 children has focused on the identification of SLI in younger L2 children, one could imagine that an immigrant child who arrives in his or her host country at a later age and who hails from a country where children are not screened for language impairment would be particularly difficult to evaluate using typical monolingual standardized assessments. The same child could also be expected to make a higher rate of errors in spontaneous speech compared to a monolingual child with SLI of the same age. The error rates such as the ones found in the 9-12 L2 group, coupled with the decreasing variability in the older norm-referencing population may create a situation in which older L2 children are at even more at risk for mistaken diagnosis of language impairment than younger L2 children.

8.2.1.3.2 LoE and SLI-L2 comparisons

Previous direct comparisons of children with SLI and L2 children have generally focused on younger children (aged 6-9 approximately) who have less exposure to the L2 (< 2 years). The L2 group studied here included a wider range of LoE, from 0;11 to 4;0. The question was asked if L2 children with a wider range of LoE still compare to children with SLI. Does having a larger range of LoE in the L2 group lead to results that differ from previous SLI-L2 comparisons? Because the SLI and L2 cannot be matched on LoE, the answer to this question will be based on overall group comparisons and on the analyses of certain children with longer LoE.

The number of language measures for which the L2 and SLI groups had overlapping performance indicates that L2 child groups with a wider range of LoE still pattern with the SLI. Interestingly, at T2, when the upper limit of the LoE range of this L2 group reaches 4;11, there remains a considerable amount of overlapping performance in morphosyntactic accuracy between the two groups. For example, concerning the standardized sentence completion task, out of the 9 children with LoE > 4;0 at T2,[111] 4 of them have z-scores between -2.44 and -3.77 *SD* (the SLI mean z-score at T2 was -2.21). With respect to the rate of erroneous utterances in spontaneous language, out of the same 9 children with LoE > 4;0, 7 of them have rates between 20-30% (the mean in the SLI at T2 was 18%). The SLI and L2 also patterned more or less together at T1 for verb morphology and object clitics, but the L2 tended to show more improvement from T1 to T2 for these properties.

The clausal embedding analyses revealed that the L2 embed more often than the SLI and that there is no correlation between LoE and embedding in the L2. Therefore, the SLI and L2 differ with respect to rates of clausal embedding in spontaneous language regardless of the LoE of the L2 group.

[111] Recall that the following children fall into the category of children with >4;0 LoE at T2: ALP, BEA, DAD, HEA, IOC, LAD, LIB, LEP and RAG.

8.2.2 L2 Factors

A third research question asked **how factors such as chronological age (CA), AoO, LoE, L1 skills, and working memory contribute to overall success in child L2 development.** The question of the role of factors such as CA, AoO, LoE, L1 skills, and working memory (WM) in L2 development were addressed via correlation analyses in Chapter 7 (Section 7.4).

8.2.2.1 Impact of LoE on L2 performance

A pattern that emerges quite robustly from the results is the different role that LoE played in the development of embedding compared to overall morphosyntactic accuracy. As mentioned previously, the L2 group used embedding with the same frequency as the TD8+11, regardless of low LoE (e.g., EMH, HAS, and MAS who had a LoE of 0;11 and ALC who had a LoE of 1;7 and who had rates of subordination that were within 1 *SD* of the TD8+11 mean) and there were no significant differences for rates of embedding from T1 to T2. However, morphosyntactic accuracy is related to LoE in a different way. Even though some L2 children made frequent errors, even after 3 years LoE, the rate of erroneous utterances fell from T1 to T2, and the rate of accuracy in verb morphology increased significantly from T1 to T2 as did the rate of object clitic production. This pattern suggests that LoE has a different impact on morphosyntactic accuracy compared to embedding in this L2 population. The link between morphosyntax and LoE echoes what has been observed in previous work. For example, Hakuta et al. (2000) showed that L2 children learning English took approximately 3-5 years to develop oral proficiency. Jia & Fuse (2007) showed that L2 children learning English still had not mastered the regular past tense marker *–ed* after five years of exposure. Marinis & Chondrogianni (2010) concluded that 4 years was sufficient for 8- to 9- year-old children to test within the TD L1 norm on a standardized tense morphology task (TEGI). Therefore, the results from this study support the idea that morphosyntactic accuracy takes time, perhaps somewhere between 3-5 years or longer, depending on the particular property to be acquired and on the internal and external factors associated with the acquisition context. In the L2 group studied here, accuracy with gender marking was particularly low in some children and did not correlate with LoE. This suggests that some L2 children, such as the child DAD, require more than 4 years LoE to master gender agreement in French.[112]

[112] Recall from chapter 7 that DAD had 56 months of exposure at T2 as well as very high performance on all standardized tests and for clausal embedding measures. Despite this profile, she produced gender agreement at one of the lowest accuracy rates: 84% (67 correct out of 79 obligatory contexts).

Do the results from this study echo what has been found concerning the impact of LoE on previous work on child L2 and on SLI-L2 comparisons? Paradis & Crago (2000) found that their group of L2 children (aged 6;7, LoE = 2;0) patterned with an age- and MLU-matched group of children with SLI with respect to correct verb finiteness. The results of the present study showed that the L2 children were generally more accurate than the SLI with respect to verb finiteness, with the exception of one L2 child (HAS) with 0;11 months exposure at T1. In the L2 group studied here, approximately one year of exposure was apparently sufficient for the children to get beyond the RI stage (assuming they went through one at some point). Very few L2ers omitted verbs in finite contexts, whereas this was a more common occurrence in the SLI group. At T1, the L2 group studied here included 6 L2ers with 18 months or less of exposure. Out of these 6, only one produced RIs. Furthermore, there was little evidence to argue for a stage in which the L2 or SLI use the present tense as a default finite form. The data on Kenny and Greg (Prévost & White 2000) showed that the RI stage lasted about 19 months (the recordings began when Kenny had a LoE of about 0;2 and Greg had 0;5). Taken together, the results from the current study and the results from Prévost and White (2000) appear to show that a LoE of between one and two years is sufficient for an L2 child learner of French to have ceiling level performance in finiteness; whereas Paradis & Crago's (2000) results suggest it might be longer. Root infinitives were not common in the SLI group either, which supports what has been found previously for French-speaking children with SLI (Jakubowicz et al. 1998). Overall, one can also note that the L2 and SLI groups tend to be fairly accurate with finiteness. This suggests that the root infinitive stage is a somewhat marginal phenomenon in both French-speaking children with SLI and L2 children acquiring French compared to learners of other languages such as English.

With respect to object clitics, Paradis (2004) compared rates of accusative clitic production in the spontaneous speech of a group of L2 French children compared to a group of L1 French-speaking children with SLI. Recall from Chapter 4 that these two groups were aged 7;0 on average and the L2ers have 2 years of exposure. Paradis' results showed that the L2 and the SLI had similar rates of production for object clitics (approximately half of obligatory contexts), but the errors that they made differed slightly. Although omission was the most frequent error type, the children with SLI in Paradis' study had a tendency to make more errors in gender, number or case compared to the L2. The L2, on the other hand, used strong pronouns instead of clitics more often than the SLI. In the current study, the overwhelming error was omission in both groups. A slight difference could be noted with respect to case errors, for which the L2 group made six (sum of all case errors across the whole group) and the SLI made one; however, these errors seemed so marginal that no solid conclusion could be drawn from them. It could be that the wider range of LoE of the current L2 group was behind some of the differences observed in the current study compared to Paradis' results. However, the L2 children with limited LoE in the current study did not make errors using strong pronouns either, so LoE might not explain the adoption of the strong pronoun strategy in L2 children.

Unlike what was found for verb morphology and object clitics, there was no significant correlation between LoE and gender accuracy. Although the L2 scored above 90% on average, they were significantly less accurate than the SLI and the TD4. It seems, therefore, that gender errors can persist in the L2 population even after many years of exposure to the L2. The group results for gender differ from what was found by Paradis & Crago (2004) for 15 L2 children (L2 French, L1 English, mean age = 6;10; LoE = 2;0) compared to 10 L1 French-speaking children with SLI (mean age = 7;6; see Section 4.3.3.1). Although these authors also found that the SLI and the L2 group results revealed a high rate of accuracy (>85%), they observed no significant differences between the SLI and the L2. It is possible that the different results obtained in the current study versus Paradis & Crago (2004) are due to the number of forms that were considered for gender marking. Recall from Section 4.3.3.1, that determiners and amalgamated forms in partitive and locatives, such as du (de 'of'+le.MASC) and au (à 'to'+le.MASC) were analyzed for gender agreement in their study. The current study examined determiners, amalgamated forms, adjectives, nouns, and the quantifier *tout*. This could have contributed to the weaker results obtained by the L2 group in the current study. Furthermore, the children in Paradis & Crago began their exposure to French at the beginning of kindergarten, whereas some of the children in the current study had relatively late AoO (>7;6). The earlier AoO in Paradis & Crago's study might have been helpful in acquisition of gender. The overall results for gender in the L2 group are similar to what has been documented in the literature on child L2 learners of French. Studies such as those conducted by Meisel (2009) and Granfeldt et al. (2007) found that L2 children make errors in gender agreement and that they do not acquire gender as easily as monolingual children have been shown to do (Clark 1985).

8.2.2.2 Impact of AoO on L2 performance

Although the correlation between CA and AoO made the interpretation of the results challenging, earlier AoO was associated with a higher rate of object clitic production at T1 and with a higher z-score on the word repetition task, although the latter correlation did not reach significance. Besides these correlations, few significant results were observed between AoO and other language measures. The lack of significant correlations with AoO in this particular group of L2 children supports Meisel's hypothesis concerning the upper age limit for 2L1 acquisition. Meisel (2009) proposes to consider that major changes take place concerning the acquisition of morphosyntax at around age 4;0. Acquisition after this age is hypothesized to be qualitatively different from acquisition younger than approximately 4;0. All of the L2 children in the current study have a minimum AoO of 4;0. Following Meisel's hypothesis, once the AoO of 4;0 is exceeded, no advantage is predicted based on AoO. For example, the children with an AoO of 4;5 would not have an advantage over the children with an AoO of 9;0, for example. If this is in fact the case, then all of the L2 children in the current study are on the same footing with respect to AoO and there is no reason to expect a correlation with AoO and language performance in this group. On the other hand, this lack of correlation with AoO could also mean that the properties that were analyzed in this study are simply not sensitive to AoO, with the exception of object clitics. Another possible explanation is that longer exposure is needed before the influence of AoO on these properties becomes observable. It may be that the effects of an earlier AoO do not influence L2 performance in earlier stages of acquisition, but may take effect in later stages. The results from Meisel (2009) and the results from the current study suggest that children with an even younger AoO (approximately 3;0) should be used to study the question of critical period effects on the acquisition of morphosyntax in L2 learners.

8.2.2.3 Impact of working memory on L2 performance

Working and short term memory were measured in French and English using the WISC-IV digit span task. The task was administered in both languages to see if different results were obtained by language for the L2 children. The results showed that, as a group, the L2 children did not differ significantly in their digit spans in French compared to English. However, concerning correlations with other language measures, it was interesting to note that only the English version of the backwards span correlated with other measures in French or English (Recalling Sentences from the CELF, proportion of relative clauses in spontaneous language). Even though the L2 children had the same group results in English and in French for the digit span task, it may be that the scores in English are a better reflection of their working memory capacity.

As stated above, the backwards digit span score in English (DSB-E) was linked to the production of relative clauses. The production of relative clauses is hypothesized to entail a higher cost in terms of processing load (e.g., working memory) in language learners from various developmental contexts (Delage 2008; Monjauze 2007). However, one can wonder why other measures, such as those involving clausal embedding, the rate of erroneous utterances, or the production of object clitics were not also correlated significantly with digit span scores, seeing as these measures have also been hypothesized as being related to working memory capacity (Tuller et al. 2011, Tuller et al. 2012). It may be the case that digit span measures a certain aspect of working memory that is not used in language processing (e.g., Butterworth et al. 1986). Or, it could be the case that the hypothesis concerning the link between working memory is not correct. The lack of correlation between the digit span scores and language measures might also mean that the production of certain types of arguably complex syntactic structures, such as embedded clauses, are not related to working memory (Gvion & Friedmann in press).

8.2.2.4 Impact of L1 skills on L2 performance

Research on L2 children has suggested that the L1 can be affected by the L2 acquisition context. It is important to understand what to expect from a typical versus an impaired L2 child in terms of L1 performance. As was mentioned in Chapter 7 (Section 7.2.5), approximately half of the L2 children had scores that fell below the cutoff for potential language impairment at T1. An examination of CELF scores at T1, French test scores, spontaneous language measures and information from the parent questionnaire led to the conclusion that some of the L2 children scored below the cutoff because their L2 situation makes it difficult for them to maintain skills in their L1 that are at the same level as their monolingual age peers. This reinforces what has been noted about L2 children being disadvantaged by standardized assessments based on TD monolingual norms (Paradis 2005; among others). However, most of the L2 children who scored below the cutoff had standard scores of at least 80. One exception was PUS, who had extremely low CELF scores at T1 (z-score = -3.2) and T2 (z-score = -2.8), but scored in the norm on standardized tests in French. Information collected via the parental questionnaire revealed that PUS speaks little English at home with her siblings (one of whom is her twin) or mother compared to the rest of the L2 children.[113] PUS's profile could be explained by L1 attrition, incomplete acquisition of the L1, or dominance shift. Given that PUS had an early AoO (4;6), it possible that she never fully acquired her L1. The literature on the question of L1 skills in L2 children is relatively recent (see Montrul 2008b for a review) and to my knowledge there is no easy way to answer this type of question with more precision, given the data that was collected for PUS.

L1 skills, as measured by the CELF, were generally not related to other spontaneous or standardized measures, except to working memory. This correlation is assumed to be due to the nature of the CELF tasks, which have a very strong memory component.

Summarizing, out of all of the factors discussed in this section, LoE appeared to have the most impact on language performance. LoE was correlated positively and significantly with verb morphology and object clitics in the L2 population. However, factors such as AoO, working memory, and L1 skills did not have an observable effect on the language measures analyzed in this study. The performance demonstrated by the current group of L2 learners more or less resembles what has been documented in the literature for verb morphology, object clitics and gender agreement.

8.3 Delineation of healthy developmental paths in child L2

8.3.1 Frequency of embedding in L2 children

Given the objective of understanding how to identify a TD L2 child from the L2 child with SLI, the fourth research question concerns whether **the analysis of measures such as rate of subordination and error analyses can contribute to the delineation of healthy and impaired child L2 developmental trajectories.** The answer to this question appears to be affirmative in some respects. First of all, the results demonstrated that rates of embedding and morphosyntactic accuracy in spontaneous language develop differently within the same L2 child learner. The majority of the L2ers were shown to have used clausal embedding at near age-appropriate rates relatively early in development. Although the delimitation of early, middle and late stages of L2 child development are difficult to pinpoint, I would argue that, compared to morphosyntactic accuracy, clausal embedding becomes age-appropriate quite quickly. The fact that clausal embedding emerges early is important to detecting SLI in

[113] PUS is reported to speak English often (3) with her mother sometimes (2) with her siblings. The mean for the rest of the group for English use with the mother is 4.4 and 3.4 with siblings. This indicates that PUS uses English less frequently at home compared to other L2ers in the group.

bilingual populations. If clinicians know that a certain structure emerges quickly or does cause problems in typical child L2 acquisition, then a delay in or difficulty with such a structure cannot be attributed to the L2 context. In addition, the L2 group results for embedding were significantly better than the SLI, which shows that clausal embedding represents a fruitful domain for the investigation of differences between these two groups.

Related to the question of whether the analysis of clausal embedding can contribute to the delineation of healthy and impaired L2 children, it was predicted that impaired L2ers could be identified based on clausal embedding measures. In Section 7.5 of the results, measures of clausal embedding were compared to the results obtained from standardized measures. In most cases, measures of clausal embedding showed that the children with low standardized scores produced age-appropriate rates of embedding. However, there were cases in which L2 children with normal standardized test score had low rates of embedding. At T2, both clausal embedding and standardized test scores identified SAJ and ALP as being poor performers. Information from the parental questionnaires also suggested that these children could be atypical learners. These results partially support the prediction and suggest that clausal embedding may be a promising structure to consider in the identification of SLI in L2 children. However, a more controlled elicitation test, such as sentence repetition or a story retelling task, might allow for cleaner results. This idea will be revisited in Section 8.4.

8.3.2 Morphosyntactic Accuracy

Morphosyntactic accuracy, on the other hand, was correlated with LoE. Furthermore, concerning overall error rates and accuracy with respect to verb morphology, object clitics and gender agreement, the L2 were similar to the SLI and were far from being age-appropriate when compared to the TD8+11. Whereas the frequency of clausal embedding could potentially be helpful in distinguishing typical from impaired L2 development, lower morphosyntactic accuracy, as it was studied here, does not necessarily signal atypical development, even after several years of exposure to French. Verb omission and protoforms were produced by children with SLI and not by the L2; however, the use of these phenomena was restricted to a couple of individuals. The distribution of errors (erroneous complex utterances versus erroneous simple utterances) did not consistently distinguish the SLI from the L2 either, despite evidence that the L2 displayed more progress than the SLI in improving their rate of targetlike complex utterances. Identifying language impairment in L2 children on the basis of morphosyntactic accuracy would therefore appear to be less efficient, given that clinicians would have to know how much exposure is necessary before a certain rate of accuracy can be expected and then wait until the child reaches this level of exposure before being able to decide whether the child is impaired or not.

Another interesting pattern emerged when comparing standardized test scores, embedding measures and morphosyntactic accuracy. When embedding and erroneous utterances were compared with the TD8+11, most of the L2ers performed like the TD8+11 for embedding, but well below this control group for rate of erroneous utterances. Interestingly, when the L2 individual scores are compared to the L2 mean, the L2ers with fewer errors do not necessarily perform well on other measures (e.g., SAJ at T1 and T2). An overall rate of erroneous utterances that includes any type of morphosyntactic error does not contribute to the delineation of typical or atypical development paths in child L2.

8.4 Remarks on Methodology

8.4.1 Clausal embedding and spontaneous language

This section discusses methodological pitfalls that should be considered when interpreting the results presented in this study and when moving forward with research or clinical tool creation for the identification of SLI in L2 child populations.

The motivation behind the use of spontaneous language to collect data was that it would allow for the calculation of measures involving clausal embedding and morphosyntactic accuracy. Furthermore, the language measures are collected in a natural setting, which ensures a correct pragmatic context for language production. This natural setting also gives the participant the choice as to what lexical, morphosyntactic, and structural items he or she would like to use throughout the course of the conversation. The frequency of such structures can be interesting to analyze, as has been done here; however, the motivation behind the selection of one structure over another by the child cannot always be known. Furthermore, this relative freedom of structure selection introduces a certain amount of variability to experimental groups that are already known to be highly heterogeneous. This variability, as evidenced by the high standard deviations throughout this study can create obstacles for statistical analyses and for overall interpretation. In the literature, studies that use spontaneous language measures have often used story-telling or retelling methods to elicit semi-spontaneous language. Intuitively speaking, this type of spontaneous language collection seems to be more efficient in terms of reducing variability. This type of spontaneous data collection may also help mitigate the effects of shyness on language production. For example, the L2 child LIB, whose standardized test measures were entirely normal, appeared to be very shy and somewhat unwilling to participate fully in the conversation, which could in part explain her low embedding measures at T1.

In spite of these methodological concerns, the overall group results from the current study reveal important information about potential differences between the SLI and L2 groups, which could be explored with more precision using elicitation tools. One potential tool that could be used to better target structures with various depths of embedding is sentence repetition. If in fact it is the case that typical L2 children have little difficulty with subordination, but the SLI do, then typical L2 children should be able to repeat structures with deeply embedded clauses in a sentence repetition task; whereas, children with SLI might repeat the structure differently in a way that would reduce complexity and alleviate processing cost. A task such as sentence repetition could allow for a certain number of variables (vocabulary, length, embedding, and morphosyntactic properties) to be controlled for or targeted.

8.4.2 Comparing spontaneous language and elicitation results

Another consideration when interpreting spontaneous language data concerns the different results obtained in elicitation tasks in the same group of L2 children. Based on cross-sectional elicitation data of wh-questions by essentially the same population of L2 children and children with SLI as the current study (see Section 4.4.2), Prévost et al. (2010) showed that both learner groups preferred questions in which the wh-word was *in situ*, an arguably less complex interrogative strategy than wh-fronting according to Jakubowicz's DCM. Interestingly, a correlation analysis of the rates of *in situ* collected from the question experiment and the rates of clausal embedding in spontaneous language revealed no significant correlation between the two.[114] Moreover, using the same task, Prévost et al. (2011) showed that the L2 produced quantitatively fewer morphosyntactic errors in the production of wh-questions then the SLI. This suggests that asking a child to produce a specific structure can create a situation in which a child with SLI would make a greater

[114] At T1: rate of wh-fronting & rate of subordination: r_s = -0.07, p = 0.75; at T2: rate of wh-fronting & rate of subordination: r_s = 0.13, p = 0.56.

quantity of errors than the L2. A task of this nature therefore has potential to discriminate between impaired and typical L2 learners.

The production of accusative clitics by nearly the same group of L2ers was also explored via an elicited production task (see Section 2.3.2.3). The results showed that the L2 often produced full DPs instead of the more pragmatically felicitous object clitic pronoun. The use of this DP strategy is widely documented in elicitation tasks of this type (Haiden 2011; Tuller et al. 2011). The spontaneous language results presented in the current study showed that very few infelicitous DPs were used. In fact, some object pronouns were used when the referent was not discursively salient, in contexts where a DP was expected. What explanations can be proposed for these different performance patterns? Concerning the wh-question elicitation task, the use of wh-in situ is a perfectly grammatical option in the experimental context. In spontaneous language, however, the avoidance of embedding can sometimes decrease communicative effectiveness or result in a grammatically awkward utterance (as in (118-119)).

(118) I saw a girl who I like.
(119) I saw a girl. I like this girl.

One could imagine that the L2 children would strive to express the same ideas in the L2 as they are able to express in their L1. This motivation might push them to use clausal embedding and prevent (most of) them from adopting avoidance strategies.

In addition to differing in rates of *in situ* versus rates of embedding, the L2 group made fewer errors in the wh-question elicitation task compared to spontaneous language. It seems that the children with SLI who had the highest error rates in spontaneous language also produced a very high rate of erroneous questions. Recall that in spontaneous language, some children with SLI had a very high error rate and a very low rate of embedding, but that almost no L2ers fit this profile. These children with SLI were not able to correctly produce a question most of the time; however, those L2 children who produced many errors in spontaneous language did not have the same difficulty in the question task. It seems that somehow the L2 were able to consistently produce target-like wh-questions in a task that provided the model for morphosyntactic properties such as tense and gender. However, these same children were less capable of consistently producing target-like utterances when faced with the communicative demands of conversation and narration during which they must choose what syntactic structure, lexical items, and morphosyntactic properties allow the expression of a particular message. These two different tasks apparently place different demands on the L2 children, which may somehow result in quantitatively different error rates. [115] Interestingly, the younger children with SLI are generally unable to produce target-like structures in either context.

With respect to the accusative clitic task, one can suppose that the different pragmatic properties of the spontaneous language context versus the elicited production task are responsible for these differences. In the elicitation task, the pragmatic context in which the participant is placed is a context in which a felicitous response contains an object clitic. In spontaneous language, these can be contexts in which the choice is less clear. It could be that having to keep track of when to use a DP or a pronoun demands a certain number of calculations on the part of the child. What is interesting, however, are the different response patterns. In previous studies (Tuller et al 2011), it was hypothesized that DPs were used instead of object clitics because the use of a clitic was too computationally costly, due to non-canonical SOV order and to other syntactic and morphological properties.

Two explanations are plausible in the face of these results. Either the demands of pronouns versus the DP choice in spontaneous language are wildly different from experimental contexts, in which case the results from each context can be interpreted separately or the "fabricated" pragmatic context in the elicitation task does not elicit object pronouns in all learner types.

8.5 Conclusion

The goal of this chapter was to discuss the research questions and predictions that were spelled out in Chapter 5 in light of the results presented in Chapter 7. The prediction that L2 children should use embedding at an age-appropriate rate was supported by the data. However, the prediction that L2 children with lower rates of embedding should be considered for language impairment was only partially supported by the data. The L2-SLI comparison by age group revealed that the younger age groups differed for several language measures, whereas the results from the older age groups were more similar. The impact of factors such as LoE, AoO, L1 skills, and working memory on the L2 results were discussed. LoE clearly

[115] The mean error rate for the wh-question task for the L2 children studied in this thesis at T1: M = 13.32, SD = 18.6, Range: 0- 86%; at T2: M = 6.5, SD = 8.1, Range: 0- 33%; and for the SLI at T1: M = 28.7, SD = 20.2, Range: 7.4 - 93.9%; T2: M = 23.5, SD = 21.8, Range: 0 - 88%.

impacted morphosyntactic accuracy, but had no observable effect on the rate of clausal embedding. Explanations were offered in light of the lack of significant correlations between language measures and working memory. The difficulty in identifying SLI in an older L2 child was also discussed. Moreover, it was concluded that SLI-L2 comparisons with L2 groups that include children with LoE longer than 2;6 years give results that are similar to previous comparisons with L2 children that have more limited LoE. The last section of this chapter reviewed the methodological questions that were raised during the interpretation of the results. Previous studies carried out on a subpart of the current L2 population were discussed and results from elicitation tasks were compared to spontaneous language measures. Different types of elicitation tasks which target clausal embedding, such as sentence repetition, were presented as alternatives to spontaneous language.

9 Conclusion

9.1 Conclusion (English)

The principal goal of L2-SLI comparative research is to disentangle the effects of bilingualism from the effects of language impairment in child L2 language development. This thesis sought to contribute to this goal by adding to the research on typical developmental trajectories in TD L2 children. Better insight into typical child L2 development is an important step in understanding how to identify language impairment in L2 children, given that identifying what is atypical requires an understanding of what is typical. To this end, the L2 children in this study were compared to a group of monolingual children with SLI. The SLI-L2 comparison in the current study proceeded in the following manner: Language performance in a group of (presumably) typically-developing L2 children was analyzed and compared to a group of children with SLI. The implication was that those children in the L2 group who had consistently weak performances relative to the other L2 children and whose performance was also similar to the children with SLI are in fact atypical learners.

The background for this study was based on the notion that computational complexity constrains language development. Prior work from this perspective has shown that arguably complex structures create obstacles for children with SLI: These learners avoid structures such as subordinate clauses or produce them with errors in morphosyntax. On the other hand, child L2 development has very rarely been studied from a complexity standpoint. Previous research has shown, however, that L2 children acquire syntax and morphology in different ways (Schwartz 2004). For example, investigations in the emergence of CP in L2 children indicate that embedded clauses emerge relatively early in development, while errors in morphology persist. The results from the literature on SLI on the one hand and from the child L2 literature on the other suggest that the study of clausal embedding might point to differences between the two learner groups.

The results from this study suggest that the L2 learners have more facility with clausal embedding compared to the SLI, as evidenced by a higher frequency of use in spontaneous language. A comparative analysis of morphosyntactic accuracy, however, revealed similar performance in the L2 compared to the SLI. Furthermore, some L2 children with long LoE continued to produce errors at relatively high rates. This constellation of facts leads to the conclusion that the study of clausal embedding presents a promising way forward in distinguishing between typically- and atypically-developing L2 children. However, because morphosyntactic properties can take (a long) time to develop in L2 children, accuracy in morphosyntax alone (i.e., as measured simply by the number of erroneous utterances in spontaneous language) does not seem to be a promising domain for differentiating between children with SLI and L2 children. In fact, the results from the current study, along with mounting evidence from the literature, suggest that healthy L2 development can be characterized by (frequent and relatively long-lasting) errors in morphosyntax.

Having found that many L2 children use clausal embedding more often that children with SLI and that certain L2 children with low rates of embedding also had other characteristics that signaled a risk of language impairment (e.g., weak standardized test scores and family medical history, as in the case of SAJ), the hypothesis can be made that avoidance of clausal embedding is a sign of atypical development in L2 children. Of course, given the individual variability inherent in L2 children and in spontaneous language data, a fruitful line for further testing of this hypothesis would be to use elicitation techniques such as story re-telling or sentence repetition, targeting clausal embedding.

Finally, I believe that the results obtained here suggest that studying child L2 from a computational complexity standpoint can yield interesting results. It appears that there is much to be gained through the study of the interaction of complexity and L1 transfer in child L2 development.

9.2 Conclusion (French)

Les études menées dans le cadre de la comparaison L2-TSL visent à mieux distinguer ces deux populations sur le plan linguistique. Dans ce contexte, cette thèse visait à apporter des données supplémentaires quant aux trajectoires développementales observées chez l'enfant L2 sain. En effet, une meilleure connaissance du développement L2 enfantin typique constitue un préalable indispensable pour l'identification des troubles du langage chez les enfants L2. Pour cela, les performances langagières d'un groupe d'enfants L2 au développement supposé typique ont été analysées et comparées à celles d'un groupe d'enfants avec TSL appariés en âge. L'hypothèse selon laquelle les enfants L2 qui présentent des performances très inférieures au reste du groupe L2 et proches de celles des enfants avec TSL connaissent un développement L2 atypique a ensuite été explorée.

Le cadre théorique adopté dans cette thèse repose sur l'idée que la complexité computationnelle contraint l'acquisition du langage. Plusieurs études antérieures, menées dans ce même cadre, ont montré que les structures qui impliquent un degré élevé de complexité syntaxique sont sources de difficultés importantes chez les enfants avec TSL. En effet, lorsqu'ils le peuvent, ces enfants tendent à éviter la production de structures complexes, comme les propositions enchâssées, au profit de structures syntaxiquement plus simples. Lorsqu'elles sont produites, ces structures sont également associées à des taux d'erreurs morphosyntaxiques plus importants que les structures plus simples. Chez les enfants L2, l'impact de la complexité computationnelle sur les performances linguistiques a été relativement peu étudié. Plusieurs études ont montré que ces enfants n'acquièrent pas les propriétés syntaxiques et morphologiques de la L2 de façon similaire (Schwartz 2004). L'analyse de l'émergence de CP indique, par exemple, que les propositions enchâssées émergent dans la L2 de façon précoce, à un stade où les apprenants continuent de produire des erreurs morphologiques. Ces résultats, comparés à ceux de la littérature concernant les enfants TSL, nous ont conduit à supposer que l'analyse de l'enchâssement pourrait mettre en évidence des différences entre ces deux groupes.

Dans l'ensemble, les résultats de cette étude confirment que les apprenants L2 ont plus de facilité avec l'enchâssement propositionnel que les enfants avec TSL, comme l'indique leur fréquence d'utilisation plus élevée de propositions subordonnées en langage spontané. Toutefois, ces deux groupes d'enfants présentent des performances similaires pour la production d'un certain nombre de propriétés morphosyntaxiques, à savoir la morphologie verbale, les pronoms clitiques objet et le genre grammatical. Nos résultats permettent également de noter que même après plusieurs années d'exposition, certains enfants L2 continuent de produire des erreurs morphosyntaxiques à des taux relativement élevés (parfois proches de ceux des TSL). Prises ensemble, ces observations suggèrent que l'étude de la subordination comporte des clés potentiellement intéressantes pour distinguer un pattern d'acquisition typique de la L2 d'un pattern d'acquisition atypique. En revanche, l'étude isolée des erreurs morphosyntaxiques (i.e., telle qu'elle est mesurée par le taux d'énoncés erronés en langage spontané) ne permet pas de différencier les enfants L2 au développement typique des enfants L2 qui présentent des difficultés langagières. Sur ce point, nos résultats sont donc en accord avec un nombre croissant d'études qui indiquent que le développement L2 typique peut être caractérisé par des erreurs durables en morphosyntaxe.

Comme nous l'avons évoqué, le groupe d'enfants L2 étudié compte une majorité d'enfants qui utilisent des propositions subordonnées plus fréquemment que les enfants avec TSL. Ce groupe comporte également quelques enfants qui présentent un taux d'enchâssement faible. Observant que parmi ces enfants qui utilisent peu la subordination, certains présentent aussi des facteurs de risque de trouble du langage, nous avons fait l'hypothèse qu'un évitement de la subordination en langage spontané pourrait constituer un indice de développement atypique chez les enfants L2. Toutefois, compte-tenu de l'importante variabilité interindividuelle qui marque les résultats de cette étude (variabilité caractéristique des deux populations étudiées, mais également des mesures de langage spontané), cette hypothèse mériterait sans doute d'être explorée de façon plus rigoureuse à l'aide de tâches expérimentales qui ciblent la production des propositions enchâssées, telles que les récits structurés ou la répétition de phrases. De telles épreuves permettraient en effet de mieux contrôler certaines variables ayant trait à la complexité.

Au total, les résultats que nous avons obtenus suggèrent que l'étude de complexité computationnelle, en interaction avec le transfert de la L1, constitue une approche prometteuse en acquisition L2 enfantine.

Bibliographie

Bibliographie

Abdi, H. (2007). RV coefficient and congruence coefficient. In N. J. Salkind (Ed.), *Encyclopedia of Measurement and Statistics* (pp. 849–853). Thousand Oaks, CA: Sage.

American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders, Text Revision DSMIV-TR* (4th ed.). Washington, D.C.: American Psychiatric Association.

Anderson, R. (1996). Assessing the grammar of Spanish-speakingchildren: A comparison of two procedures. *Language, Speech and Hearing Services in Schools*, *27*, 333–344.

Aram, D. M., Ekelman, B. L., & Nation, I. E. (1984). Preschoolers with language disorders: Ten years later. *Journal of Speech and Hearing Research*, *22*, 232-244.

Armon-Lotem, S. (2010). Instructive bilingualism: Can bilingual children with SLI rely on one language in learning a second one? *Applied Psycholinguistics*, *31*(2), 29-36.

Armon-Lotem, S., Gagarina, N., & Gupol, O. (2007). Developmental variation in the acquisition of L1 Russian verb inflection by monolinguals and bilinguals. Presented at the Electronic supplement to the proceedings of the 31st Annual BUCLD, Cascadilla Press.

Armon-Lotem, S., Gagarina, N., Altman, C., Burstein-Feldman, Z., Gordishevsky, G., Gupol, O., & Walters, J. (2008). Language acquisition as a window to social integration among Russian language minority children in Israel. *Israel Studies in Language and Society*, *1*(1), 155-177.

Audollent, C., & Cornips, L. (2003). La dysphasie : Quelles séquelles en français? *ANAE*, *74-75*, 264-270.

Auger, J. (1994). *Pronominal clitics in Québec French : A morphological analysis.* Doctoral dissertation. Pennsylvania Universtiy, Pennsylvania.

Ayoun, D. (2007). The acquisition of grammatical gender in L2 French. *French Applied Linguistics* (pp. 130-170). Amsterdam: John Benjamins Publishing Company.

Ayoun, D. (2008). *Studies in French applied linguistics*. Amsterdam: John Benjamins Publishing Company.

Bailey, N., Madden, C., & Krashen, S. (1974). Is there a natural sequence in adult second language learning? *Language Learning*, *24*, 235-243.

Ballard, W. S., Tighe, P. L., & Dalton, E. F. (1980). *IDEA Oral Language Proficiency Test I*. Brea, CA: Ballard & Tighe.

Bedore, L., & Leonard, L. B. (1998). Specific language impairment and grammatical morphology: A discriminate function analysis. *Journal of Speech and Hearing Research*, *41*, 1185-1192.

Bedore, L., & Peña, E. (2008). Assessment of bilingual children for identification of language impairment: Current findings and implications for practice. *The International Journal of Bilingual Education and Bilingualism*, *11*(1), 1-29.

Belletti, A. (2008). *Structures and strategies*. London: Routledge.

Belletti, A., & Hamann, C. (2004). On the L2/bilingual acquisition of French by two young children with different source languages. In P. Prévost & J. Paradis (Eds.), *The Acquisition of French in Different Contexts* (pp. 147-174). Amsterdam: John Benjamins Publishing Company.

Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society: Series B, 57*, 289–300.

Bialystok, E., & Miller, B. (1999). The problem of age in second language acquisition: Influences from language, structure and task. *Bilingualism: Language and Cognition, 2*, 127-145.

Bishop, D. (1994). Grammatical errors in specific language impairment: Competence or performance limitations. *Applied Psycholinguistics, 15*, 507-550.

Bishop, D. (2000). Pragmatic language impairment: a correlate of SLI, a distinct subgroup, or part of the autistic continuum? In D. Bishop & L. Leonard (Eds.), *Speech and language impairment in children*. Hove: Psychology Press.

Bishop, D. (2003). *Test for Reception of Grammar, Version 2 (TROG-2)*. London: The Psychological Corporation.

Bishop, D. (2004). Specific language impairment: Diagnostic dilemmas. In L. Verhoeven & H. van Baldom (Eds.), *Classification of developmental language disorders: theoretical issues and clinical implications* (pp. 309-326). Mahwah, NJ: Lawrence Erlbaum Associates.

Bishop, D., & Edmundson, A. (1987). Language-impaired 4-year-olds: Distinguishing transient from persistent impairment. *Journal of Speech and Hearing Disorders, 52*, 156-173.

Bley-Vroman, R. (1990). The logical problem of foreign language learning. *Linguistic Analysis, 20*, 3-49.

Bley-Vroman, R., Gass, S., & Schachter, J. (1989). What is the logical problem of foreign language learning? *Linguistic Perspectives on Second Language Acquisition* (pp. 41-68). New York, NY: CUP.

Blom, E. (2008). Testing the Domain-by-Age Model: Inflection and placement of Dutch verbs. In B. Haznedar & E. Gavruseva (Eds.), *Current Trends in Child Second Language Acquisition. A generative perspective* (pp. 271-300). Amsterdam: John Benjamins Publishing Company.

Blumenthal, M., & Julien, M. (1999). *Anamnese meertaligheid [Questionnaireon the child's multilingual context]*. The Hague: Audiologisch Centrum.

Bortfeld, H., & Whitehurst, G. (2001). Sensitive periods to first language acquisition. In N. Botting, J. Bruer, J. Lichtman, & F. Symons (Eds.), *Critical thinking about critical periods: Perspectives from Biology, Psychology, and Education* (pp. 173-192). Baltimore , MD: Brookes Publishing.

Botting, N. F., & Conti-Ramsden, G. M. (2004). Characteristics of children with specific language impairment. In L. Verhoeven & H. van Balkom (Eds.), *Classification of developmental language disorders* (pp. 22-38). Mahwah, NJ: Lawrence Erlbaum Associates.

Bruhn de Garavito, J., & White, L. (2002). L2 acquisition of Spanish DPs: The status of grammatical features. In A. T. Pérez-Leroux & J. M. Liceras (Eds.), *The Acquisition of Spanish Morphosyntax: The L1/L2 Connection* (pp. 151-176). Dordrecht: Kluwer.

Butterworth, B., Campbell, R. & Howard, D. (1986).The uses of short-term memory: A case study. Quarterly Journal of Experimental Psychology, 38, pp. 705-737.

Carroll, S. E. (1999). Putting “input” in its proper place. *Second Language Research*, *15*(4), 337-388.

Carstens, C. (2000). Remarks and replies. Concord in minimalist theory. *Linguistic Inquiry*, *31*(2), 319-355.

Cazden, C., Cancino, H., Rosansky, E. and Schuman, J. (1975). *Second Language Acquisition Sequences in Children, Adolescents and Adults. Final Report*. Washington, DC: US department of Health, Education and Welfare, National Institute of Education Office of Research Grants.

Chevrie-Muller, C., Simon, A. M., & Decante, P. (1980). *Epreuves pour l’examen de langage*. Paris: Editions du Centre de Psychologie Appliquée.

Chomsky, N. (1995). *The Minimalist Program*. Cambridge, MA: MIT Press.

Chondrogianni, V. (2008). The Acquisition of the D-domain in Child L2 Greek: Effects of age and construction. In B. Haznedar & R. Slabakova (Eds.), *Child L2 Acquisition: A Generative Perspective* (pp. 97-145). Amsterdam: John Benjamins Publishing Company.

Clahsen, H. (1989). The grammatical characterization of dyspahsia. *Linguistics*, *27*, 897–920.

Clahsen, H. (2008). Chomskyan syntactic theory and language disorders. In M. J. Ball, M. Perkins, N. Mueller, & S. Howard (Eds.), *The Handbook of Clinical Linguistics* (pp. 165-183). Oxford: Blackwell.

Clahsen, H., & Felser, C. (2006). Grammatical processing in language learners. *Applied Psycholinguistics*, *27*, 3-42.

Clahsen, H., Bartke, S., & Göllner, S. (1997). Formal features in impaired grammars: a comparison of English and German SLI children. *Journal of Neurolinguistics*, *10*, 151-171.

Clark, E. (1985). The acquisition of Romance with special reference to French. In D. Slobin (Ed.), *In The Cross-linguistic Study of Language Acquisition* (pp. 687-782). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cole, K. N., Dale, P. S., & Mills, P. E. (1990). Defining language delay in young children by cognitive referencing: Are we saying more than we know? *Applied Psycholinguistics*, *11*, 291-302.

Conti-Ramsden, G. M. (2008). Heterogeneity of specific language impairment in adolescent outcomes. *Understanding developmental language disorders: From theory to practice*. Manchester, UK.

Conti-Ramsden, G. M., & Durkin, K. (2008). Language and independence in adolescents with and without a history of specific language impairment (SLI). *Journal of Speech, Language and Hearing Research*, *51*, 70-93.

Corbett, G. G. (1991). *Gender*. Cambridge: Cambridge University Press.

Coveney, A. (1996). *Variability in spoken French*. Exeter: Elm Bank Publications.

Cronel-Ohayon, S. (2004). *Etude longitudinale d'une population d'enfants dysphasiques.* Doctoral dissertation. University of Geneva, Geneva.

Crutchley, A., Conti-Ramsden, G. M., & Botting, N. F. (1997). Bilingualism and specific language impairment in children attending language units. *European Journal of Disorders of Communication, 32*, 267-276.

Crysmann, B., & Bailey, N. (2000). On the non-parallelism in the acquisition ofreflexive and nonreflexiveobject clitics. In S. M. Powers & C. Hamann (Eds.), *The acquisition of scramblingand cliticization* (pp. 207–236). Dordrecht: Kluwer.

Cummins, J. (1994). Knowledge, power and identity in teaching English as a second language. In F Genesee (Ed.), *Educating second language children: The whole child, the whole curriculum, the whole community* (pp. 33-58). New York, NY: Cambridge University Press.

Cummins, J. (2000). *Language, power, and pedagogy: Bilingual children in the crossfire*. Clevedon, UK: Multilingual Matters.

de Agostini, M., Metz-Lutz, M. N., van Hout, A., Chavance, M., Deloche, G., & Pavao-Martins, I. (1998). Oral language evaluation battery of aphasic children (ELOLA): A French standardization (4-12 years). *Revue Neuropsychol, 3*, 319-368.

De Cat, C. (2002). *French dislocation.* Doctoral dissertation. University of York, York, UK.

DeKeyser, R. (2000). The robustness of critical period effects in second language acquisition. *Studies in Second Language Acquisition, 22*, 499-533.

Dekydtspotter, L., Schwartz, B., & Sprouse, R. (2006). The comparative fallacy in L2 processing research. In M. Grantham O'Brien, C. Shea, & J. Archibald (Eds.), *The Banff Conference* (pp. 33-40). Presented at the Proceedings of the 8th Generative Approaches to Second Language Acquisition Conference (GASLA, Somerville, MA: Cascadilla Press.

Delage, H. (2008). *Évolution de l'hétérogénéité linguistique chez les enfants sourds moyens et légers: Étude de la complexité morphosyntaxique.* Doctoral dissertation. Rabelais University, Tours.

Dimroth, C. (2004). *Fokuspartikeln und Informationsgliederung im Deutschen*. Tübingen: Stauffenburg.

Dulay, H., & Burt, M. (1973). Should we teach children syntax? *Language Learning, 23*, 95-123.

Dunn, L. M., Dunn, L. M., Whetton, C., & Burley, J. (1997). *British picture vocabularyscale II*. Windsor, UK: NFER-Nelsoo.

Dunn, M., Flax, J., Sliwinski, M., & Aram, D. M. (1996). The use of spontaneous language measures as criteria for identifying children with specific language impairment : An attempt to reconcile clinical and research congruence. *Journal of Speech and Hearing Research, 39*, 643-654.

Edmonds, J. (1978). The verbal complex V-V' in French. *Linguistic Inquiry, 9*, 49-77.

Eubank, L. (1993). On the transfer of parametric values in L2 development. *Language Acquisition, 3*, 183-208.

Eubank, L. (1994). Optionality and the initial state in L2 development. In T. Hoekstra & B. Schwartz (Eds.), *Language Acquisition Studies in Generative Grammar: Papers in Honor of Kenneth Wexler from the 1991 GLOW Workshops* (pp. 369–388). Philadelphia, PA: John Benjamins Publishing Company.

Ferdinand, A. (1996). *The acquisition of the subject in French.* Doctoral dissertation. HIL/Leiden University, Leiden.

Fonagy, I. (1985). J'aime. Je connais. Verbes transitifs à objet latent. *Revue Romane*, *20*, 3-35.

Friedmann, N., Belletti, A., & Rizzi, L. (2009). Relativized relatives: Types of intervention in theacquisition of A-bar dependencies. *Lingua*, *119*, 67-88.

Gass, S., & Selinker, K. (2001). *Second language acquisition. An introductory course*. Mahwah, NJ: Lawrence Erlbaum Associates.

Gathercole, S. E. (2002). Memory development during the childhood year. In A. D. Baddeley, M. D. Kopelman, & B. A. Wilson (Eds.), *Handbook of memory disorders (2nd edn)* (pp. 475-500). Wiley.

Gathercole, S. E., & Baddeley, A. D. (1990). Phonological memory deficits in language disordered children: Is there a causal connection? *Journal of Memory & Language*, *29*, 336-360.

Gathercole, S. E., & Baddeley, A. D. (1993). Phonological working memory: A critical building block for reading development and vocabulary acquisition? *European Journal of the Psychology of Education*, *8*, 259-272.

Gathercole, S. E., & Pickering, S. J. (2000). Assessment of working memory in six- and seven-year old children. *Journal of Educational Psychology*, *92*, 377-390.

Gavruseva, E. (2008). The development of copula and auxiliary be and overgeneration of be in child L2 English. In E. Gavruseva & B. Haznedar (Eds.), *Current Trends in Child Second Language Acquisition. A generative perspective* (pp. 145–175). Amsterdam: John Benjamins Publishing Company.

Gavruseva, E, & Lardière, D. (1996). The emergence of extended phrase structure in child L2 acquisition. In Stringfellow & al. (Ed.), *BUCLD 20 Proceedings* (pp. 225-236). Somerville, MA: Cascadilla Press.

Geçkin, V., & Haznedar, B. (2008). The morphology/syntax interface in child L2 acquisition: Evidence from verbal morphology. In E. Gavruseva & B. Haznedar (Eds.), *Current Trends in Child Second Language Acquisition. A generative perspective* (pp. 237-270). Amsterdam: John Benjamins Publishing Company.

Gibson, E. (1998). Linguistic complexity: Locality of syntactic dependencies. *Cognition*, *68*, 1-76.

Gillam, R. B., & Johnston, J. R. (1992). Spoken and written language relationships in language/learning-impaired and normally achieving school-age children. *Journal of Speech and Hearing Research, 35*, 1303–1315.

Gopnik, M. (1990a). Feature-blind grammar and dysphasia. *Nature*, 344-715.

Gopnik, M. (1990b). Feature blindness: A case study. *Language Acquisition*, *1*, 139-164.

Gopnik, M., & Crago, M. (1991). Familial aggregation of a developmental language disorder. *Cognition*, *39*, 1-50.

Goralnik, E. (1995). *Goralnik diagnostic test*. Even Yehuda, Israel: Matan.

Granfeldt, J. (2003). *L'Acquisition des Catégories Fonctionnelles. Étude comparative du développement du DP français chez des enfants et des apprenants adultes.* Doctoral dissertation. Institut d'Etudes romanes de Lund, Université de Lund, Lund.

Granfeldt, J., Schlyter, S., & Kihlstedt, M. (2007). French as cL2, 2L1 and L1 in pre-school children. *PERLES : petites études romanes de Lund. Extra seriem : commentaires & communications, 21*, 6-43.

Grinstead, J. (1994). *Consequences of the maturation of number morphology in Spanish and Catalan.* M.A.thesis, UCLA.

Grondin, N., & White, L. (1996). Functional categories in child L2 acquisition of French. *Language Acquisition*, *5*, 1-34.

Grüter, T. (2005). Comprehension and production of French object clitics by child second language learners and children with specific language impairment. *Applied Psycholinguistics*, *26*, 363-391.

Grüter, T. (2006). *Object clitics and null objects in the acquisition of French.* Doctoral dissertation. McGill University.

Guasti, M. T. (1994). Verb syntax in Italian child grammar: Finite and nonfinite verbs. *Language Acquisition*, *3*(1), 1-40.

Guasti, M. T. (2002). *Language acquisition: The growth of grammar*. Cambridge, MA: MIT Press.

Guillelmon, D., & Grosjean, F. (2001). The gender marking effect in spokenword recognition: The case of bilinguals. *Memory & Cognition*, *29*(3), 503-511.

Gutierrez-Clellen, V. F., & Hoffstetter, R. (1994). Syntactic complexity in Spanish narratives: A developmental study. *Journal of Speech and Hearing Research*, *37*, 645-654.

Gutierrez-Clellen, V. F., & Kreiter, J. (2003). Understanding child bilingual acquisition using parent and teacher reports. *Applied Psycholinguistics*, *24*(2), 267-288.

Gutierrez-Clellen, V. F., Simon-Cereijido, G., & Wagner, C. (2008). Bilingual children with language impairment: A comparison with monolinguals and second language learners. *Applied Psycholinguistics*, *29*, 3–20.

Haiden, M. (2011). *La prédication* (Habilitation à diriger des recherches). Rabelais University, Tours.

Håkansson, G. (2001). Against full transfer: Evidence from Swedish learners of German. *Working Papers*, *48*, 67-86.

Håkansson, G., & Nettelbladt, U. (1993). Developmental sequences in L1 (normal and impaired) and L2 acquisition of Swedish. *International Journal of Applied Linguistics*, *3*, 131-157.

Håkansson, G., & Nettelbladt, U. (1996). Similarities between SLI and L2 children. Evidence from the acquisition of Swedish word order. In J. Gilbert & C. Johnson (Eds.), *Children's Language Vol 9*, Vol 9 (pp. 135-151). Mahwah, New Jersey: Lawrence Erlbaum Associates.

Hakuta, K. (2001). A critical period for second language acquisition? In N. Bailey, J. Bruer, J. Lichtman, & F. Symons (Eds.), *Critical Thinking about Critical Periods* (pp. 193-205). Baltimore , MD: Paul Brookes Publishing Co.

Hakuta, K., Goto Butler, Y., & Witt, D. (2000). How long does it take English learners to attain proficiency? *Policy Report for The University of California Linguistic Minority Research Institute*, *1*.

Halle, M., & Marantz, A. (1993). Distributed morphology and the pieces of inflection. In K. Hale & S. J. Keyser (Eds.), *The View from Building 20* (pp. 111–176). Cambridge: MIT Press.

Hamann, C. (2003). Phenomena in French normal and impaired language development and their implications for theories of development. *Probus*, *15*, 89-120.

Hamann, C. (2006). Speculations about early syntax: The production of Wh-questions by normally developing French children and French children with SLI. *Catalan Journal of Linguistics*, *5*, 143-189.

Hamann, C, Ohayon, S., Dubé, S., Frauenfelder, U., Rizzi, L., Strarke, M., & Zesiger, P. (2003). Aspects of grammatical development in young French children with SLI. *Developmental Science*, *6*, 151-158.

Hamann, C., Rizzi, L., & Frauenfelder, U. (1996). On the acquisition of subject and object clitics inFrench. In H. Clahsen (Ed.), *Generative perspectives on language acquisition* (pp. 390-334). Amsterdam: John Benjamins Publishing Company.

Hamann, C., Tuller, L., Monjauze, C., Delage, H., & Henry, C. (2007). (Un)successful subordination in French-speaking children and adolescents with SLI. In H. Caunt-Nutton, S. Kulatilake, & I. Woo (Eds.), . Presented at the Proceedings of BUCLD 31, Somerville, MA: Cascadilla Press.

Hawkins, R. (2001). *Second language syntax: A generative introduction*. Oxford: Blackwell.

Hawkins, R., & Franceschina, F. (2004). Explaining the acquisition and non-acquisition of determiner-noun gender concord in French and Spanish. In P. Prévost & J. Paradis (Eds.), *The Acquisition of French in Different Contexts: Focus on Functional Categories* (pp. 175-206). Amsterdam: John Benjamins Publishing Company.

Hawkins, R., & Yuet-hung Chan, C. (1997). The partial availability of universal grammar in second language acquisition: The failed functional features hypothesis. *Second Language Research*, *13*, 187-226.

Haznedar, B. (1997). L2 acquisition by a Turkish-speaking child: Evidence of L1 influence. In E. Hughes, M. Hughes, & A. Greenhill (Eds.), *Proceedings of the 21st Boston University*. Presented at the Conference on Language Development, Somerville, MA: Cascadilla Press.

Haznedar, B. (2001). The acquisition of the IPsystem in child L2 English. *Studies in Second Language Acquisition, 23*, 1-39.

Haznedar, B. (2003). The status of functional categories in child second language acquisition: Evidence from the acquisition of CP. *Second Language Research*, *19*(1), 1-41.

Hoekstra, T., & Hyams, N. (1998). Aspects of root infinitives. *Lingua*, *106*, 81-112.

Hulk, A. C. J. (2000). L'acquisition des pronoms clitiques en Français par un enfant bilingue Français Néerlandais. *Canadian Journal of Linguistics, 45,* 97-117.

Hulk, A. C. J. (2007). Deviance in early child bilingualism. In J. Camacho, N. Flores-Ferrán, L. Sánchez, V. Déprez, & M. . Cabrera (Eds.), *Romance Linguistics 2006. Selected papers from the 26th Linguistic Symposium on Romance Languages (LSRL)* (pp. 177-198). Amsterdam: John Benjamins Publishing Company.

Hulk, A. C. J., & Cornips, L. (2006). Between 2L1 - and child L2 acquisition: An experimental study of bilingual Dutch. *Interfaces in Multilingualism: Acquisition, representation and processing* (Vol. 4). Amsterdam: John Benjamins Publishing Company.

Hulk, A. C. J., & Zuckerman, S. (2000). The Interaction between input and economy: Acquiring optionality in French wh-questions. In S. Catherine Howell (Ed.), (pp. 438-449). Presented at the BUCLD 24 Proceedings, Somerville, MA: Cascadilla Press.

Hunt, K. W. (1965). *Grammatical structures written at three grade levels*. Champaigne, IL: National Council of Teachers of English.

Hunt, K. W. (1977). Early blooming and late blooming syntactic structures. In C. R. Cooper & L. Odell (Eds.), *Evaluating writing: Describing, measuring, judging*. Urbana, IL: National Council of Teachers of English.

Ionin, T., & Wexler, K. (2002). Why is "is" easier than "-s"?: Acquisition of tense/agreement morphology by child second language learners of English. *Second Language Research*, *18*(2), 95-136.

Jakubowicz, C. (2003). Hypothèses psycholinguistiques sur la nature du deficit dysphasique. In C. L. Gérard & V. Brun (Eds.), *Les dysphasies* (pp. 23-70). Paris: Masson.

Jakubowicz, C. (2004). *Is movement costly ? The grammar and the processor in Language acquisition*. Communication orale présentée au JEL de Nantes, France.

Jakubowicz, C. (2005). The language faculty: (Ab)normal development and interface constraints. Presented at the GALA.

Jakubowicz, C. (2007). Grammaire universelle et trouble spécifique du langage. In J. Brimond & J. Franck (Eds.), *Noam Chomsky. Cahiers de l'Herne* (pp. 164-175).

Jakubowicz, C. (2011). Measuring derivational complexity: New evidence from typically developing and SLI learners of L1 French. *Lingua*, *121*(3), 339-351. doi:10.1016/j.lingua.2010.10.006

Jakubowicz, C., & al. (1996). On the acquisition of the pronominal system in French and German. In A. Springfellow & and al. (Eds.), *Proceedings of the 20th Annual Boston University Conference on Language Development* (pp. 374-385). Presented at the BUCLD, Somerville, MA: Cascadilla Press.

Jakubowicz, C., & Nash, L. (1999). Determiners and clitic pronouns in French-speaking children with SLI. *Language Acquisition, Special Issue on SLI, Kluwer, Dordrecht*, *7*(2-4), 113-160.

Jakubowicz, C., & Nash, L. (2001). Functional categories and syntactic operations in(ab)normal language acquisition. *Language*, *77*, 321-339.

Jakubowicz, C., & Rigaut, C. (2000). L'acquisition des clitiques nominatifs en Français. *Revue Canadienne de Linguistique, Special issue on Language Acquisition*, *45*(1-2), 119-157.

Jakubowicz, C., & Tuller, L. (2008). *Specific language impairment in French*. (D. Ayoun, Ed.). Amsterdam: John Benjamins Publishing Company.

Jakubowicz, C., Nash, L., Rigaut, C., & Gerard. (1998). Determiners and clitic pronouns in French-speaking children with SLI. *Language Acquisition*, *7*(2-4), 113-160.

Jakubowicz, C., Tuller, L., & Rigaut, C. (1999). Phonologically weak items in abnormal acquisition of French. *Proceedings of the Annual Boston University* (Vol. 2, pp. 482-494). Presented at the Conference on Language Development, 24(2), Somerville, MA: Cascadilla Press.

Jia, G., & Fuse, A. (2007). Acquisition of english grammatical morphology by native Mandarin-speaking children and adolescents: Age-related differences. *Journal of Speech, Language, and Hearing Research*, *50*, 1280–1299.

Johnson, J. S., & Newport, E. L. (1989). Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. *Cognitive Psychology*, *21*, 60-99.

Jones, M. A. (1996). *Foundations of French syntax*. New York, NY: Cambridge University Press.

Kail, R. (1994). A method for studying the generalized slowing hypothesis in children with specific language impairment. *Journal of Speech and Hearing Research*, *37*(2), 418-21.

Karmiloff-Smith, A. (1979). *A functional approach to child language*. Cambridge: Cambridge University Press.

Kayne, R. (1975). *French syntax. The transformational cycle*. Cambridge, MA: MIT Press.

Khomsi, A. (2001). *Evaluation du langage oral*. Paris: Editions du Centre de psychologie appliquée.

Khomsi, A., & Nanty, I. (2001). *Evaluation des compétences langagières au collège (ECL-C)*. Paris: ECPA.

Khomsi, A., Khomsi, J., Pasquet, F., & Parbeau-Gueno, A. (2007). *Bilan Informatisé de langage Oral au cycle III et au Collège (BILO3C)*. Paris: Centre de psychologie appliquée.

Klingner, J. K., & Artiles, A. J. (2003). When should bilingual students be in special education? *Educational Leadership, 61*(2), 66–71.

Kohl, M., Beauquier-Maccota, B., Bourgeois, M., Clouard, C., Donde, S., Mosser, A., Pinot, P., et al. (2008). Bilinguisme et troubles du langage chez l'enfant : Etude rétrospective. *La psychiatrie de l'enfant*, *51*, 577-595.

Kohnert, K. (2008). *Language disorders in bilingualchildren and adults*. San Diego, CA: Plural Publishing.

Kohnert, K., & Bates, E. (2002). Balancing bilinguals II: Lexical comprehension and cognitive processing in children learning Spanish and English. *Journal of Speech, Language, and Hearing Research, 45,* 347–359.

Kohnert, K., Windsor, J., & Danahy Ebert, K. (2009). Primary or "specific" language impairment and children learning a second language. *Brain and Language*, *190*(2-3), 101-111.

Lahey, M. (1990). Who shall be called language disordered? Some reflections and one perspective. *Journal of Speech and Hearing Disorders*, *55*, 612-620.

Lakshmanan, U. (1991). Morphological uniformity and null subjects in child second language acquisition. In L. Eubank (Ed.), *Point counterpoint: Universal Grammar in the second language* (pp. 389- 410). Amsterdam: John Benjamins Publishing Company.

Lakshmanan, U., & Selinker, L. (1994). The status of CP and the tensed complementizer that in the developing L2 grammars of English. *Second Language Research*, *10*, 25-48.

Lardière, D. (1998). Dissociating syntax from morphology in a divergent L2 end-state grammar. *Second Language Research*, *14*, 359-375.

Larson-Hall, J. (2010). *A guide to doing statistics in second language research using SPSS*. New York, NY: Routledge.

Lee, R. R. (2001). Dialect perception: A critical review and re-evaluation. *Quarterly Journal of Speech*, *57*, 410-417.

Lefebvre, C. (1987). Some problems in defining syntactic variables: The case of whquestions in Montreal French. In R. Fasold & D. Schiffrin (Eds.), *Language change and variation*. Amsterdam: John Benjamins Publishing Company.

Lemoine, K. (1997). *The grammar of null complementation in spoken French.* Doctoral dissertation. University of Texas, Austin.

Lenneberg, E. (1967). *Biological foundations of language* (Wiley.).

Lenneberg, E. (1976). *Neuropsychology of language*. New York, NY: Plenum Press.

Leonard, L.B. (1998). *Children with Specific Language Impairment*. Cambridge, MA: MIT Press.

Leonard, L.B. (2000). Specific language impairment across languages. In V.M. Bishop and L.B. Leonard, Speech and Language Impairments in Children: Causes, Characteristics, Intervention and Outcome (pp. 115-129). East Sussex: Psychology Press.

Loban, W. (1976). *Language development : Kindergarten through grade twelve*. Urbana, IL: National Council of Teachers of English.

MacWhinney, B. (2000). *The CHILDES project: Tools for analyzing talk* (Third Edition.). Mahwah, NJ: Lawrence Erlbaum Associates.

Maillart, C. (2003). *Origine des troubles morphosyntaxiques chez des enfants dysphasiques* (Unpublished Doctoral dissertation). Université catholique de Louvain, Louvain.

Makino, T. (1980). Acquisition order of English morphemes by Japanese secondary school students. *Journal of Hokkaido University of Education*, *30*(2), 101-148.

Malvern, D., & Richards, B. (2004). Investigating the validity of a new measure of lexical diversity for root and inflected forms. In S. Dobbinson, P. Griffiths, & K. Trott (Eds.), *The child language reader* (pp. 81-89). London: Routledge.

Marchman, V., Martinez-Sussman, C., & Dale, P. S. (2004). The language-specific nature of grammatical development: Evidence from bilingual language learners. *Developmental Science*, *7*, 212–224.

Marelj, M. (2004). *Middles and argument structure across languages*. Utrecht University, Utrecht.

Marinellie, S. A. (2004). Complex syntax used by school-age children with specificlanguage impairment (SLI) in child-adult conversation. *Journal of Communication Disorders*, *37*, 517-533.

Marinis, T. (2007). On-line processing of passives in L1 and L2 children. In A. Belikova, L. Meroni, & M. Umeda (Eds.), *Proceedings of the 2nd Conference on Generative Approaches to Language Acquisition North America* (pp. 265-276). Presented at the GALANA, Somerville, MA: Cascadilla Press.

Marinis, T., & Chondrogianni, V. (2010). Production of tense marking in successive bilingual children: When do they converge with their monolingual peers? *International Journal of Speech-Language Pathology*, *12*, 19-28.

Marinis, T., & van der Lely, H. K. J. (2007). On-line processing of wh-questions in children with G-SLI and typically developing children. *International Journal of Language & Communication Disorders*, *42*(5), 557-582.

Marshall, C. R., & van der Lely, H. K. J. (2007). Passive verb morphology: The effect of phonotactics on passive comprehension in typically developing and Grammatical-SLI children. *Lingua*, *117*, 1434-1447.

Mayer, M. (1969). *Frog, where are you?* New York, NY: Puffin Pied Piper.

Mayer, M., & Mayer, M. (1975). *One frog too many*. New York, NY: Puffin Pied Piper.

Meisel, J. (1990). *Two first languages : Early grammatical development in bilingual children*. Studies on language acquisition ; 10. Dordrecht, Holland: Foris Publications.

Meisel, J. (2008). Child second language acquisition or successive first language acquisition? In Belma Haznedar & E. Gavruseva (Eds.), *Current Trends in Child Second Language Acquisition. A generative perspective* (pp. 55-80).

Meisel, J. (2009). Second language acquisition in early childhood. *Zeitschrift für Sprachwissenschaft, 28*(1), 5-34.

Miller, C. A., Leonard, L. B., & Finneran, D. (2008). Grammaticality judgements in adolescents with and without language impairment. *International Journal of Language and Communication Disorders*, *43*(3), 346–360.

Möhring, A. (2001). The acquisition of French by German pre-school children. An empirical investigation of gender assignment and gender agreement. In S. Foster-Cohen & A. Nizegorodcew (Eds.), *EUROSLA Yearbook* (Vol. 1, pp. 171-193). Amsterdam: John Benjamins Publishing Company.

Monjauze, C. (2007). *Langage et épilepsie à pointes centro-temporales :Déficits et séquelles.* Doctoral dissertation. Rabelais University, Tours.

Montrul, S. (2008a). How similar are adult second language learners and Spanish heritage speakers? Spanish clitics and word order. *Applied Psycholinguistics*, *31*(1), 167–207.

Montrul, S. (2008b). *Incomplete acquisition in Bilingualism*: *Re-examining the age factor*. Amsterdam: John Benjamins Publishing Company.

Montrul, S., & Slabakova, R. (2003). Competence similarities between native and near-native speakers: An investigation of the preterite/imperfect contrast in Spanish. *Studies in Second Language Acquisition*, *25*(3), 351-398.

Oiry, M. (2011). A case of true optionality: Wh-in-situ patterns like long movement in French in the optionality of Wh-movement. In A. Roussou & C. Vlachos (Eds.) *Linguistic Analysis*, *37*(1-2), 112-136.

Orgassa, A. (2009). *Specific language impairment in a bilingual context: The acquisition of Dutch by Turkish–Dutch learners.* Doctoral Dissertation. University of Utrecht, Utrecht: LOT

Orgassa, A., & Weerman, F. (2008). Dutch gender in specific language impairment and second language acquisition. *Second Language Research*, *24*(3), 333-364.

Owen, A. J., & Leonard, L. B. (2006). The production of finite and nonfinite complement clauses by children with specific language impairment and their typically developing peers. *Journal of Speech Language and Hearing Research*, *49,* 548-571.

Paradis, J. (2004). The relevance of specific language impairment in understanding the role of transfer in second language acquisition. *Applied Psycholinguistics*, *25*, 67–82.

Paradis, J. (2005). Grammatical morphology in children learning English as a second language: Implications of similarities with Specific Language Impairment. *Language, Speech and Hearing Services in the Schools, 36*, 172-187.

Paradis, J. (2008). Tense as a clinical marker in English L2 acquisition with language delay/impairment. In E. Blom & B. Haznedar (Eds.), *Current Trends in Child Second Language Acquisition. A generative perspective* (pp. 337-356). Amsterdam: John Benjamins Publishing Company.

Paradis, J. (2010a). Bilingual children's acquisition of English verb morphology: Effects of language dominance, structure difficulty, and task type. *Language Learning*, *60*, 651-680.

Paradis, J. (2010b). The interface between bilingual development and specific language impairment. *Applied Psycholinguistics*, *31*, 119-136.

Paradis, J., & Crago, M. (2000). Tense and temporality: Similarities and differences between language-impaired and second-language children. *Journal of Speech, Language and Hearing Research*, *43*(4), 834-848.

Paradis, J., & Crago, M. (2001). The morphosyntax of specific language impairment in French: Evidence for an extended optional default account. *Language Acquisition*, *9*(4), 269-300.

Paradis, J., & Crago, M. (2003). Two of a kind? The Importance of commonalities and variation across languages and Learners. In Y. Levy & J. Schaeffer (Eds.), *Language Competence Across Populations: Toward a definition of specific language impairment*. Mahwah, NJ: Lawrence Erlbaum Associates.

Paradis, J., & Crago, M. (2004). Comparing L2 and SLI grammars in child French: Focus on DP. In P. Prévost & J. Paradis (Eds.), *The acquisition of French in different contexts: Focus on functional categories* (pp. 89-107). Amsterdam: John Benjamins Publishing Company.

Paradis, J., Crago, M., & Genesee, F. (2005). Domain-general versus domain-specific accounts of Specific Language Impairment: Evidence from bilingual children' acquisition of object pronouns. *Language Acquisition*, *13*(1), 33-62.

Paradis, J., Crago, M., Genesee, F., & Rice, M. (2003). Bilingual children with specific language impairment: How do they compare with their monolingual peers? *Journal of Speech, Language and Hearing Research, 46*, 1-15.

Paradis, J., Genesee, F., & Crago, M. (2011). *Dual language development and disorders: A handbook on bilingualism and second language learning (2nd Edition)*. Baltimore , MD: Brookes Publishing.

Paradis, J., Le Corre, M., & Genesee, F. (1998). The emergence of tense and agreement in child L2 French. *Second Language Research, 14*(3), 227-256.

Paradis, J., Rice, M., Crago, M., & Marquis, J. (2008). The acquisition of tense in English: Distinguishing child L2 from L1 and SLI. *Applied Psycholinguistics, 29*, 1-34.

Pearson, B. Z. (2002). Narrative competence in bilingual school children in Miami. In D. K. Oller & R. E. Eilers (Eds.), *Language and Literacy in Bilingual Children. Child Language and Child Development* (pp. 135-174). Clevedon, UK: Multilingual Matters.

Peets, K., & Bialystok, E. (2010). An integrated approach to the study of specific language impairment and bilingualism. *Applied Psycholinguistics, 31*(2).

Peña, E., Gutierrez-Clellen, V. F., Iglesias, A., Goldstein, B., & Bedore, L. (2007). *Bilingual English Spanish assessment*.

Penfield, W., & Roberts, L. (1959). *Speech and brain mechanisms*. Princeton: Princeton University Press.

Pérez-Leroux, A., Pirvulescu, M., & Roberge, Y. (2008). Null objects in child language:Syntax and the lexicon. *Lingua, 118*, 370-398.

Pesetsky, D. (1982). *Paths and categories.* Doctoral dissertation. MIT, Cambridge, MA.

Pienemann, M. (1998a). *Language processing and second language development: Processability theory*. Amsterdam: John Benjamins Publishing Company.

Pienemann, M. (1998b). Developmental Dynamics in L1 and L2 Acquisition: Processability Theory and Generatice Entrenchment. *Bilingualism: Language and Cognition 1.1* (pp. 1-20).

Pierce, A. (1989). *On the emergence of syntax: A cross-linguistic study*. Doctoral dissertation. MIT.

Pierce, A. (1992). *Language acquisition and syntactic theory: A comparative analysis of French and English child grammars*. Dordrecht: Kluwer.

Pizzioli, F., & Schelstraete, M. A. (2008). The argument-structure complexity effect in children with specific language impairment: Evidence from the use of grammatical morphemes in French. *Journal of Speech, Language, and Hearing Research, 51*(3), 706-721.

Plante, E. (1998). Criteria for sli: The Stark and Tallallegacy and beyond. *Journal of Speech, Language, and Hearing Research, 41*, 951-957.

Pollock, J.-Y. (1989). Verb movement, UG and the structure of IP. *Linguistic Inquiry, 20*, 365-424.

Prévost, P. (2009). *The acquisition of French: The development of inflectional morphology and syntax in L1 acquisition, bilingualism and L2 acquisition*. Amsterdam: John Benjamins Publishing Company.

Prévost, P., & White, L. (2000). Missing surface inflection or impairment in second language acquisition? Evidence from tense and agreement. *Second Language Research, 16*(2), 103-133.

Prévost, P., Morin, E., & Tuller, L. (2011). *The effect of computational complexity on the production of errors in wh-questions used by children with SLI and L2 children learning French*. Presented at the 12th International Congress for the Study of Child Language, Université du Québec à Montréal,CA (UQÀM).

Prévost, P., Tuller, L., Scheidnes, M., Ferré, S., & Haiden, M. (2010). Computational Complexity Effects in the Acquisition of Wh-Questions in Child L2 French. In L. Dominguez & P.

Guijarres-Fuentes (Eds.), . Presented at the Selected Proceedings of the Romance Turn III, Newcastle: Cambridge Scholars Publishing.

Rasetti, L. (2003). *Optional categories in early French syntax:A developmental study of root infinitives and null argument.* Doctoral dissertation. University of Geneva, Geneva.

Reed, V. A. (2005). Adolescents with Language Impairment. In V. A. Reed (Ed.), *An Introduction to Children with Language Disorders* (p. chapter 5). Boston, MA: Pearson Press.

Reilly, J., Losh, M., Bellugi, U., & Wulfeck, B. (2004). “Frog, Where are you?”Narratives in children with specific language impairment, early focal brain injury, andWilliams syndrome. *Brain and Language, 88*, 229-247.

Reinhart, T., & Siloni, T. (2005). The lexicon-syntax parameter: Reflexivization and other arity operations. *Linguistic Inquiry, 36*(3), 389-436.

Restrepo, M. A., & Kruth, K. (2000). Grammatical characteristics of a Spanish–English bilingual child with specific language impairment. *Communication Disorders Quarterly, 21*, 66–76.

Restrepo, M. A. (1998). Identifiers of predominantly Spanish-speaking children with language impairment. *Journal of Speech, Language, and Hearing Research, 41*, 1398-1411.

Rice, M., & Wexler, K. (1996). Toward tense as a clinical marker for specific language impairment inEnglish-speaking children. *Journal of Spech and Hearing Research, 39*, 1239-1257.

Rice, M., & Wexler, K. (2001). *Rice/Wexler Test of Early Grammatical Impairment*. San Antonio, TX: The Psychological Corporation.

Rice, M., Mabel, L., Hoffman, L., & Wexler, K. (2009). Judgments of omitted BE and DO in questions as extended finiteness clinical markers of SLI to fifteen years: A study of growth and asymptote. *Journal of Speech and Hearing Research*, *52*, 1417-1433.

Rice, M., Wexler, K., & Cleave, P. L. (1995). Specific language impairment as a period of extended optional infinitive. *Journal of Speech and Hearing Research, 38*(4), 850-863.

Rizzi, L. (1990). *Relativized Minimality*. Cambridge, MA: MIT Press.

Rizzi, L. (1993). Some notes on linguistic theory and language development: The case of root infinitives. *Language Acquisition, 3*(4), 371-393.

Rizzi, L. (1994). Early null subjects and root null subjects. In T. Hoekstra & B. Schwartz (Eds.), *Language Acquisition Studies in Generative Grammar: Papers in Honor of Kenneth Wexler from the 1991 GLOW Workshops* (pp. 151-176). Amsterdam: John Benjamins Publishing Company.

Rizzi, L. (2000). Remarks on early null subjects. In N. Friedmann & L. Rizzi (Eds.), *The Acquisition of Syntax* (pp. 269-292). London: Longman.

Rizzi, L. (2002). *Handbook of comparative syntax*. In G. Cinque & R. Kayne (Eds.). New York, NY: Oxford University Press.

Roberge, Y. (1990). *The syntactic recoverability of null arguments*. Kingston: McGill-Queen's University Press.

Rondal, J. A. (1999). Le langage oral. In J. A. Rondal & X. Seron (Eds.), *Troubles du langage, bases théoriques, diagnostic et rééducation* (pp. 395-412). Bruxelles: Mardaga.

Rosenthal, R., & Rosnow, R. L. (1985). *Contrast analysis: Focused comparisons in the analysis of variance*. Cambridge, UK: Cambridge University Press.

Roulet, L. (2007). L'accord grammatical de genre dans la dysphasie de développement. *Psychologie française*, *52*, 55-70.

Salameh, E.-K., Nettelbladt, U., Conti-Ramsden, G. M., & Gullberg, B. (2002). Language impairment in Swedish bilingual children: A comparison between bilingual and monolingual children in Malmo. *Acta Paediatrica*, *91*, 229-234.

Saunders, W., & O'Brien, G. (2006). Oral language. In F. Genesee, K. Lindholm-Leary, W. Saunders, & D. Christian (Eds.), *Educating english language learners: A synthesis of empirical evidence* (pp. 24-97). New York, NY: Cambridge University Press.

Schaeffer, J. C. (1990). *The syntax of the subject in child language: Italian compared to Dutch.* Doctoral dissertation. University of Utrecht, Utrecht.

Schlichting, J. E. P. T. (2006). *Lexiconlijsten Marokkaans-Arabisch, Tarifit-Berbers en Turks [Vocabulary lists of Morrocan-Arabic, Tarifit-Berber and Turkish]*. Amsterdam: JIP.

Schwartz, B. (1999). Some specs on specs in L2 acquisition. In D. Adger, S. Pintzuk, B. Haznedar, & G. Tsoulas (Eds.), *Specifiers: Minimalist Approaches* (pp. 299-337). Oxford: Oxford University Press.

Schwartz, B. (2003). Child L2 acquisition: Paving the way. In B. Beachley, A. Brown, & F. Conlin (Eds.), *The 27th Annual Boston University* (Vol. 1, pp. 26-50). Presented at the Language Development, Somerville, MA: Cascadilla Press.

Schwartz, B. (2004). Why child L2 acquisition? *Proceedings of GALA 2003* (Vol. 1, pp. 47-66). Presented at the Gala, Utrecht: Netherlands Graduate School of Linguistics (LOT).

Schwartz, B., & Sprouse, R. (1994). Word order and nominative case in nonnative language acquisition: A longitudinal study of (L1 Turkish) German interlanguage. In T. Hoekstra & B. Schwartz (Eds.), *Language Acquisition Studies in Generative Grammar: Papers in Honor of Kenneth Wexler from the 1991 GLOW Workshops* (pp. 317-368). Amsterdam: John Benjamins Publishing Company.

Schwartz, B., & Sprouse, R. (1996a). L2 cognitive states and the full transfer/full access model. *Second Language Research*, *12*, pp. 40-72.

Schwartz, B., & Sprouse, R. (1996b). L2 cognitive states and the full transfer/full access model. *Second Language Research*, *12*, 40-72.

Scott, C. (1988). Spoken and written syntax. In M. Nippold (Ed.), *Later language development* (pp. 49-96). Boston, MA: College-Hill Press.

Scott, C. (2003). *Language as a variety: An analysis of clausal connectivity in spoken and written language of children with language learning disabilities*. Oral communication presented at the SRCLD, Madison, WI.

Scott, C. (2004). Syntactic ability in children and adolescents with language and learning disabilities. In R. Berman (Ed.), *Language development across childhood and adolescence* (pp. 111-134). Cambridge: John Benjamins Publishing Company.

Scott, C., & Stokes, S. (1995). Measures of syntax in school-age children and adolescents. *Language, Speech, and Hearing Services in the Schools, 26*, 309-319.

Scott, C., & Windsor, J. (2000). General language performance measures in spoken and written narrative and expository discourse of school-age children with language learning disabilities. *Journal of Speech, Language, and Hearing Research, 43*, 324-339.

Scovel, T. (1988). *A time to speak: A psycholinguistic inquiry into the critical period for human speech*. New York, NY: Newbury House Publishers.

Séguin, H. (1969). *Les marques du genre dans le lexique de Français écrit contemporain: Compilation des cas et essai de classement*. Unpublished Masters Thesis. Montreal University, Montreal, QC.

Semel, E., Wiig, E., & Secord, W. (2006). *Clinical Evaluation of Language Fundamentals (CELF4-UK)* (Fourth UK Edition.). London: Harcourt Assessment.

Simón-Cereijido, G., & Gutierrez-Clellen, V. F. (2007). Spontaneous language markers of Spanish language impairment. *Applied Psycholinguistics, 28*, 317–339.

Soares, C. (2006). *La Syntaxe de la périphérie gauche en Portugais Européen et son acquisition*. Université Paris 8, Saint-Denis.

Sportiche, D. (1992). Clitic constructions. In J. Rooryck & L. Zaring (Eds.), *Phrase Structure and the Lexicon*. Bloomington, IN: IULC Press.

Stark, R., & Tallal, P. (1981). Selection of children with specific language deficits. *Journal of Speech and Hearing Disorders, 46*, 114 – 122.

Stevens, G. (2006a). The age-length-onset problem in research on second language acquisitionamong immigrants. *Language Learning, 56*(4), 671–692.

Strik, N. (2008). *Syntaxe et acquisition des phrases interrogatives en Français et en Néerlandais : Une étude contrastive.* Doctoral dissertation. Université Paris 8, Saint-Denis.

Stromswold, K. (1998). The genetics of spoken language disorders. *Human Biology, 70*, 297-324.

Stromswold, K. (2001). The heritability of language: A review and meta-analysis of twin, adoption and linkage studies. *Language, 77*, 647-723.

Thordardottir, E., Kehayia, E., Lessard, N., Sutton, A., & Trudeau, N. (2010). Typical performance on tests of language knowledge and language processing of French-speaking 5-year-olds. *Canadian Journal of Speech Language Pathology and Audiology*, *34*, 5-16.

Tomblin, J. B., Records, N., Buckwalter, P., Zhang, X., Smith, E., & O'Brien, M. (1997). Prevalence of specific language impairment in kindergarten children. *Journal of Speech Language and Hearing Research*, *4*, 1245-1269.

Tomblin, J. B. (2008). Validating diagnostic standards for SLI using adolescent outcomes. In C. F. Norbury, J. B. Tomblin, & D. V. M. Bishop (Eds.), *Understanding developmental language disorders: From theory to practice* (pp. 93-114). New York, NY: Psychology Press.

Tomblin, J. B., Freese, P., & Records, N. (1992). Diagnosing specific language impairment in adults for the purpose of pedigree analysis. *Journal of Speech and Hearing Research*, *35*, 832-843.

Torrens, V. (1992). *The acquisition of inflection in Catalan and Spanish*. Talk, Psycholinguistics Lab, UCLA.

Trauner, D., Wulfeck, B., Tallal, P., & Hesselink, J. (2000). Neurological and MRI profiles of children with developmental language impairment. *Developmental Medicine and Child Neurology*, *42*, 470-475.

Tucker, G.R. (1998). A global perspective on multilingualism and multilingual education. In J.Cenoz and Fred Genesee (eds.), Beyond bilingualism: Multilingualism and multilingual education. Clevedon, England: Multilingual Matters, 3–15.

Tucker, G. R., Lambert, W. E., & Rigault, A. A. (1977). *The French speaker's skill with grammatical gender: An example of rule-governed behavior*. The Hague: Mouton.

Tuller, L. (2000). Aspects de la morphosyntaxe du Français des sourds. *Recherches linguistiques à Vincennes*, *29*, 143–156.

Tuller, L., & Hamann, C. (2010). Relative clause production in French children and adolescents. *Language Acquisition: 17*.

Tuller, L., Delage, H., & Monjauze, C. (2011). Clitic pronoun production as a measure of typical language development in french: A comparative study of SLI, mild-to-moderate deafness and benign epilepsy of childhood with centrotemporal spikes. *Lingua*, *121*, 423-444.

Tuller, L., Henry, C., Sizaret, E., & Barthez, M.-A. (2012). Specific language impairment atadolescence: Avoiding complexity. *Applied Psycholinguistics*, 33, 161-184.

Unsworth, S. (2005). *Child L2, Adult L2, Child L1: Differences and similarities. A study on the acquisition of direct object scrambling in Dutch.* Doctoral dissertation. Utrecht University, Utrecht.

Unsworth, S. (2007). L1 and L2 acquisition between sentence and discourse: Comparing production and comprehension in child Dutch. *Lingua*, *117*, 1930-1958.

Unsworth, S. (2008). Age and input in the acquisition of grammatical gender in Dutch. *Second Language Research*, *24*, 365-396.

Vainikka, A., & Young-Scholten, M. (1996b). The early stages in adult L2 syntax: Additional evidence from Romance speakers. *Second Language Research*, *12*, 140-176.

Vainikka, A., & Young-Scholten, M. (1996a). Gradual development of L2 phrase structure. *Second Language Research*, *12*, 7-39.

Vainikka, A., & Young-Scholten, M. (1994). Direct access to X'-theory: Evidence from Korean and Turkish adults learning German. In T. Hoekstra & B. Schwartz (Eds.), *Language Acquisition Studies in Generative Grammar: Papers in Honor of Kenneth Wexler from the 1991 GLOW Workshops*. Amsterdam: John Benjamins Publishing Company.

van der Lely, H. K. J. (1998). SLI in children: Movement, economy and deficits in the computational-syntactic system. *Language Acquisition*, *7*, 161-192.

van der Lely, H. K. J. (2005). Grammatical-SLI and the computational grammatical complexity hypothesis. *Revue Frequences*, *17(3)*, 13-20.

van der Lely, H. K. J., & Battell, J. (2003). Wh-movement in children with grammatical SLI: A test of the RDDR Hypothesis. *Language*, *79*(1), 153-181.

van der Lely, H. K. J., Jones, M., & Marshall, C. (2010). Who did Buzz see someone? Grammaticality judgements of wh-questions in typically developing children and children with Grammatical-SLI. *Lingua. Special issue on Wh-Questions for Celia Jakubowicz*.

Van der Velde, M. (2003). *Déterminants et pronoms en Néerlandais et en Français: Syntaxe et acquisition*. Doctoral dissertation. Université Paris 8, Paris.

Van Kampen, J. (1997). *First steps in Wh-movement.* Doctoral dissertation. University of Utrecht, Utrecht.

Weber-Fox, C., & Neville, H. (1996). Maturational constraints on functional specializations for language processing: ERP and behavioral evidence in bilingual speakers. *Journal of Cognitive Neuroscience*, *8*(3), 231-256.

Wechsler, D. (2003). *Wechsler Intelligence Scale for Children—4th Edition (WISC-IV®)*. San Antonio, TX: Harcourt Assessment.

Weerman, F., Bisschop, J., & Punt, L. (2006). L1 and L2 acquisition of Dutch adjectivalinflection. *ACLC Working Papers*, *1*, 5-36.

Weissenborn, J. (1990). Functional categories and verb movement: The acquisition of German syntax reconsidered. *Linguistische Berichte*, 190-224.

Wexler, K. (1994). Optional infinitives, head movement, and the economy of derivation in child language. In D. Lightfoot & N. Hornstein (Eds.), *Verb Movement* (pp. 305-350). Cambridge, UK: Cambridge University Press.

Wexler, K. (1998). Very early parameter setting and the unique checking constraint: A new explanation of the optional infinitive stage. *Lingua*, *106*, 23-79.

Wexler, K. (2002). Lenneberg's dream: Learning, normal language development and specific language impairment. In J. Schaeffer & Y. Levy (Eds.), *Language competence across populations: Towards a definition of Specific Language Impairment*. Lawrence Erlbaum Associates.

Wexler, K. (2003). Lenneberg's dream: Learning, normal language development, and specific language impairment. In Y. Levy & J. Schaeffer (Eds.), *Language Competence Across Populations: Towards a Definition of Specific Language Impairment* (pp. 11–62). Mahwah, NJ: Lawrence Erlbaum Associates.

White, L. (1996). Clitics in L2 French. In H. Clahsen (Ed.), *Generative perspectives on language acquisition* (pp. 335-367). John Benjamins Publishing Company.

White, L. (2000). Second language acquisition: From initial to final state. In J. Archibald (Ed.), *Second language acquisition and linguistic theory* (pp. 130-155). Blackwell.

White, L. (2003). *Second language acquisition and universal grammar*. Cambridge, UK: Cambridge University Press.

White, L., & Genesee, F. (1996). How native is near-native? The issue of ultimate attainment in second language acquisition. *Second Language Research*, *12*, 238-265.

White, L., Valenzuela, E., Macgregor, M., Leung, I., & Ben Ayed, H. (2001). The status of abstract features in interlanguage grammars: Gender and number in L2 Spanish. *Proceedings of the 25th Annual Boston University* (pp. 792-802). Presented at the Conference on Language Development, Somerville, MA: Cascadilla Press.

Wiig, E. H., Secord, W. A., & Semel, E. (2004). *Clinical evaluation of language fundamentals - Preschool, second edition*. San Antonio, TX: Harcourt Assessment.

World Health Organization. (1992). *The ICD-10 classification of mental and behavioral disorders. Clinical description and diagnostic guidelines* (10th ed.). Geneva: WHO.

Zebib, R. (2009). *Le rôle de l'apprentissage de la lecture dans le développement de la mémoire de travail*. Doctoral dissertation. Rabelais University, Tours.

Zesiger, P., Zesiger, L. C., Arabatzi, M., Baranzini, L., Cronel-Ohayon, S., Franck, J., Frauenfelder, U. H., et al. (2010). The acquisition of pronouns by French children: A parallel study of production and comprehension. *Applied Psycholinguistics*, *31*(04), 571-603.

Zhang, X. (1999). Words processing in Cantonese-Putonghua machine translation. *Journal of Chinese Information Processing*, *3*(13), 40-47.

Zribi-Hertz, A. (1994). La syntaxe des clitiques nominatifs en français standard et en français avancé. Travaux de linguistique et de philologie 32, 131–147.

Zuckerman, S. (2001). *The acquisition of "optional" movement.* Doctoral dissertation. University of Groningen, Groningen.

Annexes

Annexe A Initial Language Profile

Language Profile

(Please fill out a separate form for each of your children.)

The objective of this questionnaire is to gather information about your child's experience with language. All information will remain confidential.

- Name: ____ Age: _______________________
- School: ____ Class: _____________________
- Sex:
- Date of Birth: ____
- Place of Birth: ____
- Date at which the child arrived in France _____________________________________
- What is (are) the child's first language(s)? ___________________________________
- What is the first language of:

  - the mother? _______________________________________

  - the father? _______________________________________

- Did the child learn his/her first language(s) from birth? Yes No

  If you answered 'No', please explain:

  ____

- In which language(s) has the child received formal education? Where (i.e. country)?

  Primary/Elementary school____

- Which language(s) does the child use:

  At home____

  In social situations____

	Second Languages (Specify)	
	French	**Other 2nd language : _______**
At what age did the child begin to learn his/her 2nd language?		
At what age did he/she first use it to communicate?		
Where did the child learn his/her 2nd language?		
Has the child ever spent time in an area where this language was native language (prior to the arrival in France)?	Where? How long?	Where? How long?
Where does the child use this language?	School Home Social Situations	School Home Social Situations
Approximately how many hours a week does the child use t language?		
Is the child currently attending a school where the language of instruction is the second language? If so, where and how long has the child been instructed in that language ?		

Annexe B Family Questionnaire

Family questionnaire

The objective of this questionnaire is to gather information about your child and your family. All information will remain strictly confidential.

Name of the person(s) who filled in this questionnaire: ________________________________

A. Your child (the one participating in the study). Please fill out a separate questionnaire for each child participating in the study.

- Name: ______________________________ Birth date: _______________________________
- Is your child left-handed or right-handed?
- Schooling in France:

  - Date of entrance into the French school system: Month _____________Year ___________
  - Year/level (/grade) of entrance into the French school system (CP, CE1, CE2, etc.):________
  - Current year/level (/grade) (CP, CE1, CE2, etc.): _______________
- Use of English:

Where, and how often, does your child use English?

At school?	all the time	most of the time	often	sometimes	rarely	never
At home?	all the time	most of the time	often	sometimes	rarely	never
With playmates?	all the time	most of the time	often	sometimes	rarely	never
With family friends?	all the time	most of the time	often	sometimes	rarely	never
With relatives?	all the time	most of the time	often	sometimes	rarely	never

Comments:

____

Is English used

between your child and his/her mother?

all the time most of the time often sometimes rarely never

Comments:____

between your child and his/her father?

all the time most of the time often sometimes rarely never

Comments: ____

between your child and his/her brother(s) and sister(s)?

all the time most of the time often sometimes rarely never

Comments: ____

Does your child watch television/DVDs in English?

all the time most of the time often sometimes rarely never

Comments: ____

Does your child read books in English?

all the time most of the time often sometimes rarely never

Comments: ____

Do you have English-speaking visitors in your home (relatives, friends)?

all the time most of the time often sometimes rarely never

Comments: ____

Does your child ever spend time (ex. vacations) in an English-speaking country?

all the time most of the time often sometimes rarely never

Comments: ____

Approximately how many hours a week does your child use English?

Never. Less than 10 hours per week. 10 to 20 hours per week. 20 to 30 hours per week.

30 to 40 hours per week. 40 to 50 hours per week.

- Difficulties with language:

	In English	In French
Has your child had difficulties at school in any of the following areas? If so, at what age?	No Yes. Age Reading ___________ Spelling ___________ Maths _____________	No Yes. Age Reading ___________ Spelling ___________ Maths _____________
Has your child repeated a class? If so, which one(s)?	No Yes. Age: ___________	No Yes: __________
Has your child ever suffered from any hearing loss? If so at what age?	No Yes. Age: ___________ Comments: __________________	No Yes. Age: ___________ Comments: __________________
Has your child been followed by a speech therapist or any other language specialist?	No Yes. Age: ____ to age:_____ For spoken language For reading/written language I don't remember what for I don't know	No Yes. Age: ____ to age:_____ For spoken language For reading/written language I don't remember what for I don't know
Is there any other relevant information about your child's experience with language learning (such as stuttering; lisping; difficulties producing long words, such as *hippopotamus*; difficulties following a long story; difficulties with oral speech, such as finding his/her words or making himself/herself understood, etc.)?		

B. His/her brothers and sisters

How many other children are there in your family? __________________

Does your child have a twin/triplet? No Yes (identical non-identical)
Please fill in the following chart about your child's brothers and sisters:

	Sibling 1	Sibling 2	Sibling 3	Sibling 4	Sibling 5	Sibling 6
Gender	F M	F M	F M	F M	F M	F M
Birth date						
Right-handed or left-handed?						
Current grade in school						
Difficulties at school (maths, spelling, reading, repeating a grade, etc.)?						
Followed by a speech therapist or any other specialist of spoken or written language? (Specify English or French.)						
Difficulties expressing himself/herself in English?						
Difficulties understanding English?						
Stuttering in English?						
Any other information that may seem relevant?						

C. You (the parents)

- Occupation:

  - Mother: ____

  - Father: ____

- Level of schooling completed

  - Mother: secondary undergraduate degree postgraduate degree other: ___________

  - Father: secondary undergraduate degree postgraduate degree other: ___________

- How well do you and your spouse speak French?

  -Mother: fluent gets along well gets along with difficulty very little French only a few words/phrases not at all.

  -Father: fluent gets along well gets along with difficulty very little French only a few words/phrases not at all.

- Please specify any language difficulties you and/or your spouse may have encountered (in English):

	Mother	Father
Difficulties at school (maths, spelling, reading, repeating a grade, etc.)?		
Followed by a speech therapist or any other specialist of spoken or written language?		
Difficulties expressing yourself?		
Difficulties understanding?		
Stuttering?		
Right-handed or left-handed?		
Any other information that may seem relevant?		

Maureen SCHEIDNES

L'acquisition du français L2 chez l'enfant : Développement typique versus atypique

Résumé

La comparaison des enfants qui acquièrent une langue seconde (L2) à des enfants avec trouble spécifique du langage (TSL) a montré des similarités entre les performances morphosyntaxiques des deux groupes. Cette étude vise à mieux comprendre l'acquisition L2 enfantine typique afin de permettre l'identification d'un TSL chez les enfants L2. Une étude longitudinale de taux de propositions enchâssées et d'erreurs ont été a été faite à partir d'échantillons de langage spontané en français de 22 enfants anglophones âgés de 6;9-12;7 et de 19 enfants monolingues francophones avec TSL âgés de 6;5 à 12;11. Les résultats révèlent que les L2 font plus d'enchâssées que les enfants avec SLI, mais les deux groupes ont eu des taux d'erreurs comparables. La discussion porte sur l'implication de ces résultats sur l'identification des TSL chez les enfants L2.

Mots clés: acquisition L2 enfantine, TSL, enchâssement, diagnostic différentiel

Résumé en anglais

Research on children acquiring a second language (L2 children) and children with SLI has revealed similarities in their morphosyntactic performance. This study seeks to better understand how children acquire an L2 in order to distinguish typical from atypical L2 acquisition. A longitudinal study of clausal embedding and error rates was made based on spontaneous language samples of 22 English-speaking children (aged 6;9-12;7) acquiring French as an L2 and 19 monolingual French-speaking children with SLI (aged 6;5-12;11). The results revealed that L2 children used clausal embedding more often than the children with SLI, but the SLI and L2 had similar error rates. Analyses of the frequency of embedding and errors revealed correlations that were positive in the L2 group and negative in the SLI. The discussion focuses on the implications of these findings for the identification of SLI in L2 children.

Keywords: child L2 acquisition, SLI, clausal embedding, morphosyntactic accuracy